UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2023

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to

Commission File Number 001-39334

BIORA THERAPEUTICS, INC.

(Exact name of registrant as specified in its charter)

Delaware	**27-3950390**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
4330 La Jolla Village Drive, Suite 300, San Diego, CA	**92122**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (833) 727-2841

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Common Stock, par value $0.001 per share	BIOR	The Nasdaq Global Market

Securities registered pursuant to Section 12(g) of the Act: **None**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES ☐ NO ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. YES ☐ NO ☒

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES ☒ NO ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). YES ☒ NO ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
Emerging growth company	☒		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☐

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). YES ☐ NO ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant, based on the closing price of the shares of common stock on The Nasdaq Stock Market on June 30, 2023, was approximately $38,960,310.

The number of shares of registrant's Common Stock outstanding as of March 20, 2024 was 30,313,428.

DOCUMENTS INCORPORATED BY REFERENCE

None

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EXPLANATORY NOTE

All share and per share information included in this Annual Report on Form 10-K has been retroactively adjusted to reflect a 1-for-25 reverse stock split effected on January 3, 2023.

TRADEMARKS

Biora Therapeutics™, BioJet™, NaviCap™, and GItrac™ are trademarks of Biora Therapeutics, Inc. Any other brand names or trademarks appearing in this Annual Report on Form 10-K are the property of their respective holders.

FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K ("Annual Report") contains “forward-looking statements” within the meaning of the federal securities laws, which statements involve substantial risks and uncertainties and are based on estimates and assumptions. All statements, other than statements of historical facts included in this Annual Report, including statements concerning our plans, objectives, goals, strategies, future events, future revenues or performance, financing needs, plans or intentions relating to products and markets, and business trends and other information referred to under “Risk Factors,” “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and “Business,” are forward-looking statements. In some cases, you can identify forward-looking statements by terms such as “may,” “might,” “will,” “objective,” “intend,” “should,” “could,” “can,” “would,” “expect,” “believe,” “design,” “estimate,” “predict,” “potential,” “plan,” “anticipate,” “target,” “forecast” or the negative of these terms, and similar expressions intended to identify forward-looking statements. Forward-looking statements are not historical facts, and reflect our current views with respect to future events. Given the significant uncertainties, you should not place undue reliance on these forward-looking statements.

There are a number of risks, uncertainties, and other factors that could cause our actual results to differ materially from the forward-looking statements expressed or implied in this Annual Report. Such risks, uncertainties, and other factors include, among others, the following risks, uncertainties, and factors:

- our plans and ability to continue operations in view of our limited capital resources as disclosed in this Annual Report and our ability to maintain compliance with the continued listing requirements of the Nasdaq Global Market ("Nasdaq");
- the beneficial characteristics, safety, efficacy and therapeutic effects of our product candidates;
- our plans and ability to successfully research, develop and commercialize new products and product candidates;
- the success, cost and timing of our preclinical and clinical development activities and planned clinical trials;
- the size and growth potential of the markets for our products under development, and our ability to serve those markets;
- the rate and degree of market acceptance and clinical utility of our product candidates under development, if approved;
- coverage and reimbursement for our products under development;
- the performance of third parties in connection with the development of our products under development, including third-party contract research organizations and suppliers;
- regulatory developments in the United States and foreign countries;
- our ability to obtain and maintain regulatory approval or clearance of our products under development on expected timelines;
- the development, regulatory approval, efficacy, and commercialization of competing products;
- the outcome of pending legal proceedings;
- the loss or retirement of key scientific or management personnel;
- our ability to develop and maintain our corporate infrastructure, including maintaining effective internal controls;
- our estimates regarding expenses, future revenue, capital requirements, and needs for additional financing; and
- our expectations regarding our ability to obtain and maintain intellectual property protection for our products, as well as our ability to operate our business without infringing the intellectual property rights of others.

There may be other factors that cause our actual results to differ materially from the forward-looking statements expressed or implied in this Annual Report, including factors disclosed in the sections of this prospectus entitled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and elsewhere. You should evaluate all forward-looking statements made in this prospectus in the context of these risks and uncertainties.

We caution you that the risks, uncertainties and other factors referred to above and elsewhere in this prospectus may not contain all of the risks, uncertainties, and other factors that may affect our future results and operations. Moreover, new risks will emerge from time to time. It is not possible for our management to predict all risks. In addition, we cannot assure you that we will realize the results, benefits, or developments that we expect or anticipate or, even if substantially realized, that they will result in the consequences or affect us or our business in the way expected.

All forward-looking statements in this Annual Report apply only as of the date made and are expressly qualified in their entirety by the cautionary statements included in this Annual Report. Except as required by law, we disclaim any intent to publicly update or revise any forward-looking statements to reflect subsequent events or circumstances.

PART I

In this Annual Report, "Biora," "Biora Therapeutics," "we," "us" and "our" refer to Biora Therapeutics, Inc., and our wholly-owned subsidiaries on a consolidated basis, unless the context otherwise provides.

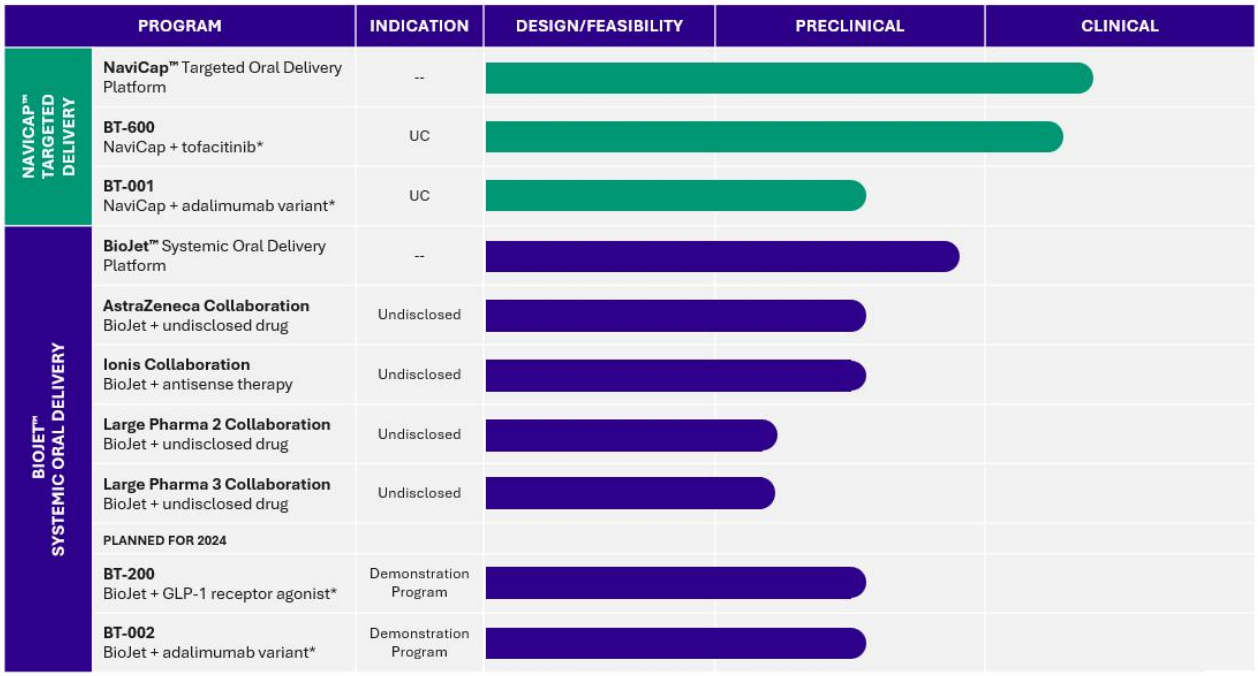
Item 1. Business.

Overview

Biora Therapeutics, Inc. is a clinical-stage biotechnology company developing oral biotherapeutics that could enable new treatment approaches in the delivery of therapeutics. Our pipeline includes two therapeutic delivery platforms:

- **NaviCap™ Targeted Oral Delivery Platform**: Delivery of therapeutics to the site of disease in the gastrointestinal ("GI") tract designed to improve outcomes for patients with inflammatory bowel disease ("IBD"); and
- **BioJet™ Systemic Oral Delivery Platform**: Designed to replace injection with needle-free, oral delivery of large molecules for better management of chronic diseases.

Our mission is to reimagine therapeutics and their delivery. By creating innovative smart pills designed for targeted drug delivery to the GI tract and systemic, needle-free delivery of biotherapeutics, we are developing therapies intended to improve patients' lives. Our therapeutic pipeline is shown below.



*Biora's own molecules

NaviCap™ Targeted Oral Delivery Platform

Overview

Our NaviCap platform is an ingestible smart capsule designed to deliver drugs to the site of disease in the GI tract to improve treatment of IBD. The NaviCap platform utilizes a novel therapeutic approach that is designed to overcome the limitations of current treatments by maximizing the available dose at the site of disease while reducing systemic toxicity.

Using this platform, we are developing a pipeline of investigational drug-device combinations that utilize an ingestible smart capsule for targeted delivery of therapeutics in the GI tract. We have two programs, BT-600 (NaviCap + tofacitinib) and BT-001 (NaviCap + variant of adalimumab). Both tofacitinib and adalimumab have been approved for the treatment of ulcerative colitis ("UC"), a type of

IBD, but are dose limited by safety concerns at higher doses. Existing research, including research we have generated, suggests that efficacy may be limited by insufficient drug reaching diseased tissue in the colon.

We believe our technology has the potential to:

(1) achieve sufficient therapeutic amounts of these drugs through local delivery to the site of inflammation in the GI tract, potentially improving outcomes for patients suffering from UC;

(2) enable administration of lower doses of drug, potentially reducing the severe adverse event profiles seen with some of these therapeutics; and

(3) enable the use of combination therapy in IBD, by reducing systemic drug exposure and improving safety, in order to target multiple pathways of disease.

Unmet Need

Inflammatory Bowel Disease

IBD is a heterogeneous group of inflammatory disorders of the GI tract, and broadly includes two major disorders: Crohn's disease and UC. According to the Crohn's & Colitis Foundation ("CCF"), there are approximately 1.6 million Americans affected by IBD. The disease typically has an onset before 30 years of age and is a lifelong illness that can be potentially life-threatening. The immune system, which normally protects the body from external invaders like bacteria and viruses, becomes dysregulated in patients with IBD, causing the immune system to attack the body's own tissues. Although IBD has no known cause, there is strong evidence that genetics, a dysregulated immune system, the environment and the gut microbiome all play a role initially in causing the disease and then in perpetuating the inflammation.

The goal of medical treatment for all forms of IBD is to reduce the inflammation and induce remission initially with medication, followed by the administration of maintenance medication to prevent a relapse of the disease. We estimate the IBD therapeutics market to be in excess of $15 billion.

Ulcerative Colitis

The CCF estimates that UC affects nearly one million Americans. UC is characterized by inflammation and ulceration of the mucosal lining of the colon. The typical symptoms include diarrhea, bleeding and abdominal pain. In more severe cases, there can be large amounts of blood loss, which can be life-threatening and may require emergency surgery.

Treatment for UC depends on the severity of the disease, complications, and response to previous treatment. Most patients with mild to moderate UC will first be treated with aminosalicylates. For patients with moderate to severe UC who do not respond to aminosalicylates, more potent systemic therapies such as infliximab and adalimumab are used. Despite multiple therapeutics being approved for UC that work through a range of mechanisms, outcomes for these patients remain poor, with few patients achieving long-term remission. Data suggests that only 15 to 30% of patients achieve remission of symptoms after induction with any drug therapy.

Many of these therapies have side effects that limit dosing, which leads to insufficient drug levels in diseased tissue. There is growing data that suggests the amount of drug in tissue is a key driver of patient outcomes. For anti-TNF-alphas such as infliximab and adalimumab, clinical studies have shown that the tissue TNF-alpha level far exceeds the amount of drug reaching the actively inflamed tissue in patients with active IBD.

We believe that current approaches to drug delivery are inadequate to suppress the inflammatory response. In conjunction with our academic collaborators, we presented compelling evidence to support the importance of drug levels in tissue at the 17th Congress of the European Crohn's and Colitis Organization and at the 34th edition of the Belgian Week of Gastroenterology. Material presented included data from patients with moderate to severe UC taking commercial formulations of tofacitinib. GI tissue biopsies were obtained from these patients, which identified a clear correlation between higher concentrations of drug in the tissue and improved outcomes.

NaviCap Targeted Oral Delivery Device

The NaviCap device is an investigational, clinical-stage, single-use ingestible device that has a drug capacity of up to 500µL with an outer casing made of inert material. The device is approximately the size of a fish-oil capsule and is rounded for ease of swallowing. Once swallowed, the device is designed to autonomously identify specific locations in the GI tract and release a therapeutic dose at a determined location that can act locally in the GI tract, thereby potentially limiting systemic absorption and the associated toxicity effects.

NaviCap device

GItrac™ Autonomous Location Technology

The NaviCap device incorporates our GItrac autonomous location technology, which is designed to autonomously identify the ileal/ileocecal region of the GI tract and deliver medication to that region. GItrac is based on a proprietary LED light and photodetector sensor array that detects reflected light within the GI tract and uses a proprietary algorithm to determine anatomical locations of interest, such as the pyloric and ileocecal transition. GItrac differs from other GI tract localization technologies that rely on pH levels and other physiological factors, which are not specific and are highly variable, especially in patients with IBD.

Clinical Device Function Studies

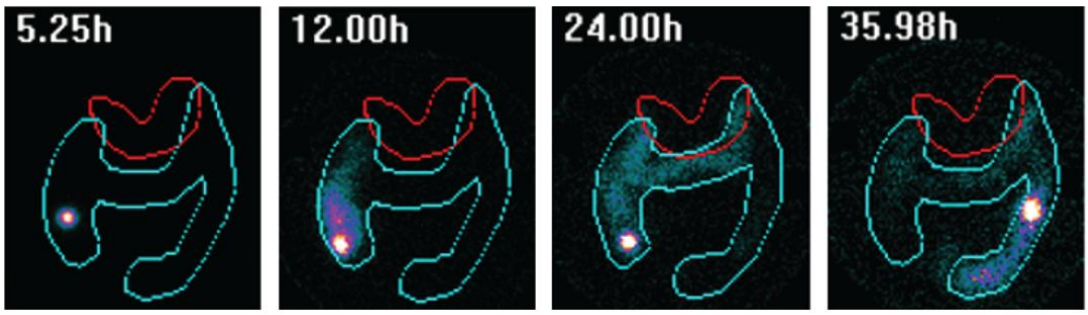
We have conducted four separate clinical device function studies to evaluate the function of the NaviCap device in humans, with approximately 50 study participants receiving over 80 NaviCap devices. The NaviCap device has demonstrated a favorable safety profile and high accuracy rate in identifying entry into the colon in both normal healthy volunteers and in patients with active UC.

PM-601 Device function study in healthy volunteers in a fasted state

We conducted a clinical device function study to evaluate the safety and tolerability of the device as well as the ability to identify entry into the colon and release payload. In the study, 12 normal healthy volunteers were enrolled and administered a single NaviCap device loaded with a radioisotope that can be imaged with sequential gamma scintigraphy. Imaging was correlated with data recovered from the device to confirm time of detection of entry into the colon and release of the radioisotope. The results of the study demonstrated that the device was well tolerated and 10/12 (83%) of devices accurately identified entry into the colon.

PM-602 Device function study in patients with active UC

In this clinical device function study, we evaluated whether the NaviCap device can accurately identify entry to the colon, activate and release a payload in patients with active UC, which presents a challenging environment of inflammation, bleeding and highly variable motility. The NaviCap device was ingested orally, and after localization, released a payload that included radioisotopes. Scintigraphic imaging was used to evaluate device localization and payload delivery to the large intestine. Study results demonstrated that the device was well tolerated and performed as intended in active UC patients. All devices (7/7) accurately identified entry into the colon, triggered release of its liquid payload and achieved distribution across the colon. The scintigraphic images below are taken from a subject in the study. They demonstrate release in the first part of the colon and eventual distribution of the radioisotope to the entire colon. This study was funded in part by the CCF.



PM-611 Device function study in healthy volunteers – fasted and fed

In this clinical device function study, we evaluated whether the NaviCap device is impacted by food, potentially enabling non-fasted administration. Results of the study demonstrated that the NaviCap device was well tolerated and functioned as intended in healthy volunteers using four different fasted/fed dosing schedules. All analyzed devices (39/39) successfully identified entry to the colon in all fasted/fed schedules, and 97.4% of analyzed devices (38/39) activated the payload release function. This study confirmed that the potential effect of food on the function of the NaviCap device is minimal.

BT-603 Device function study in healthy volunteers – fasted state

In this clinical device function study, we evaluated the performance in healthy volunteers of the NaviCap device that we intend to use in a Phase 1 trial using scintigraphic imaging. Results indicated that 94% of devices (15/16) accurately identified entry into the colon, triggered release of its liquid payload, and achieved distribution across the entire colon.

NaviCap Programs

BT-600 Liquid formulation of tofacitinib delivered via NaviCap for the treatment of ulcerative colitis

Our lead program for the NaviCap platform is BT-600 (formerly known as PGN-600). We are developing BT-600 as a drug-device combination product that includes an orally delivered liquid formulation of tofacitinib for the treatment of UC. Tofacitinib is approved for the treatment of UC and is dose-limited based on safety concerns, making it an ideal therapy for targeted delivery.

Clinical Trials

In 2023, we submitted an Investigational New Drug (IND) application for BT-600 to the U.S. Food and Drug Administration ("FDA"), and the FDA cleared our IND application in late 2023. In January 2024, we initiated a Phase 1 trial of BT-600 in healthy volunteers.

The objectives of this Phase 1 randomized, double-blind, placebo-controlled, single and multiple ascending dose clinical trial are to evaluate the safety, pharmacokinetics ("PK") and pharmacodynamics, including effects on colon tissue, of BT-600 when administered orally in healthy adult volunteers. The trial, which is being conducted in the United States, consists of two parts. The first is a single-dose ascending cohort comprised of 24 participants receiving BT-600 with tofacitinib at 5 mg and 10 mg doses or placebo. The second is a multiple-dose ascending cohort comprised of 24 participants receiving BT-600 with tofacitinib at 5 mg and 10 mg doses or placebo.

The clinical trial is currently in progress, and results will be presented upon completion of the trial. The single ascending dose cohort was completed in February 2024, and we shared key results from the interim analysis in the Company's 8-K filed on March 26, 2024. Based on what has been observed preclinically, we anticipate increased colonic tissue drug levels and reduced systemic levels compared with conventional oral tofacitinib. Given the known efficacy of the currently approved doses of tofacitinib, BT-600 has the potential to improve the management of UC in patients.

Preclinical Studies

Our data generated in animal models of colitis demonstrated that tofacitinib delivered directly to the colon can lead to significantly higher colon tissue concentrations than equivalent standard oral doses. We conducted a preclinical study of BT-600 in a canine model comparing seven-day daily administration of 10 mg standard oral tablet formulation of tofacitinib to 10 mg of liquid formulation of tofacitinib delivered via the NaviCap device. We evaluated mean concentration of tofacitinib in tissues at day seven and systemic tofacitinib levels by area under the curve at days one and six.

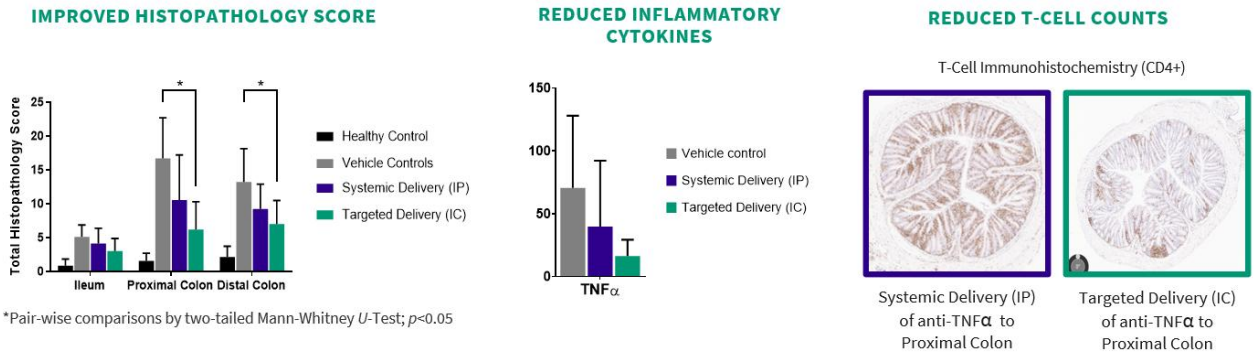
Results of the study demonstrated that BT-600 was well tolerated with a favorable safety profile and that when tofacitinib was delivered to the colon, drug levels in blood were reduced compared to oral tofacitinib tablets. In addition, tissue drug levels were at least 25 times higher along the length of the colon compared to oral tofacitinib tablets. We believe these results indicate that BT-600 has the potential to increase local tissue concentrations of tofacitinib while reducing systemic drug levels, which could lead to a safer and more efficacious treatment.

To support our IND filing for BT-600, we subsequently completed a 14-day preclinical toxicology study of BT-600 in a canine model comparing 14-day daily administration of 10 mg of liquid formulation of tofacitinib delivered via NaviCap (BT-600) versus placebo delivered via NaviCap. Over 600 devices were administered and no safety signals were observed.

BT-001 Liquid formulation of Anti-TNF-alpha monoclonal antibody delivered via NaviCap for the treatment of ulcerative colitis

We are developing BT-001 (formerly known as PGN-001) as an orally delivered variant of adalimumab for the treatment of UC. Multiple anti-TNF-alpha targeting therapies have been approved for UC, but data suggests patients may not have enough drug in the tissue to engage the target, TNF-alpha, and reduce inflammation. We have conducted a series of preclinical studies demonstrating the potential of locally delivered anti-TNF-alpha antibodies to reduce disease burden in UC models.

We conducted a study in an adoptive T cell transfer model of colitis in mice and compared an anti-TNF-alpha delivered by intraperitoneal ("IP") injection every three days to daily delivery directly to the colon by intracecal ("IC") catheter. We also compared treatment naïve animals and vehicle controls. Treatment duration was 42 days and, at day 42, blood and tissues were collected for bioanalysis of inflammatory cytokines and tissues were fixed for histopathologic analysis. The results are presented in the graphs below.



Results of the study demonstrate significant reduction in mean concentration of inflammatory cytokines in groups treated with anti-TNF-alpha by IC or IP route when compared with vehicle control (IP and IC) in colon tissue. Targeted IC anti-TNFα treatment showed a significant improvement in mean histopathologic score when compared with the vehicle controls (IP and IC) groups in proximal and distal colon tissues, indicating that anti-TNF-alpha treatment was generally more effective in this group. Targeted IC anti-TNF-alpha treatment showed the greatest magnitude of lymphocyte reductions when compared with vehicle control groups. We believe this study supports the potential efficacy of locally delivered anti-TNF-alpha antibodies and BT-001.

BT-001 is currently in preclinical-stage development with an anti-TNF-alpha antibody formulation that we have developed and scaled to Good Manufacturing Practice ("GMP")-grade material.

BioJet Systemic Oral Delivery Platform

The BioJet systemic oral delivery platform is a novel platform for needle-free delivery of therapeutics that would otherwise require injection. Biora's novel approach to oral delivery of large molecules uses an ingestible capsule designed for needle-free, liquid jet injection of a liquid drug formulation into the tissue of the small intestine where it can be absorbed systemically.

The BioJet platform includes drug-device combination programs designed to achieve systemic bioavailability and replace injection for better management of chronic diseases. This technology has the potential to deliver a range of molecules, including proteins, peptides, and nucleic acids.

We believe oral, systemic delivery of large molecules has the potential to:

(1) improve patient convenience and therefore patient compliance through the more desirable oral route of administration, thus improving healthcare outcomes;

(2) improve drug efficacy and safety through more frequent administration of lower doses, compared to current weekly or monthly injection regimens; and

(3) help biotherapeutics become more competitive with small molecules, expanding the market for these drugs across a range of chronic use indications.

Unmet Need

Over the past two decades, biologic drugs have become the standard of care for a variety of diseases, including rheumatoid arthritis, psoriasis, diabetes, obesity, Crohn's disease, UC and a range of cancers. To reduce injections, many biologics have been developed for less frequent dosing, such as weekly or monthly injections; however, this means larger amounts of the drug are in circulation, which can lead to safety concerns. This also means that before the next dose, drug levels can drop lower than desired, potentially impacting efficacy. An ideal dosing regimen may be a more frequent dosing schedule, such as daily, to maintain drug levels within a smaller window that is optimal for safety and efficacy.

There is also significant aversion to injections among patients, with approximately 20% of adults affected by fear of needles and overall strong patient and physician preference for oral delivery of therapies as compared to injections. This aversion to painful injections affects compliance with therapy, which in turn impacts patient outcomes. For example, diabetes patients initiating treatment with an injectable glucagon-like-peptide 1 ("GLP-1") agonist reported 71% higher discontinuation rate as compared to those starting oral therapy and 42% of patients failed to maintain treatment due to injection concerns.

To date, efforts to deliver biologics orally have seen limited success. The primary mechanism has been chemical agents formulated with drugs that facilitate passage from the gut lumen into the GI tissue. These approaches achieve limited bioavailability, with less than 1% achieved in commercial products.

The BioJet Systemic Oral Delivery Device

The BioJet platform uses an ingestible device designed to transit through the digestive system and activate in the small intestine, where liquid jets deliver drug directly into small intestinal tissue for uptake into systemic circulation.

The BioJet device is a mechanical device that is designed for economical production at scale. The device is approximately the size of a multivitamin and is shaped like a standard capsule for ease of swallowing. It is made of an inert, biocompatible material with a liquid reservoir that can hold 300-400µL with low retained volume (less than 10µL), which protects the drug from stomach acids and proteolytic enzymes. The large payload provides the ability to dose in multi-milligram concentrations, and the use of liquid formulation reduces or eliminates the need for reformulation, making the platform broadly applicable to a wide range of molecules.

Upon reaching the small intestine, an enteric trigger degrades, activating the liquid jet formation and delivery. The device uses liquid jet delivery to deliver the liquid drug into the submucosal layer of the small intestine, where it can be rapidly taken up into systemic circulation.

BioJet Systemic Oral Delivery Device

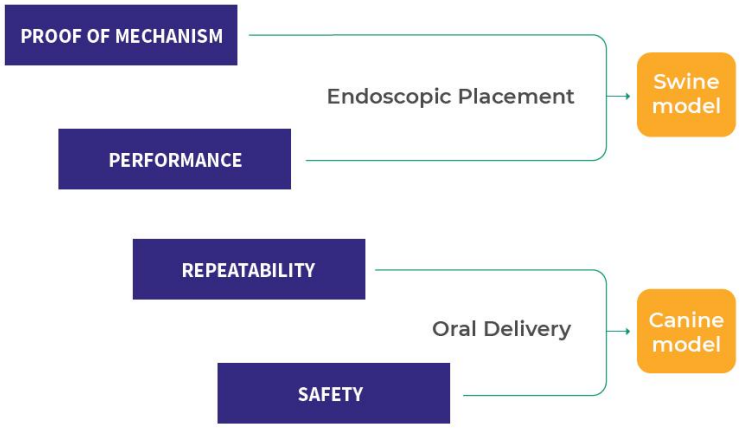
Preclinical Model Selection for Translational Research

We utilize two different animal models for translational research with the BioJet platform: canine and swine.

Although the canine is a preferred model for oral therapeutic evaluation, anatomical differences between the canine and human small intestine make the canine model suboptimal for the evaluation of liquid jet injection to the small intestine (*e.g.*, determining drug bioavailability). Instead, due to the canine's similar GI transit and motility to human, its consistent and controllable gastric emptying, and the ease of oral dosing, the canine model is used specifically for evaluation of safety and oral delivery functionality, including consistency and repeatability.

A swine model was chosen to better represent the PK properties of submucosal injection in humans, due to its similar anatomical and histological features in the small intestine. The anatomy of the swine stomach requires endoscopic placement of the device, which, once released, can naturally transit, autonomously trigger and deploy.

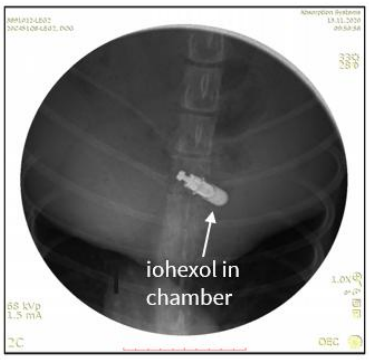
Our preclinical model selection is depicted in the diagram below.



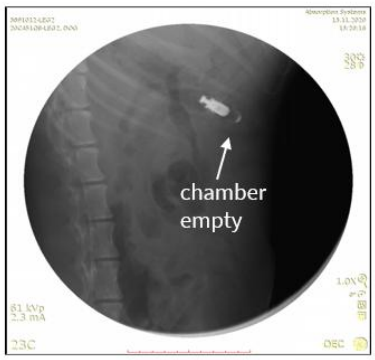
Preclinical Device Function Studies

In 2022, we conducted a preclinical study to evaluate the performance and assess the autonomous trigger function of the BioJet device in a canine model, which was presented as a poster at the Parenteral Drug Association Universe of Pre-Filled Syringes and Injection Devices Conference in October 2022. The study was a single-dose study evaluating safety and tolerability of the device in addition to the ability of the device to autonomously actuate in the small intestine. We evaluated device function by loading BioJet devices with a contrast agent (iohexal) and sequentially imaged post-administration as the device transited through the body to show device deployment time and location in the intestine.

This study demonstrated that the BioJet device can reliably deploy in the small intestine, which supports oral administration of the device. The images below are taken from the study and show the contrast agent inside the capsule in the stomach and after deployment in the small intestine.



Immediately after dosing in the stomach



After deployment in the small intestine

Research Collaborations

Our strategy is to partner with third parties to leverage their drug candidates and resources to help make the BioJet platform a leader in the oral delivery of biotherapeutics. We are currently engaged in multiple ongoing research collaborations with pharmaceutical

companies. As we advance development of the BioJet platform, we intend to expand our existing collaborations and pursue additional partnership opportunities with pharmaceutical companies.

AstraZeneca

We have an ongoing research collaboration with AstraZeneca, which was previously referred to as "Large Pharma 1." In January 2024, we announced that the BioJet platform met key performance milestones as part this research collaboration using AstraZeneca's undisclosed molecule. In a preclinical study, we assessed the bioavailability of the molecule when delivered via the BioJet platform in a porcine model, with comparison to subcutaneous administration. BioJet devices were administered endoscopically, which is typical in a porcine model, and released for autonomous actuation. The results met performance targets set by us and our collaborator of (i) greater than 25% bioavailability compared to subcutaneous delivery and (ii) less than 50% coefficient of variation.

Ionis Pharmaceuticals

We have been conducting preclinical research under a research collaboration agreement that provides funding to test the BioJet platform's ability to deliver antisense oligonucleotides. A key interest with this molecule type is the ability to demonstrate the potential of the BioJet platform to achieve uptake of large molecules into the liver. Many disease targets reside in the liver, and it is a key area of focus for RNA-based therapeutics, which include antisense oligonucelotides as well as siRNA-based therapeutics. These large molecules must typically be delivered via intravenous ("IV") or subcutaneous injection; however, the majority of the drug is metabolized before reaching the liver.

The BioJet platform uses liquid jet injection into the small intestine, which is an optimal delivery pathway to the liver, via the hepatic portal system. Results of this research, which have not been released, indicate the BioJet platform's potential to provide a unique advantage for liver-targeted, oral delivery of large molecules.

Other Research Collaborations

We also have research collaborations with two other undisclosed large pharmaceutical companies. We refer to these collaborators as Large Pharma 2 and Large Pharma 3. These research collaborations provide funding to test the BioJet platform's ability to achieve bioavailability through oral delivery of the collaborators' molecules via liquid jet delivery to the small intestine in animal models.

Demonstration Programs

We have two demonstration drug-device combination programs for the BioJet platform, BT-200 (GLP-1 receptor agonist) and BT-002 (adalimumab variant).

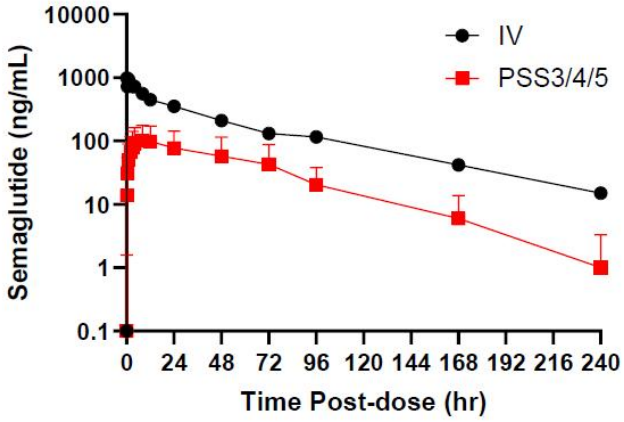
BT-200: Liquid formulation of a GLP-1 receptor agonist delivered via BioJet for the treatment of type 2 diabetes

We are developing BT-200 (formerly PGN-OB2) as a combination product of a GLP-1 receptor agonist and the BioJet device for the treatment of type 2 diabetes. GLP-1 receptor agonists stimulate insulin secretion and suppress glucagon release. We believe oral GLP-1 receptor agonists will be preferred by patients to injectables, resulting in a significant market opportunity.

In October 2023, we presented data at the European Association for the Study of Diabetes from three preclinical studies to assess the bioavailability of semaglutide when delivered via liquid jet technology in a porcine model. Semaglutide is a GLP-1 receptor agonist currently used to treat type 2 diabetes and for weight management via subcutaneous injection or taken orally. The studies included single, approximately 1 mg doses of semaglutide in a liquid formulation delivered via the BioJet device. Devices were administered endoscopically, and then released for autonomous activation. Blood sampling was performed from zero to 240 hours post-dose, with comparison to a control animal with drug administered intravenously.

Across the three studies, 96% of animals showed semaglutide in systemic circulation at clinically relevant levels for up to ten days following administration. Among the 22 animals dosed with semaglutide, oral bioavailability averaged 20.5% ± 15.3%, compared to IV control.

The PK data obtained across the three studies (PSS3, PSS4, and PSS5) is shown compared to IV administration in the graph below.

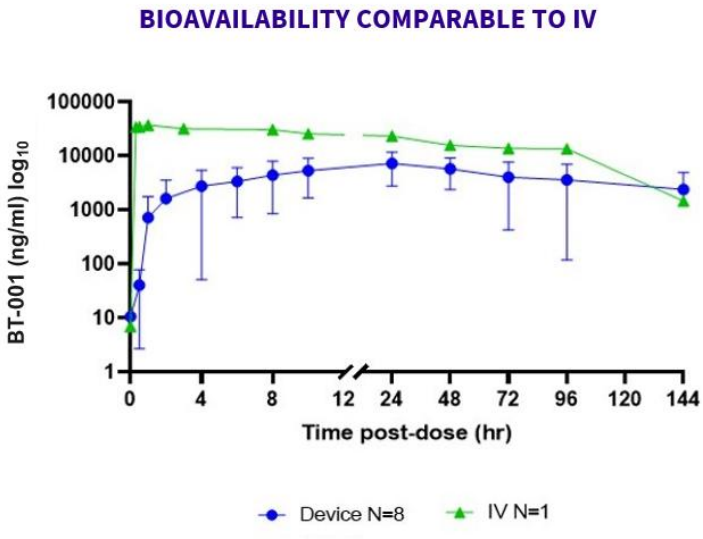


BT-002: Liquid formulation of adalimumab delivered via BioJet for the treatment of autoimmune conditions

We are developing BT-002 (formerly PGN-OB1) as a combination product of a variant of adalimumab and the BioJet device for the treatment of inflammatory conditions. Adalimumab is approved for a range of inflammatory disorders and generated over $18 billion in 2022 in annual sales, making it the best-selling drug globally. We estimate the market for monoclonal antibodies to be over $100 billion alone. An oral variant of adalimumab may represent a significant market opportunity due to the many patients who would like to avoid painful injections. BT-002 is currently in preclinical development with a liquid formulation of adalimumab that we have developed and scaled to GMP-grade material.

In February 2023, we announced preliminary results from a preclinical study for the BT-002 program, which assessed the bioavailability of a variant of adalimumab when delivered via BioJet liquid jet injection technology in a porcine model. Using the BioJet device, a single dose of 56 mg of a variant of adalimumab (a dose similar to those of subcutaneously administered monoclonal antibodies) was administered to a total of nine animals. The device was administered and activated endoscopically. Following administration, drug was detected in the blood in all animals with an average bioavailability of 51.3% and variability similar to that observed by others with subcutaneous injection. These results demonstrate the potential of our liquid jet delivery technology to perform comparably to subcutaneous injection.

The PK data obtained with BT-002 is illustrated in the graph below.



GI Sampling and Diagnostics

We have previously developed two additional ingestible devices focused on GI sampling and diagnostics. These platforms use our GItrac™ autonomous location technology, which is also part of the NaviCap platform, which is designed to autonomously identify key regions of the GI tract. GItrac is based on a proprietary LED light and photodetector sensor array that detects reflected light within the GI tract and uses a proprietary algorithm to determine anatomical locations of interest, such as the pyloric and ileocecal transition.

Our **Recoverable Sampling System** ("RSS") platform is an ingestible capsule designed to autonomously identify locations in the GI tract and collect and preserve a sample for analysis. This platform, if successfully developed, has the potential to analyze and characterize the GI tract. We have previously demonstrated the ability of the RSS to collect and preserve microbiome samples from within the GI tract of normal healthy volunteers.

Our **PIL Dx** platform is an ingestible capsule designed to sample, measure, and transmit results. This platform has the potential for on-board fluorescent assays measuring bacteria, proteins, and drugs, plus additional detection modalities. If successfully developed, the PIL Dx could address unmet healthcare needs by more precisely identifying and diagnosing chronic GI diseases like small intestinal bacterial overgrowth, IBD and non-alcoholic fatty liver disease.

The RSS and PIL Dx platforms are not in active development, but we may develop them in the future.

Competition

The biotechnology and pharmaceutical industries are characterized by rapid technological advancement, intense competition and a strong emphasis on intellectual property and proprietary products.

While we believe that our proprietary technologies, knowledge, experience, and scientific expertise provide us with competitive advantages, we face substantial competition from major pharmaceutical companies, biotechnology companies, academic institutions, government agencies, and public and private research institutions. For any products that we eventually commercialize, we will not only compete with existing technologies and therapies but also with those that may become available in the future.

Given our technology's potential utility across multiple applications, we expect to face intense competition from a diverse set of competitors. Many of our competitors, either alone or with strategic partners, have significantly greater financial, technical and human resources than we do. Competitors may also possess more experience developing, obtaining regulatory approval for, and marketing novel treatments and technologies in the areas we are pursuing. These factors could give our competitors an advantage in recruiting and retaining qualified personnel, developing similar or superior products, completing clinical development, securing strategic partnerships, and commercializing their products. We believe the key competitive factors that will affect the development and commercial success of our product candidates are efficacy, safety and tolerability profile, reliability, method of administration, convenience of dosing, price, reimbursement, patent protection and patents of our competitors.

NaviCap Platform Competition

The current IBD market is both established and mature, comprised of a range of therapeutic agents, including branded and generic small molecules, biologics and biosimilars, and involving multiple mechanisms of action as well as routes of administration. Although we believe our technology platform will provide us with a competitive advantage in its ability to enable targeted delivery of therapeutic agents via oral administration, we will face competition from several companies whose current research and development ("R&D") efforts will likely result in the emergence of newer pharmaceuticals touting oral administration, more convenient dosing frequency, novel mechanisms of action, and improved safety profiles and drug availability. We believe that the majority of competition will come from those companies marketing or developing biologics and small molecule therapeutics, including, but not limited to, AbbVie, Eli Lilly, Galapagos, Gilead, J&J, Pfizer, Protagonist, Roche, Takeda, and UCB.

BioJet Platform Therapeutics Competition

We expect to face competition from a number of technologies currently marketed or being developed to enhance or facilitate the oral administration of therapeutic agents. There is a wide range of competitive technologies and mechanisms that may challenge us, some of which are the subject of issued patents and pending patent applications, including issued patents and pending patent applications directed to ingestible devices for the oral administration of therapeutic agents.

The primary categories of oral biotherapeutic technologies currently available or being developed by our competitors include:

- Functional excipients designed to enhance the solubility and/or permeability of peptides and small molecules: Enteris Biopharma and Novo Nordisk;

- Enteric coating technologies designed to prevent gastric degradation of active pharmaceutical ingredients and facilitate GI delivery: Catalent, Cosmo Pharmaceuticals, Intract Pharma, Lonza, and Tillotts Pharma; and
- Ingestible devices designed for the delivery of a therapeutic payload: Novo Nordisk, Lyndra Therapeutics, Rani Therapeutics, Biograil, Eli Lilly and Amgen.

Our Strengths

Our business is built on a strong foundation designed to allow us to differentiate ourselves from potential competitors and drive the development of innovative platforms and product solutions.

Our strengths include:

- ***Breadth and depth of R&D capabilities driving breakthrough innovation***. We have built an in-house, first-class R&D organization capable of harnessing and translating novel technologies into innovative platforms and product solutions as we strive to remain at the forefront of patient needs. Our technical expertise along the product development spectrum includes medical device, therapeutics and diagnostic expertise, which enables us to leverage existing knowledge to solve new challenges. Our R&D team is comprised of over 35 full-time, experienced drug developers, engineers, researchers, manufacturers and innovators working to create solutions to improve patient outcomes. In addition to our full-time staff, our team is augmented by contract researchers, manufacturers, and consultants.
- ***Drug-device combination platforms targeting large, underserved markets***. We are developing multiple therapeutics with a platform approach based on innovative drug-device combinations, which could represent a paradigm shift from existing therapeutics approaches. We believe these platforms have the potential to address significant unmet medical needs.
- ***Comprehensive intellectual property portfolio***. We hold the rights to over 300 issued patents and pending patent applications that include claims that are directed to a range of therapeutic and device methods, systems, and compositions surrounding our suite of current and future products. In addition, we believe that our trade secrets and know-how provide additional barriers to entry to potential competitors.
- ***Proven leadership with industry expertise***. Our senior management team and board of directors consist of veteran biotechnology, drug development and commercialization, and healthcare professionals with deep industry experience. These individuals have extensive experience with numerous well-regarded biotechnology, pharmaceuticals, medical device and healthcare companies. Through their many years of experience, they have developed strong relationships with key thought leaders and medical societies.

Our Strategy

Our vision is to build upon our expertise and core competencies to transform biotherapeutic use and delivery. To realize our vision, we intend to:

- ***Focus on developing products that address the most critical needs of patients***. One of our primary goals as a company is to develop products that have the greatest impact on patients. We focus our R&D efforts on technologies that have the potential to disrupt current treatment paradigms and transform how healthcare is provided, thereby improving patients' lives. We intend to target diseases with large markets and where current treatments have limited efficacy and very high morbidity, such as IBD. In addition to prioritizing diseases with high unmet need, we will seek opportunities to increase market penetration, such as expanding the portion of the population that can be treated, because our targeted therapeutics may have lower systemic toxicity and may provoke lower immunogenicity.
- ***Develop and commercialize a disruptive pipeline of drug-device combination products***. Leveraging our novel technologies and platforms, we are developing drug-device combinations that address the unmet medical needs of patients with GI disorders and beyond. We believe our product candidates, if successfully developed and approved or cleared, could transform patient management. Ultimately, we intend to pursue commercialization of such product candidates ourselves or via strategic partnership.
- ***Opportunistic approach to drug candidate selection***. Using our platforms, we are developing potentially improved versions of existing drugs with established mechanisms of action. We intend to initially pursue only mature and approved drugs with expiring patents that we believe are biologically suited to address the target disease. We believe this strategy of starting with an approved therapeutic is core to operating in a scalable and capital-efficient manner. By starting with approved drugs with known mechanisms of action, we believe we can efficiently and cost-effectively evaluate opportunities that we believe are the most promising and very quickly discontinue programs that do not meet performance thresholds. We believe this will enable us to create sustainable and scalable platforms for development of multiple drug-device candidates.

- ***Leverage our robust R&D capabilities to drive breakthrough innovation***. We continually strive to innovate in ways that will allow us to disrupt current treatment paradigms. Through our robust R&D pipeline, we seek to unlock novel approaches in the oral delivery of biotherapeutics. Our drug-device combinations could enable new treatment paradigms in the areas of (1) delivery of therapeutics to the site of disease in the GI tract, which are designed to improve outcomes for patients with IBD, and (2) systemic delivery of biotherapeutics, which are designed to replace injection with needle free, oral capsules.
- ***Focus on maximizing value generation through partnerships and licensing***. Our strategy is to continue to develop our product candidates while simultaneously seeking out ways to monetize the assets during and after development. We initially target existing and well-known drugs that enable more rapid proof of concept and potentially abbreviated regulatory pathways. We intend to enter into additional collaborations and partnerships with pharmaceutical companies as part of our strategy to continue the development of our targeted and systemic drug delivery products.

Intellectual Property

The proprietary nature of, and intellectual property protection for, our products, processes, and know-how are important to our business. Our success depends in part on our ability to obtain patent and other legal protection for our products, technology, and trade secrets and know-how, to operate without infringing on the proprietary rights of others, and to prevent others from infringing on our proprietary rights. We rely on a combination of patents, trade secrets, know-how, license agreements, and nondisclosure and other contractual provisions to protect our intellectual property rights. These rights cover our proprietary technologies, processes, databases, information, and materials. We seek and maintain patent protection in the United States and internationally for our approximately 300 issued patents and pending patent applications, while also in-licensing technology, inventions, and improvements that we consider important to the success of our business. In addition to patent protection, we intend to use other means to protect our products, technology, and know-how, including pursuing terms of marketing or data exclusivity for our products, orphan drug status (if applicable) and similar rights that are available under regulatory provisions in certain territories, including the United States and Europe. We also rely on know-how and continuing technological innovation that are protected as trade secrets to develop and maintain our competitive position.

Drug-Device and Diagnostics Device Patent Portfolio

Intellectual property rights relating to our targeted and systemic therapeutics technologies and other ingestible device-enabled technologies include a patent portfolio consisting of approximately 70 distinct patent families comprising around 165 issued patents and approximately 135 pending applications. Of these patents and applications, the latest to expire issued U.S. patents are projected to expire in 2039 and the latest to expire U.S. patent applications, if and when issued, would be projected to expire in 2042, in each case, subject to potential term extensions. Twenty-four of the families were acquired in connection with the acquisition of certain tangible and intangible assets relating to the business formerly operated by Medimetrics GmbH, Medimetrics Personalized Drug Delivery B.V., and Medimetrics Personalized Drug Delivery Inc. In general, we file patent applications in the following patent jurisdictions: the United States, Australia, China, Canada, Europe, and Japan; and sometimes in these additional jurisdictions: Brazil, Eurasia, Hong Kong, Israel, India, South Korea, Mexico, and Singapore.

The patents and pending applications in this portfolio include claims that are directed to a range of gastroenterology-related and drug delivery methods, systems, and compositions, including but not limited to, the following:

- ingestible drug delivery mechanisms and systems for both topical and systemic delivery of therapeutics;
- ingestible devices for diagnosing, treating, and aiding in the treatment of GI diseases and conditions;
- GI-specific drug formulations and dosing regimens;
- autonomous localization of an ingestible device in the GI tract using visible or infrared light;
- treatment of GI-related and non-GI diseases and conditions using ingestible devices;
- GI sampling mechanisms and compositions, including preservatives for GI analytes; and
- ingestible device assays, optics and analytics for detecting and quantifying GI analytes.

Government Regulation

Regulations Related to Our Drug-Device Combination Product Candidate

Due to the variety of product candidates that we are developing, we and our product candidates will be subject to a wide variety of regulations promulgated by the FDA. Specifically, our product candidates are subject to regulation by the FDA's Center for Biologics Evaluation and Research, Center for Devices and Radiological Health and Center for Drug Evaluation and Research, as well as other

non-U.S. regulatory bodies (should we develop the product candidates and seek to obtain regulatory clearances or approvals to market outside of the United States). Certain of these applicable regulations are described below.

Medical Device Regulation

Pursuant to its authority under the Federal Food, Drug and Cosmetic Act (the "FD&C Act"), the FDA has jurisdiction over medical devices, including in-vitro diagnostics devices, and products we are currently developing or may develop in the future. The FDA regulates, among other things, the research, design, development, preclinical and clinical testing, manufacturing, safety, effectiveness, packaging, labeling, storage, recordkeeping, pre-market clearance or approval, adverse event reporting, marketing, promotion, sales, distribution and import and export of medical devices. Unless an exemption applies, each new or significantly modified medical device we seek to commercially distribute in the United States will require either a premarket notification to the FDA requesting permission for commercial distribution under Section 510(k) of the FD&C Act, also referred to as a 510(k) clearance, or FDA approval of a premarket approval application ("PMA"). We are developing certain ingestible product candidates that are subject to the FDA's premarket review requirements applicable to medical devices.

Device Classification

Under the FD&C Act, medical devices are classified into one of three classes—Class I, Class II or Class III—depending on the degree of risk associated with each medical device and the extent of control needed to provide reasonable assurances with respect to safety and effectiveness.

Class I includes devices with the lowest risk to the patient and are those for which safety and effectiveness can be reasonably assured by adherence to General Controls, which require compliance with the applicable portions of the FDA's Quality System Regulation ("QSR"), facility registration and product listing, reporting of adverse events and malfunctions, and appropriate, truthful and non-misleading labeling and promotional materials. Some Class I devices also require premarket clearance by the FDA through the 510(k) premarket notification process described below. Most Class I products are exempt from the premarket notification requirements.

Class II devices are those that are subject to the General Controls, as well as Special Controls as deemed necessary by the FDA to ensure the safety and effectiveness of the device. These Special Controls can include performance standards, patient registries, FDA guidance documents, and post-market surveillance. Most Class II devices are subject to premarket review and clearance by the FDA. Premarket review and clearance by the FDA for Class II devices is accomplished through the 510(k) premarket notification process.

Class III devices include devices deemed by the FDA to pose the greatest risk such as life-supporting or life-sustaining devices, or implantable devices, in addition to those deemed novel and not substantially equivalent following the 510(k) process. The safety and effectiveness of Class III devices cannot be reasonably assured solely by the General Controls and Special Controls described above. Therefore, these devices are subject to the PMA application process, which is generally more costly and time-consuming than the 510(k) process. Through the PMA application process, the applicant must submit data and information demonstrating reasonable assurance of the safety and effectiveness of the device for its intended use to the FDA's satisfaction.

510(k) Pathway

To obtain 510(k) clearance, we must submit a premarket notification under Section 510(k) of the FD&C Act demonstrating that the proposed device is "substantially equivalent" to a predicate device. A predicate device is a legally marketed device that is not subject to premarket approval, i.e., a device that was legally marketed prior to May 28, 1976 (pre-amendments device) and for which a PMA is not required, a device that has been reclassified from Class III to Class II or I, or a device that was found substantially equivalent through the 510(k) process. To be "substantially equivalent," the proposed device must have the same intended use as the predicate device, and either have the same technological characteristics as the predicate device or have different technological characteristics and not raise different questions of safety or effectiveness than the predicate device. Clinical data is sometimes required to support substantial equivalence. The FDA's 510(k) clearance pathway usually takes from three to 12 months from the date the notification is submitted, but it can take considerably longer, depending on the extent of FDA's requests for additional information and the amount of time a sponsor takes to fulfill them. After a 510(k) is submitted, the FDA determines whether to accept it for substantive review. If it lacks necessary information for substantive review, the FDA will refuse to accept the 510(k) submission. If it is accepted for filing, the FDA begins a substantive review. By statute, the FDA is required to complete its review of a 510(k) premarket notification within 90 days of receiving the 510(k) submission. As a practical matter, clearance often takes longer, and clearance is never assured.

Although many 510(k) premarket notifications are cleared without clinical data, the FDA may require further information, including clinical data, to make a determination regarding substantial equivalence, which may significantly prolong the review process. If the FDA agrees that the device is substantially equivalent to a predicate device, it will grant clearance to commercially market the device. If the FDA determines that the device is not "substantially equivalent" to a predicate device, or if the device is automatically classified

into Class III, the device sponsor must then fulfill the much more rigorous premarketing requirements of the PMA process, or seek reclassification of the device through the *de novo* process.

After a device receives 510(k) clearance, any modification, including modification to or deviation from design, manufacturing processes, materials, packaging and sterilization that could significantly affect its safety or effectiveness, or that would constitute a new or major change in its intended use, may require a new 510(k) clearance or, depending on the modification, could require a PMA application. The FDA requires each manufacturer to make this determination initially, but the FDA can review any such decision and can disagree with a manufacturer's determination. If the FDA requires a new 510(k) clearance or approval of a PMA application for any modifications to a previously cleared product, the applicant may be required to cease marketing or recall the modified device until clearance or approval is received. In addition, in these circumstances, the FDA can impose significant regulatory fines or penalties for failure to submit the requisite 510(k) or PMA application(s).

Medical device types that the FDA has not previously classified as Class I, II, or III are automatically classified into Class III regardless of the level of risk they pose. The Food and Drug Administration Modernization Act of 1997 established a new route to market for low to moderate risk medical devices that are automatically placed into Class III due to the absence of a predicate device, called the "Request for Evaluation of Automatic Class III Designation," or the *de novo* classification procedure.

The *de novo* classification procedure allows a manufacturer whose novel device is automatically classified into Class III to request down-classification of its medical device into Class I or Class II on the basis that the device presents low or moderate risk, rather than requiring the submission and approval of a PMA application. Prior to the enactment of the Food and Drug Administration Safety and Innovation Act of 2012 (the "FDASIA"), a medical device could only be eligible for *de novo* classification if the manufacturer first submitted a 510(k) premarket notification and received a determination from the FDA that the device was not substantially equivalent. The FDASIA streamlined the *de novo* classification pathway by permitting manufacturers to request *de novo* classification directly without first submitting a 510(k) premarket notification to the FDA and receiving a not substantially equivalent determination. Under the FDASIA, the FDA is required to classify the device within 120 days following receipt of the *de novo* application, though in practice the process may take significantly longer. If the manufacturer seeks reclassification into Class II, the manufacturer must include a draft proposal for Special Controls that are necessary to provide a reasonable assurance of the safety and effectiveness of the medical device. In addition, the FDA may reject the reclassification petition if it identifies a legally marketed predicate device that would be appropriate for a 510(k) or determines that the device is not low to moderate risk or that General Controls would be inadequate to control the risks and Special Controls cannot be developed.

PMA Pathway

We must submit a PMA if a device cannot be cleared through the 510(k) clearance or *de novo* process. A PMA must be supported by extensive data, including, but not limited to, technical information, preclinical data, clinical trial data, manufacturing data, and labeling, to demonstrate to the FDA's satisfaction the safety and efficacy of the device for its intended use.

Following receipt of a PMA, the FDA conducts an administrative review to determine whether the application is sufficiently complete to permit a substantive review. If it is not, the agency will refuse to file the PMA. If it is, the FDA will accept the application for filing and begin the review. The FDA, by statute and by regulation, has 180 days to review a filed PMA, although the review of an application more often occurs over a significantly longer period of time. During this review period, the FDA may request additional information or clarification of information already provided, and the FDA may issue a major deficiency letter to the applicant, requesting the applicant's response to deficiencies communicated by the FDA. The FDA considers a PMA or PMA supplement to have been voluntarily withdrawn if an applicant fails to respond to an FDA request for information (*e.g.*, major deficiency letter) within a total of 360 days. Before approving or denying a PMA, an FDA advisory panel may review the PMA at a public meeting and provide the FDA with the committee's recommendation on whether the FDA should approve the submission, approve it with specific conditions, or not approve it. The FDA is not bound by the recommendations of an advisory panel, but it considers such recommendations carefully when making decisions. Prior to approval of a PMA, the FDA may conduct a bioresearch monitoring inspection of the clinical trial data and clinical trial sites, and a QSR inspection of the manufacturing facility and processes. The FDA can delay, limit, or deny approval of a PMA for many reasons, including:

- the device may not be shown safe or effective to the FDA's satisfaction;
- the data from preclinical studies and/or clinical trials may be found unreliable or insufficient to support approval;
- the manufacturing process or facilities may not meet applicable requirements; and
- changes in FDA approval policies or adoption of new regulations may require additional data.

If the FDA evaluation of a PMA is favorable, the FDA will issue either an approval letter or an approvable letter. The latter usually contains a number of conditions that must be met in order to secure final approval of the PMA. When and if those conditions have

been fulfilled to the satisfaction of the FDA, the agency will issue a PMA approval letter authorizing commercial marketing of the device, subject to the conditions of approval and the limitations established in the approval letter. If the FDA's evaluation of a PMA or manufacturing facilities is not favorable, the FDA will deny approval of the PMA or issue a not approvable letter. The FDA also may determine that additional tests or clinical trials are necessary, in which case the PMA approval may be delayed for several months or years while the trials are conducted and data are submitted in an amendment to the PMA, or the PMA is withdrawn and resubmitted when the data are available. The PMA process can be expensive, uncertain, and lengthy and a number of devices for which the FDA approval has been sought by other companies have never been approved by the FDA for marketing.

New PMAs or PMA supplements may be required for modifications to the manufacturing process, equipment or facility, quality control procedures, sterilization, packaging, expiration date, labeling, device specifications, components, materials or design of a device that has been approved through the PMA process. PMA supplements often require submission of the same type of information as an initial PMA, except that the supplement is limited to information needed to support any changes from the device covered by the approved PMA and may or may not require as extensive technical or clinical data or the convening of an advisory panel, depending on the nature of the proposed change.

In approving a PMA, as a condition of approval, the FDA may also require some form of postmarket studies or postmarket surveillance, whereby the applicant follows certain patient groups for a number of years and makes periodic reports to the FDA on the clinical status of those patients when necessary to protect the public health or to provide additional or longer term safety and effectiveness data for the device. The FDA may require postmarket surveillance for certain devices approved under a PMA or cleared under a 510(k) notification, such as implants or life-supporting or life-sustaining devices used outside a device user facility, devices where the failure of which would be reasonably likely to have serious adverse health consequences, or devices expected to have significant use in pediatric populations. The FDA may also approve a PMA with other post-approval conditions intended to ensure the safety and effectiveness of the device, such as, among other things, restrictions on labeling, promotion, sale, distribution, and use.

Clinical Trials

Clinical trials are almost always required to support a PMA and are sometimes required for a 510(k) premarket notification. In the United States, these trials often require submission of an application for an investigational device exemption ("IDE") if the investigation involves a significant risk device. Some types of studies deemed to present "non-significant risk" are deemed to have an approved IDE—without affirmative submission of an IDE application to the FDA—once certain requirements are addressed and institutional review board ("IRB") approval is obtained. The IDE application must be supported by appropriate data, such as animal and laboratory testing results, showing that it is safe to test the device in humans and that the testing protocol is scientifically sound. The IDE must be approved in advance by the FDA for a specified number of patients, unless the product candidate is deemed a non-significant risk device and is eligible for more abbreviated IDE requirements. Clinical trials for a significant risk device may begin once the IDE application is approved by the FDA and appropriate IRBs at the clinical trial sites. Submission of an IDE will not necessarily result in the ability to commence clinical trials, and although the FDA's approval of an IDE allows clinical testing to go forward for a specified number of subjects, it does not bind the FDA to accept the results of the trial as sufficient to prove the product's safety and efficacy, even if the trial meets its intended success criteria.

Future clinical trials involving our product candidates will most likely require that we obtain an IDE from the FDA prior to commencing clinical trials and that the trial be conducted under the oversight of IRBs at the clinical trial sites. All clinical trials must be conducted in accordance with the FDA's IDE regulations that govern investigational device labeling, prohibit promotion, and specify an array of recordkeeping, reporting and monitoring responsibilities of study sponsors and study investigators. Clinical trials must further comply with the FDA's Good Clinical Practices ("GCP") requirements for IRB approval and for informed consent and other human subject protections. Required records and reports are subject to inspection by the FDA. The results of clinical testing may be unfavorable, or, even if the intended safety and efficacy success criteria are achieved, may not be considered sufficient for the FDA to grant marketing approval or clearance of a product candidate.

Breakthrough Devices and Safer Technologies Programs

The Breakthrough Devices Program is a voluntary program intended to expedite the review, development, assessment and review of certain medical devices that provide for more effective treatment or diagnosis of life-threatening or irreversibly debilitating human diseases or conditions for which no approved or cleared treatment exists or that offer significant advantages over existing approved or cleared alternatives. For Breakthrough Devices, the FDA intends to provide interactive and timely communication with the sponsor during device development and throughout the review process. The FDA also intends to assign staff to be available within a reasonable time to address questions by institutional review committees concerning the conditions and clinical testing expectations applicable to the investigational use of a Breakthrough Device. In addition, all submissions for devices designated as Breakthrough Devices will receive priority review, meaning that the review of the submission is placed at the top of the appropriate review queue and receives additional review resources, as needed.

In January 2021, the FDA released final guidance on the Safer Technologies Program ("STeP"), which is intended for medical devices that treat or diagnose diseases or conditions that are less serious than those eligible for the Breakthrough Devices Program, including non-life-threatening or reasonably reversible conditions. STeP is modeled after the Breakthrough Devices Program and is intended to provide similar benefits, including expedited development and FDA review of submissions, for medical devices and device-led combination products that are likely to offer a safer treatment or diagnosis as compared to currently available alternatives.

Postmarket Requirements—U.S.

After the FDA permits a device to enter commercial distribution, numerous regulatory requirements continue to apply. These include:

- establishment registration and device listing with the FDA;
- the FDA's QSR, which requires manufacturers, including third-party manufacturers, to follow stringent design, testing, production, control, supplier/contractor selection, complaint handling, documentation and other quality assurance procedures during all aspects of the manufacturing process;
- labeling regulations, unique device identification requirements and FDA prohibitions against the promotion of products for uncleared, unapproved or off-label uses;
- advertising and promotion requirements;
- Restrictions on sale, distribution or use of a device;
- PMA annual reporting requirements;
- PMA approval or clearance of a 510(k) for certain product modifications;
- medical device reporting regulations, which require that manufacturers report to the FDA if their device may have caused or contributed to a death or serious injury or malfunctioned in a way that would likely cause or contribute to a death or serious injury if the malfunction were to recur;
- medical device correction and removal reporting regulations, which require that manufacturers report to the FDA field corrections and product recalls or removals if undertaken to reduce a risk to health posed by the device or to remedy a violation of the FD&C Act that may present a risk to health;
- recall requirements, including a mandatory recall if there is a reasonable probability that the device would cause serious adverse health consequences or death;
- an order of repair, replacement or refund;
- device tracking requirements; and
- post-market surveillance regulations, which apply when necessary to protect the public health or to provide additional safety and effectiveness data for the device.

Additionally, manufacturers are subject to unannounced inspections by the FDA to determine compliance with the QSR, which cover the methods and the facilities and controls for the design, manufacture, testing, production, processes, controls, quality assurance, labeling, packaging, distribution, installation and servicing of finished devices intended for human use. The QSR also requires, among other things, maintenance of a device master file, device history file, and complaint files. Manufacturers are subject to periodic scheduled or unscheduled inspections by the FDA. A failure to maintain compliance with the QSR requirements could result in the shut-down of, or restrictions on, manufacturing operations and the recall or seizure of products. The discovery of previously unknown problems with products, including unanticipated adverse events or adverse events of increasing severity or frequency, whether resulting from the use of the device within the scope of its clearance or approval or off-label by a physician in the practice of medicine, could result in restrictions on the device, including the removal of the product from the market or voluntary or mandatory device recalls. In addition, the FDA can issue warning letters or untitled letters, impose injunctions, suspend regulatory clearance or approvals, ban certain medical devices, detain or seize adulterated or misbranded medical devices, order repair, replacement or refund of these devices, and require notification of health professionals and others with regard to medical devices that present unreasonable risks of substantial harm to the public health. The FDA may also initiate action for civil penalties and/or criminal prosecution of such violations.

There are also certain requirements of state, local, and foreign governments that must be complied with in the manufacturing and marketing of our products once we have the appropriate marketing approvals. We will need to maintain customer complaint files, record all lot numbers of disposable products, and conduct periodic audits to assure compliance with applicable regulations. We will place special emphasis on customer training and advise all customers that device operation should be undertaken only by qualified

personnel. In addition to laws and regulations in the United States, we are subject to a variety of laws and regulations in other jurisdictions governing, among other things, clinical trials and any commercial sales and distribution of our product candidates.

Postmarket Requirements—EU

The regulatory review process varies from country to country and may in some cases require the submission of clinical data. Our international sales will be subject to regulatory requirements in the countries in which our product candidates are sold. In addition, the EU has adopted the EU Medical Device Regulation (EU 2017/745) (the "EU MDR") which imposes stricter requirements for the marketing and sale of medical devices than in the U.S., including in the area of clinical evaluation requirements, quality systems and post-market surveillance. The transition period provided for in the EU MDR for existing CE certifications issued under the previous Medical Devices Directive will end on May 26, 2024. For certain medical devices, the transition period was extended, ending between December, 31, 2026 and December 31, 2028, depending on the class of the device and the fulfillment of certain additional conditions. (Regulation (EU) 2023/607). Complying with these regulations may require us to incur significant expenditures. Failure to meet these regulatory requirements could adversely impact our business in the EU and other regions that tie their product registrations to the EU requirements.

Drug and Biologics Regulation

Premarket Requirements—U.S.

Drugs and biologics are regulated under the FD&C Act and, for biologics, the Public Health Service Act ("PHSA"). Generally, a new drug may be marketed in the United States only if the FDA has approved a New Drug Application ("NDA") containing substantial evidence that the new drug is safe and effective for its intended use. A new biologic may generally only be marketed in the United States if the FDA has approved a Biologics License Application ("BLA") containing substantial evidence that the biologic is safe, pure, and potent for its intended use. The results of preclinical studies and clinical trials, along with information regarding the manufacturing process, analytical tests conducted on the chemistry of the drug, proposed labeling and other relevant information are submitted to the FDA as part of an NDA/BLA, and FDA review and approval of the NDA/BLA is necessary prior to any commercial marketing or sale of a drug or biologic in the United States.

The process generally required by the FDA before a biologic or drug product candidate may be marketed in the United States involves the following:

- completion of preclinical laboratory tests and animal studies performed in accordance with the FDA's Good Laboratory Practice ("GLP") regulations, the Animal Welfare Act, and other laws and regulations, as applicable;
- submission to the FDA of an IND, which must become effective before human clinical trials may begin and must be updated at least once annually;
- approval by an IRB or ethics committee at each clinical site before the trial is initiated;
- manufacture of the proposed drug or biologic candidate in accordance with current good manufacturing practice ("cGMP");
- performance of adequate and well-controlled clinical trials in accordance with the FDA's GCP requirements and other applicable regulations to establish the safety, purity and potency of the proposed biologic, and the safety and efficacy of the proposed drug for each indication;
- preparation of and submission to the FDA of a BLA or NDA after successful completion of all pivotal clinical trials;
- satisfactory completion of an FDA Advisory Committee review, if applicable;
- a determination by the FDA within 60 days of its receipt of an NDA or BLA to file the application for substantive review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities at which the proposed product candidate is produced to assess cGMP and to assure that the facilities, methods and controls are adequate for manufacturing of the drug or biologic according to its specifications; and
- FDA review and approval of the BLA or NDA prior to any commercial marketing or sale of the biologic or drug product in the United States.

Preclinical Testing

Before testing any compound or biologic in human subjects in the United States, we must generate extensive preclinical data. Preclinical testing generally includes laboratory evaluation of product chemistry and formulation, as well as toxicological and

pharmacological studies in several animal species to assess the quality and safety of the product candidate. Certain animal studies must be performed in compliance with the FDA's GLP regulations and the U.S. Department of Agriculture's Animal Welfare Act.

IND Submission

Human clinical trials for drugs or biologics in the United States cannot commence until an IND is submitted and becomes effective. A company must submit preclinical testing results, together with manufacturing information and analytical data, to the FDA as part of the IND, and the FDA must evaluate whether there is an adequate basis for testing the drug in initial clinical studies in human volunteers. The sponsor will also include a protocol detailing, among other things, the objectives of the initial clinical trial, the parameters to be used in monitoring safety, and the effectiveness criteria to be evaluated, if the initial clinical trial lends itself to an efficacy evaluation. Some preclinical testing may continue even after the IND is submitted. An IND will automatically become effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to the proposed clinical studies. In such a case, the IND may be placed on clinical hold and the IND sponsor and the FDA must resolve any outstanding concerns or questions before clinical studies can begin. Once human clinical trials have commenced, the FDA may stop the clinical trials by placing them on partial or full "clinical hold" because of concerns about the safety of the product candidate being tested, or for other reasons.

Clinical Trials

Clinical trials involve the administration of the drug to healthy human volunteers or to patients, under the supervision of a qualified investigator. The conduct of clinical trials is subject to extensive regulation, including compliance with the FDA's bioresearch monitoring regulations and GCP requirements, which establish standards for conducting, recording data from, and reporting the results of, clinical trials, and are intended to assure that the data and reported results are credible and accurate, and that the rights, safety, and well-being of study participants are protected. Clinical trials must be conducted under protocols that detail the study objectives, parameters for monitoring safety, and the efficacy criteria, if any, to be evaluated. Each protocol is reviewed by the FDA as part of the IND. In addition, each clinical trial must be reviewed and approved by, and conducted under the auspices of, an IRB. Companies sponsoring the clinical trials, investigators, and IRBs also must comply with, as applicable, regulations and guidelines for obtaining informed consent from the study subjects, following the protocol and investigational plan, adequately monitoring the clinical trial, and timely reporting of adverse events. Foreign studies conducted under an IND must meet the same requirements that apply to studies being conducted in the United States. Data from a foreign study not conducted under an IND may be submitted in support of an NDA or BLA if the study was conducted in accordance with GCP requirements and the FDA is able to validate the data.

A study sponsor is required to publicly post certain details about clinical trials and clinical trial results on government or independent websites (such as http://clinicaltrials.gov). Human clinical trials typically are conducted in three or four sequential phases, although the phases may overlap with one another:

- Phase 1 clinical trials include the initial administration of the investigational drug or biologic to humans, typically to a small group of healthy human subjects, but occasionally to a group of patients with the targeted disease or disorder. Phase 1 clinical trials generally are intended to determine the metabolism and pharmacologic actions of the drug or biologic, the side effects associated with increasing doses, and, if possible, to gain early evidence of effectiveness.
- Phase 2 clinical trials generally are controlled studies that involve a relatively small sample of the intended patient population, and are designed to develop data regarding the product candidate's effectiveness, to determine dose response and the optimal dose range, and to gather additional information relating to safety and potential adverse effects.
- Phase 3 clinical trials are conducted after preliminary evidence of effectiveness has been obtained, and are intended to gather the additional information about safety and effectiveness necessary to evaluate the drug's overall risk-benefit profile for a particular use, and to provide a basis for physician labeling. Generally, Phase 3 clinical development programs consist of expanded, large-scale studies of patients with the target disease or disorder to obtain statistical evidence of the efficacy and safety of the drug at the proposed dosing regimen, or the safety, purity, and potency of a biological product candidate.
- Phase 4 clinical trials may be conducted in some cases, including where the FDA conditions approval of an NDA or BLA for a product candidate on the sponsor's agreement to conduct additional clinical studies after approval. In other cases, a sponsor may voluntarily conduct additional clinical studies after approval to gain more information about the product candidate. Such post-approval studies are typically referred to as Phase 4 clinical trials.

A pivotal trial is a clinical study that is designed to generate substantial evidence of product candidate's safety and efficacy to meet regulatory agency requirements and serve as the basis for approval of the product candidate. Generally, pivotal trials are Phase 3 trials, but the FDA may accept results from Phase 2 trials if the trial design provides a well-controlled and reliable assessment of clinical benefit, particularly in situations where there is an unmet medical need and the results are sufficiently robust.

The sponsoring company, the FDA, or the IRB may suspend or terminate a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk. Further, success in early stage clinical trials does not assure success in later-stage clinical trials. Data obtained from clinical activities are not always conclusive and may be subject to alternative interpretations that could delay, limit, or prevent regulatory approval. Additionally, some clinical studies are overseen by an independent group of qualified experts organized by the clinical study sponsor, known as a data safety monitoring board or data monitoring committee. This group provides authorization for whether or not a trial may move forward at designated check points based on access to certain data from the trial. We may also suspend or terminate a clinical study based on safety or efficacy concerns, evolving business objectives and/or competitive climate.

During the development of a new drug or biologic, sponsors may seek opportunities to meet with the FDA at certain points. These points may be prior to submission of an IND, at the end of Phase 2, and before an NDA or BLA is submitted. Meetings at other times may be requested. These meetings can provide an opportunity for the sponsor to share information about the data gathered to date, for the FDA to provide advice, and for the sponsor and the FDA to reach agreement on the next phase of development. For example, sponsors typically use the meetings at the end of the Phase 2 trial to discuss Phase 2 clinical results and present plans for the pivotal Phase 3 clinical trial that they believe will support approval of the new drug or biologic.

A sponsor may choose, but is not required, to conduct a foreign clinical study under an IND. When a foreign clinical study is conducted under an IND, all IND requirements must be met unless waived. When the foreign clinical study is not conducted under an IND, the sponsor must ensure that the study complies with certain FDA regulatory requirements in order to use the study as support for an IND or application for marketing approval or licensure, including that the study was conducted in accordance with GCP, including review and approval by an independent ethics committee and use of proper procedures for obtaining informed consent from subjects, and the FDA is able to validate the data from the study through an onsite inspection if the FDA deems such inspection necessary. The GCP requirements encompass both ethical and data integrity standards for clinical studies.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, the manufacturer must develop methods for testing the identity, strength, quality, and purity of the final drug. In addition, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life. While the IND is active and before approval, progress reports summarizing the results of the clinical trials and nonclinical studies performed since the last progress report must be submitted at least annually to the FDA, and written IND safety reports must be submitted to the FDA and investigators for serious and unexpected suspected adverse events, findings from other studies suggesting a significant risk to humans exposed to the same or similar drugs, findings from animal or *in vitro* testing suggesting a significant risk to humans, and any clinically important increased incidence of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure.

There are also requirements governing the reporting of ongoing clinical trials and completed trial results to public registries. Sponsors of certain clinical trials of FDA regulated products are required to register and disclose specified clinical trial information, which is publicly available at www.clinicaltrials.gov. Information related to the product, patient population, phase of investigation, trial sites and investigators and other aspects of the clinical trial is then made public as part of the registration. Sponsors are also obligated to disclose certain results of their clinical trials after completion.

NDA/BLA Submission and Review

After completing clinical testing of an investigational drug or biologic, a sponsor must prepare and submit an NDA or BLA for review and approval by the FDA. The NDA is a comprehensive, multi-volume application that includes, among other things, the results of preclinical and clinical studies, information about the drug's composition, and plans for manufacturing, packaging, and labeling the drug. For certain product candidates, such as immunotherapeutic antibodies, this information is submitted in a BLA. Data can come from company-sponsored clinical studies intended to test the safety and effectiveness of a use of the product candidate, or from a number of alternative sources, including studies initiated by investigators. Under federal law, the submission of most NDAs and BLAs is subject to an application user fee, and the sponsor of an approved NDA or BLA is also subject to annual prescription drug program fees. These fees are typically increased annually. A waiver of user fees may be obtained under certain limited circumstances.

When an NDA or BLA is submitted, the FDA conducts a preliminary review to determine whether the application is sufficiently complete to be accepted for filing. If it is not, the FDA may refuse to file the application and request additional information, in which case the application must be resubmitted with the supplemental information, and review of the application is delayed.

FDA performance goals generally provide for action on a standard NDA or an original BLA submission within 10 months of the 60-day filing date, but that goal may be extended in certain circumstances. Moreover, the review process is often significantly extended

by FDA requests for additional information or clarification. Before approving a BLA or NDA, the FDA typically will inspect the facility or facilities at which the product candidate is manufactured. The FDA will not approve the application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product candidate within required specifications. Additionally, before approving a BLA or NDA, the FDA will typically inspect one or more clinical sites or investigators to assure compliance with GCP requirements. If the FDA determines that the application, clinical data, manufacturing process, or manufacturing facilities are not acceptable, it will outline the deficiencies in the submission and often will request additional testing or information. Notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

As part of its review, the FDA may refer an NDA or BLA to an advisory committee for evaluation and a recommendation as to whether the application should be approved. Typically, an advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. Although the FDA is not bound by the recommendation of an advisory committee, the agency carefully considers such recommendations when making decisions. The FDA may also determine that a risk evaluation and mitigation strategy ("REMS") is necessary to ensure that the benefits of a new product candidate outweigh its risks, and the product candidate can therefore be approved. A REMS may include various elements, ranging from medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools, depending on what the FDA considers necessary for the safe use of the drug.

After review of an NDA or BLA, the FDA may decide to not approve the application and issue a Complete Response letter outlining the deficiencies in the submission. The Complete Response letter also may request additional information, including additional preclinical or clinical data. Even if such additional information and data are submitted, the FDA may decide that the NDA or BLA still does not meet the standards for approval. Data from clinical trials are not always conclusive and the FDA may interpret data differently than the sponsor. Obtaining regulatory approval often takes a number of years, involves the expenditure of substantial resources, and depends on a number of factors, including the severity of the disease in question, the availability of alternative treatments, and the risks and benefits demonstrated in clinical trials. Additionally, as a condition of approval, the FDA may impose restrictions that could affect the commercial success of a drug or require post-approval commitments, including the completion within a specified time period of additional Phase 4 clinical studies.

In addition, the Pediatric Research Equity Act ("PREA") requires a sponsor to conduct pediatric clinical trials for most drugs and biologics, including for a new active ingredient, new indication, new dosage form, new dosing regimen, or new route of administration. Under PREA, original NDAs, BLAs, and supplements thereto must contain a pediatric assessment unless the sponsor has received a deferral or waiver. The required assessment must evaluate the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The sponsor or FDA may request a deferral of pediatric clinical trials for some or all of the pediatric subpopulations. A deferral may be granted for several reasons, including a finding that the drug or biologic is ready for approval for use in adults before pediatric clinical trials are complete or that additional safety or effectiveness data needs to be collected before the pediatric clinical trials begin.

Post-approval modifications to the drug or biologic product candidate, such as changes in indications, labeling, or manufacturing processes or facilities, may require a sponsor to develop additional data or conduct additional preclinical or clinical trials, to be submitted in a new or supplemental NDA or BLA, which would require FDA approval.

Expedited Development and Review Programs

The FDA has established a number of programs intended to expedite the development and review of products intended to treat serious and life-threatening diseases or conditions. First, the FDA has a Fast Track program that is designed to expedite or facilitate the process for reviewing new drug products intended to treat a serious or life-threatening disease or condition and data demonstrate the potential to address unmet medical needs for the disease or condition. Fast Track designation applies to the product and the specific indication for which it is being studied. For a Fast Track-designated product, the FDA may consider for review sections of the NDA or BLA on a rolling basis before the complete application is submitted.

A product, including a product with a Fast Track designation, may also be eligible for other types of FDA programs intended to expedite development and review, such as priority review and accelerated approval. A product is eligible for priority review if there is evidence that it would be a significant improvement in the treatment, diagnosis, or prevention of a disease compared to marketed products. The FDA will attempt to direct additional resources to the evaluation of an application for a new drug designated for priority review in an effort to facilitate the review. The FDA endeavors to review applications with priority review designations within six months of the filing date as compared to 10 months for review of original BLAs and new molecular entity NDAs under its standard review goals.

In addition, a product may be eligible for accelerated approval. Drug and biologic products intended to treat serious or life-threatening diseases or conditions may be eligible for accelerated approval upon a determination that the product has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality but that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. As a condition of accelerated approval, the FDA may require that a sponsor of a drug receiving accelerated approval perform confirmatory clinical trials after approval. Under the Food and Drug Omnibus Reform Act of 2022, the FDA may require, as appropriate, that such studies be underway prior to approval or within a specific time period after the date of approval for a product granted accelerated approval. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product. The FDA also has increased authority for expedited procedures to withdraw approval of a product or indication approved under accelerated approval if the sponsor fails to conduct the required post-marketing studies or if such studies fail to verify the predicted clinical benefit. Fast Track designation, priority review, and accelerated approval do not change the standards for approval but may expedite the development or approval process.

The FDA also designates certain products as “breakthrough therapies,” if the product is intended, alone or in combination with one or more other products, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. This designation includes all of the Fast Track program features, as well as more intensive FDA interaction and guidance. The Breakthrough Therapy Designation is a distinct status from both accelerated approval and priority review, which can also be granted to the same drug if relevant criteria are met. All requests for breakthrough therapy designation will be reviewed within 60 days of receipt, and the FDA will either grant or deny the request.

Fast track designation, priority review, accelerated approval, and breakthrough therapy designation do not change the standards for approval and may not result in fast or more efficient review.

Hatch-Waxman Act

The Drug Price Competition and Patent Term Restoration Act of 1984 (the "Hatch-Waxman Act") establishes two abbreviated approval pathways for pharmaceutical products that are in some way follow-on or bioequivalent versions of drugs approved through the NDA process.

Generic Drugs

A generic version of an approved drug is approved by means of an abbreviated new drug application ("ANDA"). An ANDA is a comprehensive submission that contains, among other things, data, and information pertaining to the active pharmaceutical ingredient, drug product formulation, specifications and stability of the generic drug, as well as analytical methods, manufacturing process validation data and quality control procedures. Premarket applications for generic drugs are termed abbreviated because they generally do not include preclinical and clinical data to demonstrate safety and effectiveness. Instead, a generic applicant must demonstrate that its product performs in the same manner as, or is bioequivalent to, the innovator drug, also referred to as a reference listed drug ("RLD"), and is equivalent to the RLD with respect to the active ingredients, the route of administration, the dosage form, quality and performance characteristics, the strength of the drug, and intended use. In certain situations, an applicant may obtain ANDA approval of a generic product with a strength or dosage form that differs from a referenced innovator drug pursuant to the filing and approval of an ANDA suitability petition. The FDA will approve the generic product as suitable for an ANDA if it finds that the generic product does not raise new questions of safety and effectiveness as compared to the innovator product. A product is not eligible for ANDA approval if the FDA determines that it is not bioequivalent to the referenced innovator drug, if it is intended for a different use, or if it is not subject to an approved Suitability Petition. However, such a product might be approved under an NDA, with supportive data from clinical trials.

505(b)(2) NDAs

Section 505(b)(2) of the FD&C Act provides an alternate regulatory pathway to obtain FDA approval for product candidates that represent modifications to formulations or uses of previously approved drug products. Specifically, Section 505(b)(2) permits the filing of an NDA where at least some of the information required for approval comes from studies not conducted by or for the applicant and for which the applicant has not obtained a right of reference. The applicant may rely to some extent upon the FDA’s findings of safety and effectiveness for an approved product that acts as the RLD and submit its own product-specific data—which may include data from preclinical studies or clinical trials conducted by or on behalf of the applicant—to address differences between the product candidate and the RLD. Unlike an ANDA, this does not excuse the sponsor from demonstrating the proposed product candidate’s safety and effectiveness. Rather, the sponsor is permitted to rely to some degree on the FDA’s finding that the RLD is safe and effective, and must submit its own product candidate-specific data of safety and effectiveness to an extent necessary because of the differences between the products. An NDA approved under Section 505(b)(2) may in turn serve as an RLD for subsequent applications from other sponsors.

RLD Patents

In seeking approval for a drug through an NDA, including a 505(b)(2) NDA, applicants are required to list with the FDA certain patents whose claims cover the applicant's product. Upon approval of an NDA, each of the patents listed in the application for the drug is then published in the FDA publication, *Approved Drug Products with Therapeutic Equivalence Evaluations*, which is referred to as the *Orange Book*. Any applicant who files an ANDA seeking approval of a generic equivalent version of a drug listed in the Orange Book or a 505(b)(2) NDA referencing a drug listed in the Orange Book must certify to the FDA that (1) no patent information on the drug product that is the subject of the application has been submitted to the FDA; (2) such patent has expired; (3) the date on which such patent expires; or (4) such patent is invalid or will not be infringed upon by the manufacture, use or sale of the drug product for which the application is submitted. This last certification is known as a paragraph IV certification. A notice of the paragraph IV certification must be provided to each owner of the patent that is the subject of the certification and to the holder of the approved NDA to which the ANDA or 505(b)(2) application refers. The applicant may also elect to submit a "section viii" statement certifying that its proposed label does not contain (or carves out) any language regarding the patented method-of-use rather than certify to a listed method-of-use patent. If the reference NDA holder and patent owners assert a patent challenge directed to one of the Orange Book listed patents within 45 days of the receipt of the paragraph IV certification notice, the FDA is prohibited from approving the application until the earlier of 30 months from the receipt of the paragraph IV certification expiration of the patent, settlement of the lawsuit or a decision in the infringement case that is favorable to the applicant. The ANDA or 505(b)(2) application also will not be approved until any applicable non-patent exclusivity listed in the Orange Book for the branded reference drug has expired as described in further detail below.

Regulatory Exclusivities

The Hatch-Waxman Act provides periods of regulatory exclusivity for products that would serve as RLDs for an ANDA or 505(b)(2) application. For example, a pharmaceutical manufacturer may obtain five years of non-patent exclusivity upon NDA approval of a new chemical entity ("NCE")—a drug that contains an active moiety that has not been approved by the FDA in any other NDA. An "active moiety" is defined as the molecule or ion responsible for the drug substance's physiological or pharmacologic action. During this five-year exclusivity period, the FDA may not accept for filing any ANDA seeking approval of a generic version of that drug or any 505(b)(2) application for a drug with the same active moiety. An ANDA or 505(b)(2) application may be submitted after four years, however, if the sponsor of the application makes a paragraph IV certification.

A product that is not an NCE, including a product approved through a 505(b)(2) NDA, may qualify for a three-year period of exclusivity if the NDA contains new clinical data, derived from studies conducted by or for the sponsor (other than bioavailability or bioequivalence studies), that were essential for approval. In that instance, the exclusivity period does not preclude filing or review of the ANDA or 505(b)(2) application; rather, the FDA is precluded from granting final approval to the ANDA or 505(b)(2) application until three years after approval of the RLD. Additionally, the exclusivity applies only to the conditions of approval that required submission of the clinical data. For example, if an NDA is submitted for a product candidate that is not an NCE, but that seeks approval for a new indication, and clinical data were required to demonstrate the safety or effectiveness of the product candidate for that new application, the FDA could not approve an ANDA or 505(b)(2) application for another product candidate with that active moiety for that use.

The Biologics Price Competition and Innovation Act

The Patient Protection and Affordable Care Act, as amended by the Healthcare and Education Reconciliation Act of 2010, (collectively, the "ACA") includes a subtitle called the Biologics Price Competition and Innovation Act (the "BPCIA"), which authorizes the FDA to license a biological product candidate that is biosimilar to or interchangeable with an FDA-licensed biologic through an abbreviated pathway. Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity, and potency, can be shown through analytical studies, animal studies, and a clinical study or studies. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. Complexities associated with the larger, and often more complex, structures of biological products, as well as the processes by which such products are manufactured, pose significant hurdles to implementation of the abbreviated approval pathway that are still being addressed by the FDA.

The BPCIA establishes criteria for determining that a product candidate is biosimilar to an already-licensed biologic, or reference product, and establishes a process by which a BLA for a biosimilar product candidate is submitted, reviewed, and licensed. The BPCIA provides periods of exclusivity that protect a reference product from biosimilars competition. Under the BPCIA, the FDA may not accept a biosimilar application for review until four years after the date of first licensure of the reference product, and the biosimilar may not be licensed until at least 12 years after the reference product's approval. During this 12-year period of exclusivity,

another company may still market a competing version of the reference product if the FDA approves a BLA for the competing product containing the sponsor's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity, and potency of their product.

Additionally, the BPCIA establishes procedures by which the biosimilar applicant provides information about its application and product candidate to the reference product sponsor, and by which information about potentially relevant patents may be shared and litigation over patents may proceed in advance of approval. The timing of final FDA approval of a biosimilar for commercial distribution depends on a variety of factors, including whether the manufacturer of the reference product is entitled to one or more statutory exclusivity periods, during which time the FDA is prohibited from approving any product candidates that are biosimilar to the branded product. The BPCIA also provides a period of exclusivity for the first biosimilar determined by the FDA to be interchangeable with the reference product.At this juncture, it is unclear whether products deemed "interchangeable" by the FDA will, in fact, be readily substituted by pharmacies, as these substitution practices are governed by state pharmacy law.

The contours of the BPCIA continue to be defined as the statute is implemented over a period of years. This likely will be accomplished by a variety of means, including decisions related to the statute by the relevant federal courts. The FDA has to date issued various guidance documents and other materials indicating the agency's thinking regarding a number of issues implicated by the BPCIA. Additionally, the FDA's approval of a number of biosimilar applications in recent years has helped define the agency's approach to certain issues. However, the ultimate impact, implementation, and meaning of the BPCIA remains subject to significant uncertainty.

Post-Approval Regulation of Drug and Biologic Products

Once a drug or biologic is approved, it and its manufacturer will be subject to continuing regulation by the FDA. If ongoing regulatory requirements are not met or if safety problems occur after a product reaches the market, the FDA may at any time withdraw product approval or take actions that would limit or suspend marketing. Additionally, the FDA may require post-marketing studies or clinical trials if new safety information develops.

Other Requirements

In addition, if we hold approved NDAs or BLAs and/or manufacture or distribute drug or biological products, we must comply with other regulatory requirements, including registration and listing, submitting annual reports, reporting information about adverse drug experiences, and maintaining certain records. Similar, and in some cases additional, requirements exist in other countries, including the EU.

EU Requirements

We must obtain the requisite marketing authorizations from regulatory authorities in foreign countries prior to the commencement of clinical trials or marketing of a product in those countries. Certain countries outside of the United States have a similar process that requires the submission of a clinical trial application ("CTA"), much like an IND, prior to the commencement of clinical trials. In the EU, for example, the conduct of clinical trials is currently governed by the EU Clinical Trials Regulation (EU) No. 536/2014 ("CTR"). The CTR replaced the Clinical Trials Directive 2001/20/EC ("Clinical Trials Directive") effective January 31, 2022, and introduced a complete overhaul of the existing regulation of clinical trials for medicinal products in the EU.

Under the new CTR, a sponsor may submit a single application for approval of a clinical trial through a centralized EU clinical trials portal. One national regulatory authority (the reporting EU Member State proposed by the applicant) will take the lead in validating and evaluating the application consult and coordinate with the other concerned Member States. If an application is rejected, it may be amended and resubmitted through the EU clinical trials portal. If an approval is issued, the sponsor may start the clinical trial in all concerned Member States. However, a concerned EU Member State may in limited circumstances declare an "opt-out" from an approval and prevent the clinical trial from being conducted in such Member State. The CTR also aims to streamline and simplify the rules on safety reporting, and introduces enhanced transparency requirements such as mandatory submission of a summary of the clinical trial results to the EU Database ("CTIS"). The CTR includes a three-year transition period. Member states will work in CTIS immediately after the system has gone live. Since January 31, 2023, submission of initial clinical trial applications via CTIS is mandatory, and by January 31, 2025, all ongoing trials approved under the former Clinical Trials Directive will need to comply with the CTR and must be transitioned to CTIS.

The requirements and process governing the conduct of clinical trials, product licensing, pricing, and reimbursement may vary from country to country. In all cases in EU Member States, for example, the clinical trials must be conducted in accordance with GCP requirements, applicable regulatory requirements, and ethical principles that have their origin in the Declaration of Helsinki. Other EU requirements include regulations concerning marketing authorizations, pricing and reimbursement, patient rights in cross-border healthcare, advertising, and promotion, interactions with physicians, bribery, and corruption.

For other countries outside of the EU, such as countries in Eastern Europe, Central and South America, or Asia, the requirements governing the conduct of clinical trials, product licensing, pricing, and reimbursement vary from country to country. In all cases, again, the clinical trials are conducted in accordance with GCP requirements, applicable regulatory requirements, and ethical principles that have their origin in the Declaration of Helsinki.

If we fail to comply with applicable foreign regulatory requirements, we may be subject to, among other things, warning letters or untitled letters, injunctions, civil, administrative, or criminal penalties, monetary fines or imprisonment, suspension or withdrawal of regulatory approvals, suspension of ongoing clinical studies, refusal to approve pending applications or supplements to applications filed by us, suspension or the imposition of restrictions on operations, product recalls, the refusal to permit the import or export of our products or the seizure or detention of products.

Combination Products

A combination product is the combination of two or more regulated components, i.e., drug-device, biologic-device, drug-biologic, or drug-device-biologic, that are combined or mixed and produced as a single entity; packaged together in a single package or as a unit; or a drug, device, or biological product packaged separately that according to its investigational plan or proposed labeling is intended for use only with an approved individually specified drug, device, or biological product where both are required to achieve the intended use, indication, or effect.

To determine which of the FDA center or centers will review a combination product candidate submission, companies may submit a request for assignment to the FDA. Those requests may be handled formally or informally. In some cases, jurisdiction may be determined informally based on FDA experience with similar products. However, informal jurisdictional determinations are not binding on the FDA. Companies also may submit a formal Request for Designation to the FDA Office of Combination Products. The Office of Combination Products will review the request and make its jurisdictional determination within 60 days of receiving a Request for Designation.

The FDA will determine which center or centers within the FDA will review the product candidate and under what legal authority the product candidate will be reviewed. Depending on how the FDA views the product candidates that are developed, the FDA may have aspects of the product candidate reviewed by the FDA's Center for Biologics Evaluation and Research, Center for Devices and Radiological Health and Center for Drug Evaluation and Research, though one center will be designated as the center with primary jurisdiction, based on the product candidate's primary mode of action. The FDA determines the primary mode of action based on the single mode of action that provides the most important therapeutic action of the combination product candidate—the mode of action expected to make the greatest contribution to the overall intended therapeutic effects of the combination product candidate. The review of such combination product candidates is often complex and time consuming, as the FDA may select the combination product candidate to be reviewed and regulated by one or multiple of the FDA centers identified above, which could affect the path to regulatory clearance or approval. Furthermore, the FDA may also require submission of separate applications to multiple centers.

We are developing certain product candidates that will be subject to regulation in the United States as combination products. We believe that the primary mode of action of these candidates is the drug or biologic component. We expect to seek approval for these candidates through submission of a BLA for biologic candidates and through submission of a NDA submitted under Section 505(b)(2) of the FD&C Act for small molecule candidates. Based on a pre-IND meeting, we do not expect that the FDA will require a separate marketing authorization for each constituent of these product candidates.

The post-market requirements that apply to the cleared or approved product will largely be aligned with the agency center determined to have primary jurisdiction over the product candidate and that provided marketing authorization, but manufacturers must also comply with certain post-market requirements with respect to the constituent parts of combination products. In April 2019, the FDA published a final guidance document entitled Compliance Policy for Combination Product Postmarketing Safety Reporting, which is intended to assist manufacturers of combination products comply with reporting requirements applicable to such products. In December 2019, the FDA issued draft guidance intended to clarify how sponsors of combination products can: establish the scientific relevance of information from another development program to support an application for the FDA approval of a combination product. In December 2020, the FDA issued final guidance on how sponsors of combination products can obtain feedback from the FDA on scientific and regulatory questions pertaining to the combination product. In January 2022, FDA issued a final guidance document on principles for premarket pathways for combination products. FDA has issued, and will continue to issue, guidance documents on the premarket and postmarket regulatory requirements applicable to combination products.

After issuing marketing authorizations, the FDA has discretion in determining post-approval compliance requirements for combination products and could thus require compliance with certain cGMP requirements as well as QSR requirements for device components of a combination product. Other post-market requirements analogous to those described above for medical devices and

drugs/biologics will also apply, depending on the application type and center overseeing regulation of the combination product, including:

- post-market adverse event and medical device reporting requirements;
- labeling regulations and FDA prohibitions against the promotion of products for uncleared, unapproved or off-label uses;
- advertising and promotion requirements;
- restrictions on sale, distribution or use of the product;
- requirements for recalls being conducted and recall reporting;
- product tracking requirements;
- post-market surveillance or clinical trials; and
- other record-keeping requirements.

Patent Term Restoration

Some of our U.S. patents may be eligible for limited patent term extension under the Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit a patent restoration term of up to five years as compensation for patent term lost during product development and the FDA regulatory review process. However, patent term restoration cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date. The patent term restoration period is generally one-half the time between the effective date of an IND or IDE and the submission date of an NDA, BLA, or PMA, plus the time between the submission date and the approval of that application. Only one patent applicable to an approved product is eligible for the extension and the application for the extension must be submitted prior to the expiration of the patent. The USPTO, in consultation with the FDA, reviews and approves the application for any patent term extension or restoration. Thus, for each approved product, we may apply for restoration of patent term for one of our related owned or licensed patents to add patent life beyond the original expiration date, depending on the expected length of the clinical studies and other factors involved in the filing of the relevant NDA, BLA or PMA.

HIPAA and Other Data Privacy and Security Laws

We are subject to data privacy and security regulations by both the federal government and the states in which we conduct our business. For example, the regulations promulgated under the Health Insurance Portability and Accountability Act of 1996 ("HIPAA"), as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 ("HITECH"), impose privacy, security and breach reporting obligations with respect to protected health information ("PHI") upon "covered entities" (health plans, healthcare clearinghouses and certain healthcare providers), and their respective "business associates," individuals or entities that create, receive, maintain, or transmit PHI in connection with providing a service for or on behalf of a covered entity. Under HIPAA, covered entities must also enter into agreements with their business associates, that require the business associates to protect any PHI provided by the covered entity against improper use or disclosure, amongst other things. Additionally, HITECH mandates the reporting of certain breaches of PHI to the U.S. Department of Health and Human Services ("HHS"), affected individuals, and if the breach is large enough, the media.

HITECH makes specific HIPAA privacy and security requirements directly applicable to business associates. We are both a covered entity and a business associate of our covered entity customers and collaborators. Under the terms of the business associate agreements into which we have entered, we have certain obligations regarding the use and disclosure of any PHI that may be provided to us, and we could incur significant liability if we do not meet such obligations.

HHS promulgated various requirements under HIPAA with which we must comply. HHS rules define standards for electronic transactions, which establish standards for common healthcare transactions, such as claims information, plan eligibility, payment information, and the use of electronic signatures. We must also follow standards for the privacy of PHI, which limit use and disclosure of most written and oral communications, including those in electronic form, regarding a patient's past, present or future physical or mental health or condition, healthcare provided to the individual or payment for that healthcare, if the individual may be identified from such information. In addition, HIPAA's security standards require us to ensure the confidentiality, integrity, and availability of all electronic PHI we create, receive, maintain, or transmit, to protect against reasonably anticipated threats or hazards to the security of such information and to protect such information from unauthorized use or disclosure.

There are significant civil and criminal fines and other penalties that may be imposed for violating HIPAA. A covered entity or business associate is also liable for civil money penalties for a violation that is based on an act or omission of any of its agents, which may include a downstream business associate, as determined according to the federal common law of agency. HITECH also increased the civil and criminal penalties applicable to covered entities and business associates and gave state attorneys general new authority to

file civil actions for damages or injunctions in federal courts to enforce HIPAA and seek attorneys' fees and costs associated with pursuing federal civil actions. To the extent that we submit electronic healthcare claims and payment transactions that do not comply with the electronic data transmission standards established under HIPAA and HITECH, payments to us may be delayed or denied.

Moreover, various state and non-U.S. laws and regulations, such as California's Confidentiality of Medical Information Act, the California Consumer Privacy Act of 2018 (the "CCPA"), as amended by the California Privacy Rights Act of 2020 (the "CPRA"), and the EU General Data Protection Regulation (Regulation (EU) 2016/679) and related implementing laws in individual EU Member States (collectively, the "GDPR"), as well as the United Kingdom version of the GDPR (which combines the GDPR and the United Kingdom's Data Protection Act 2018) may govern the privacy and security of personal information in certain circumstances. Some of these laws and regulations are more stringent than HIPAA, and many differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts. Failure to comply with these laws, where applicable (some information may be exempt from most of CCPA/CPRA if, for example, subject to HIPAA or California's Confidentiality of Medical Information Act, or may be jurisdictionally limited), can result in investigations, proceedings, or in the imposition of significant civil and/or criminal penalties, private litigation and injunctive restrictions on data processing. Privacy and security laws, regulations, and other obligations are constantly evolving, and we could be exposed to additional obligations, further complicating compliance efforts.

In addition to applicability of HIPAA or other data privacy laws or regulations, failing to take what the Federal Trade Commission ("FTC") perceives to be appropriate steps to keep consumers' personal information secure may result in the FTC bringing a claim that a company has engaged in unfair or deceptive acts or practices in or affecting commerce in violation of Section 5(a) of the Federal Trade Commission Act, (the "FTCA"). The FTC expects a company's data security measures to be reasonable and appropriate in light of the sensitivity and volume of consumer information it holds, the size and complexity of its business, and the cost of available tools to improve security and reduce vulnerabilities. Health information is considered sensitive data that merits stronger safeguards. In addition, state consumer protection laws, which may or may not be modeled on the FTCA, may provide state-law causes of action for allegedly unfair or deceptive acts or practices, among other things, including causes of action for alleged data privacy violations.

There has been increased attention to privacy and data protection issues in the EU as well, with the potential to directly affect our business. The GDPR, which went into effect on May 25, 2018, imposes penalties of up to EUR 20 million (approx. $24 million) or 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher. The GDPR increased responsibility and liability in relation to personal data that we process. It also imposes a number of strict obligations and restrictions on the ability to process (processing includes collection, analysis and transfer of) personal data of individuals, in particular with respect to health data from clinical trials and adverse event reporting. The GDPR includes requirements relating to the legal basis of the processing (such as consent of the individuals to whom the personal data relates), the information provided to the individuals prior to processing their personal data, the notification obligations to the national data protection authorities, and the security and confidentiality of the personal data. EU Member States may also impose additional requirements in relation to the health, genetic and biometric data through their national legislation. In addition, the GDPR imposes specific restrictions on the transfer of personal data to countries outside of the EU that are not considered by the European Commission as providing an adequate level of data protection. Appropriate safeguards are required to enable such transfers. Among the appropriate safeguards that can be used, the data exporter may use the standard contractual clauses ("SCCs"). When relying on SCCs, the data exporters are also required to conduct a transfer risk assessment to verify if anything in the law and/or practices of the third country may impinge on the effectiveness of the SCCs in the context of the transfer at stake and, if so, to identify and adopt supplementary measures that are necessary to bring the level of protection of the data transferred to the EU standard of essential equivalence. Where no supplementary measure is suitable, the data exporter should avoid, suspend or terminate the transfer. Regarding data transfers to the United States, the European Commission published an adequacy decision and the new EU-U.S. Data Privacy Framework entered into force on June 10, 2023. However, the adequacy decision only covers data transfers to U.S. companies which are certified under the EU-U.S. Data Privacy Framework.

Environmental Matters

Our operations require the use of hazardous materials (including biological materials), which materials subject us to a variety of federal, state, and local environmental and safety laws and regulations. Some of these laws and regulations provide for strict liability, potentially holding a party liable without regard to fault or negligence. We could be held liable for damages and fines as a result of our, or others', business operations should contamination of the environment or individual exposure to hazardous materials occur. We cannot predict how new, or changes in, laws or regulations will affect our business, operations, or the cost of compliance.

Employees

As of December 31, 2023, we had 58 employees, all of whom were full-time employees. None of our employees are represented by a labor union or covered by a collective bargaining agreement with respect to his or her employment with us. We consider our relationship with our employees to be good.

Matters Related to Discontinued Laboratory Operations

Our historical operations included a licensed Clinical License Improvement Amendment ("CLIA") and College of American Pathologists ("CAP") certified laboratory located in Michigan specializing in the molecular testing markets serving women's health providers in the obstetric, gynecological, fertility, and maternal fetal medicine specialty areas in the United States. Previously, this core laboratory business was focused on the prenatal carrier screening and noninvasive prenatal test market, targeting preconception planning and routine pregnancy management for genetic disease risk assessment. Through our prior affiliation with Mattison Pathology, LLP, a Texas limited liability partnership doing business as Avero Diagnostics ("Avero"), located in Lubbock and Dallas, Texas, our operations also included anatomic and molecular pathology testing products in the United States.

In June 2021, we announced a strategic transformation ("Strategic Transformation") that included the closure of our genetics lab in Ann Arbor, Michigan and the sale of our affiliated Avero laboratory business in December 2021, together referred to as the Laboratory Operations. We have reported all revenues and expenses associated with our Laboratory Operations as discontinued operations in the consolidated financial statements. See Note 3 to our audited consolidated financial statements for additional information on the Laboratory Operations.

Preeclampsia

We had historically been developing a rule-out test for preeclampsia, branded as the Preecludia™ test, as part of our discontinued Laboratory Operations. In connection with our Strategic Transformation, we deprioritized this project and discontinued further investment in its development. In November 2022, we licensed the Preecludia™ test to Northwest Pathology, doing business as Avero Diagnostics for commercial development in exchange for commercial milestone payments and royalties on net sales.

Single-Molecule Detection

Historically, we also had been developing a novel, single-molecule counting assay, initially for use in noninvasive prenatal testing, but potentially applicable to other known genomic, epigenomic, and proteomic targets, as part of our discontinued Laboratory Operations. In connection with our Strategic Transformation, we deprioritized this project and discontinued further investment in its development. In May 2022, we completed the divesture of the single-molecule detection platform and contributed all assets related to the platform to newly formed Enumera Molecular, Inc. ("Enumera"), which intends to develop and commercialize the platform. We received a minority ownership stake in Enumera in exchange for the assets and subsequently, in March 2024 we sold that minority ownership stake.

Reimbursement

Prior to the discontinuation of our Laboratory Operations, we operated clinical laboratories. Laboratory tests are classified for reimbursement purposes under a coding system known as Current Procedure Terminology ("CPT"), which labs and their physician customers must use to bill payors and to receive payment for molecular tests. These CPT codes are associated with the particular molecular test that we have provided to the patient. Once the American Medical Association establishes a CPT code, the Centers for Medicare and Medicaid Services ("CMS") or its contractors may establish payment levels and coverage rules with respect to our molecular tests under Medicare and Medicaid. In addition, commercial third-party payors independently establish reimbursement rates and coverage rules for our molecular tests under their respective plans.

Prior to the discontinuation of our Laboratory Operations, we submitted for reimbursement using CPT codes that we believe are appropriate for our testing, but codes may be rejected or withdrawn and payors may seek refunds of amounts that they claim were inappropriately billed to a specified CPT code.

We received small amounts of revenue in 2022 and 2023 in connection with the reimbursement for tests that were run prior to the closure of our Ann Arbor lab through September 2022.

Discontinued Laboratory Operations Payor Dispute

On November 16, 2020, we received a letter from Anthem, Inc. ("Anthem"), informing us that Anthem was seeking recoupment for historical payments made by Anthem in an aggregate amount of approximately $27.4 million. The historical payments for which Anthem was seeking recoupment were claimed to relate primarily to discontinued legacy billing practices for our former non-invasive prenatal tests ("NIPT") and microdeletion tests and secondarily to the implementation of the new CPT code for reimbursement for our former Preparent expanded carrier screening tests.

We disputed this claim of recoupment with Anthem in full, with offsets for amounts owed by Anthem to us. We had previously established an accrual for the estimated probable loss for this matter. During the year ended December 31, 2022, we reversed this

accrual for a portion of the matter, and during the year ended December 31, 2023 for the remainder of the matter, in view of applicable statute of limitations, and have reflected this change in revenues from discontinued operations.

Corporate Information

We were incorporated in Delaware in January 2012 under the name Ascendant MDx, Inc.. In August 2013, we changed our name to Progenity, Inc., and in April 2022, we changed our name to Biora Therapeutics, Inc. Through our predecessor, Ascendant MDx, a California corporation, we commenced our operations in 2010. Our principal executive offices are located at 4330 La Jolla Village Drive, Suite 300, San Diego, CA 92122, and our telephone number is (833) 727-2841. Our website is www.bioratherapeutics.com. Information contained on or accessible through our website is not a part of this Annual Report, and the inclusion of our website address in this Annual Report is an inactive textual reference only.

We file electronically with the Securities and Exchange Commission (the "SEC") our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). We make available on our website at www.bioratherapeutics.com, under “Investors,” free of charge, copies of these reports as soon as reasonably practicable after filing or furnishing these reports with the SEC.

Implications of Being an Emerging Growth Company and a Smaller Reporting Company

We are an emerging growth company, as defined in Section 2(a) of the Securities Act of 1933, as amended, or the Securities Act, as modified by the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, and we may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including relief from the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended, less extensive disclosure obligations regarding executive compensation in our registration statements, periodic reports and proxy statements, exemptions from the requirements to hold a nonbinding advisory vote on executive compensation, and exemptions from stockholder approval of any golden parachute payments not previously approved. We may also elect to take advantage of other reduced reporting requirements in future filings. As a result, our stockholders may not have access to certain information that they may deem important and the information that we provide to our stockholders may be different than, and not comparable to, information presented by other public reporting companies. We could remain an emerging growth company until the earlier of (1) the last day of the year following the fifth anniversary of the completion of our initial public offering ("IPO"), (2) the last day of the year in which we have total annual gross revenue of at least $1.235 billion, (3) the last day of the year in which we are deemed to be a “large accelerated filer” as defined in Rule 12b-2 under the Exchange Act, which would occur if the market value of our common stock held by non-affiliates exceeded $700.0 million as of the last business day of the second fiscal quarter of such year or (4) the date on which we have issued more than $1.0 billion in non-convertible debt securities during the prior three-year period.

In addition, the JOBS Act also provides that an emerging growth company may take advantage of the extended transition period provided in the Securities Act for complying with new or revised accounting standards. An emerging growth company may therefore delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have elected to avail ourselves of this exemption and, as a result, will not be subject to the same implementation timing for new or revised accounting standards as are required of other public companies that are not emerging growth companies, which may make comparison of our consolidated financial information to those of other public companies more difficult.

We are also a smaller reporting company, as defined in the Exchange Act. We may continue to be a smaller reporting company even after we are no longer an emerging growth company. We may take advantage of certain of the scaled disclosures available to smaller reporting companies and will be able to take advantage of these scaled disclosures for so long as (i) our voting and non-voting common stock held by non-affiliates is less than $250.0 million measured on the last business day of our second fiscal quarter or (ii) our annual revenue is less than $100.0 million during the most recently completed fiscal year and our voting and non-voting common stock held by non-affiliates is less than $700.0 million measured on the last business day of our second fiscal quarter.

Item 1A. Risk Factors.

Investing in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties described below, together with all of the other information in this Annual Report on Form 10-K, including "Management's Discussion & Analysis" and the financial statements and related notes, before deciding to make an investment decision with respect to shares of our common stock. If any of the following risks actually occurs, our business, financial condition, operating results, reputation, and prospects could be materially and adversely affected. In that event, the price of our common stock could decline and you could lose part or all of your investment. We caution you that the risks, uncertainties and other factors referred to below and elsewhere in this Annual Report on Form 10-K may not contain all of the risks, uncertainties and other factors that may affect our future results and operations. Moreover, new risks will emerge from time to time. It is not possible for our management to predict all risks. In this "Risk Factors" section, unless the context requires otherwise, references to "we," "us," "our," "Biora," "Biora Therapeutics" or the "company" refer to Biora Therapeutics, Inc. and its subsidiaries.

Risk Factor Summary

- We have incurred losses in the past, expect to incur losses in the future, have limited capital resources as disclosed in this Annual Report, and may not be able to continue operations or achieve or sustain profitability in the future.
- Operating our business will require a significant amount of cash, and our ability to generate sufficient cash depends on many factors, some of which are beyond our control. An adverse judgment and/or significant damage award against us resulting from our pending litigation matters that we are currently defending would negatively impact our financial position and our ability to raise additional capital. We expect to need to raise additional capital, and if we cannot raise additional capital when needed, we may have to curtail or cease operations.
- We rely on a limited number of suppliers or, in some cases, single suppliers, and may not be able to find replacements or immediately transition to alternative suppliers on a cost-effective basis, or at all.
- The manufacturing of our therapeutics product candidates, and other products under development, is highly exacting and complex, and we depend on third parties to supply materials and manufacture certain products and components.
- We operate in a highly competitive business environment.
- Our success depends on our ability to develop new product candidates, which is complex and costly and the results are uncertain.
- We are still developing our therapeutics pipeline and are in the early stages of its development, have conducted some early preclinical studies, and limited early clinical studies, and to date have generated no therapeutics products or product revenue. There can be no assurance that we will develop any therapeutics products that deliver therapeutic solutions, or, if developed, that such product candidates will be authorized for marketing by regulatory authorities, or will be commercially successful. This uncertainty makes it difficult to assess our future prospects and financial results.
- Our outstanding debt, and any new debt, may impair our financial and operating flexibility.
- We may not be able to obtain and maintain the third-party relationships that are necessary to develop, fund, commercialize, and manufacture some or all of our product candidates.
- If third-party payors do not adequately reimburse for our products under development, they might not be purchased or used, which may adversely affect our revenue and profitability.
- If we or our commercial partners act in a manner that violates healthcare laws or otherwise engage in misconduct, we could face substantial penalties and damage to our reputation, and our business operations and financial condition could be adversely affected.
- New third-party claims of intellectual property infringement could result in litigation or other proceedings, which would be costly and time-consuming, and could limit our ability to commercialize our products.
- We may fail to qualify for continued listing on Nasdaq , which could make it more difficult for our stockholders to sell their shares.

Risks Related to Our Business and Industry

We have incurred losses in the past, expect to incur losses in the future, have limited capital resources as disclosed in this Annual Report, and may not be able to continue operations or achieve or sustain profitability in the future.

We expect to incur significant costs in connection with the development, approval, and commercialization of our products under development. Even if we succeed in creating such product candidates from these investments, those innovations still may fail to result in commercially successful products.

Other than potential revenues from partnerships similar to those we have entered into in the past, we do not expect to generate significant revenues in the immediate future. We do not expect to generate sufficient revenue to cover our costs for the foreseeable future, including research and development and clinical study expenses related to furthering our product pipeline, and expect to incur losses in the future. We may not generate significant revenue in the future until we are able to achieve commercialization of our product candidates or enter into licensing or collaboration agreements with respect to such product candidates.

Since we or any collaborators or licensees may not successfully develop product candidates, obtain required regulatory authorizations, manufacture products at an acceptable cost or with appropriate quality, or successfully market and sell such product candidates with desired margins, our expenses may continue to exceed any revenues we may receive. Our operating expenses also will increase as and if, among other things:

- our earlier-stage product candidates move into later-stage clinical development, which is generally more expensive than early stage development;
- additional technologies or products are selected for development;
- we pursue development of our product candidates for new uses;
- we increase the number of patents we are prosecuting or otherwise expend additional resources on patent prosecution or defense; or
- we acquire or in-license additional technologies, product candidates, products, or businesses.

Given our limited capital resources as disclosed elsewhere in the Annual Report, if we are not able to raise additional capital or generate revenue to fund our operations, we may not be able to continue operations or achieve or sustain profitability in the future.

Operating our business will require a significant amount of cash, and our ability to generate sufficient cash depends on many factors, some of which are beyond our control. An adverse judgment and/or significant damage award against us resulting from our pending litigation matters that are currently defending would negatively impact our financial position and our ability to raise additional capital. We expect to need to raise additional capital, and if we cannot raise additional capital when needed, we may have to curtail or cease operations.

We expect to incur significant costs in connection with our operations, including, but not limited to, the research and development, marketing authorization, and/or commercialization of new medical devices, therapeutics, and other products. These development activities generally require a substantial investment before we can determine commercial viability, and the proceeds from our offerings to date will not be sufficient to fully fund these activities. In addition, as a result of the Strategic Transformation, our revenue has been substantially eliminated. We will need to raise additional funds through public or private equity or debt financings, collaborations, licensing arrangements or sales of assets to continue to fund or expand our operations. Following the Strategic Transformation, we no longer generate revenue from our historical testing business, and we would be dependent on such additional sources of capital, including public or private equity or debt financings, collaborations, licensing arrangements or sales of assets for all of our future capital requirements if we do not achieve commercialization of our product candidates.

Our actual liquidity and capital funding requirements will depend on numerous factors, including:

- the scope and duration of and expenditures associated with our discovery efforts and research and development programs for our therapeutics pipeline;
- the costs to fund our commercialization strategies for any product candidates for which we receive marketing authorization or otherwise launch and to prepare for potential product marketing authorizations, as required;
- the costs of any acquisitions of complementary businesses or technologies that we may pursue;
- potential licensing or partnering transactions, if any;
- our facilities expenses, which will vary depending on the time and terms of any facility lease or sublease we may enter

into, and other operating expenses;

- the scope and extent of any future sales and marketing efforts;
- pending and potential litigation and any resulting adverse judgments, damages, awards or liabilities, potential payor recoupments of reimbursement amounts as related to our historical testing business, and other contingencies;
- the commercial success of our future products;
- the termination costs associated with our Strategic Transformation; and
- any proceeds from strategic transactions.

The availability of additional capital, whether from private capital sources (including banks) or the public capital markets, fluctuates as our financial condition and market conditions in general change. There may be times when the private capital sources and the public capital markets lack sufficient liquidity or when our securities cannot be sold at attractive prices, or at all, in which case we would not be able to access capital from these sources. In addition, a weakening of our financial condition, a further decline in our share price or a deterioration in our credit ratings could adversely affect our ability to obtain necessary funds. Even if available, additional financing could be costly or have adverse consequences.

Additional capital, if needed, may not be available on satisfactory terms or at all. Our ability to raise capital in the public capital markets, including through “at the market” offerings pursuant to our At Market Issuance Sales Agreement with B. Riley Securities, Inc., BTIG, LLC, and H.C. Wainwright & Co. LLC (the "ATM Facility"), may be limited by, among other things, SEC rules and regulations impacting the eligibility of smaller companies to use Form S-3 for primary offerings of securities. Although alternative public and private transaction structures may be available, these may require additional time and cost, may impose operational restrictions on us, and may not be available on attractive terms.

Furthermore, any additional capital raised through the sale of equity or equity-linked securities, including through our ATM Facility, will dilute our stockholders’ ownership interests and may have an adverse effect on the price of our common stock. In addition, the terms of any financing may adversely affect stockholders’ holdings or rights. Debt financing, if available, may include restrictive covenants. To the extent that we raise additional funds through collaborations and licensing arrangements, it may be necessary to relinquish some rights to our technologies or grant licenses on terms that may not be favorable to us.

To minimize dilution to our equity holders, we are also exploring non-dilutive financing options, which could include licenses or collaborations and/or sales of certain assets or business lines. To the extent that we raise additional funds through collaborations and licensing arrangements, it may be necessary to relinquish some rights to our technologies or grant licenses on terms that may not be favorable to us. To the extent that we raise additional funds through strategic transactions, including a sale of one of our lines of business, we may not ultimately realize the value of or synergies from such transactions and our long-term prospects could be diminished as a result of the divestiture of these assets. We may also be required to use some or all of these sale proceeds to pay down indebtedness, which would then not serve to increase our working capital.

If we are not able to obtain adequate funding when needed, we may be required to delay development programs or other initiatives. If we are unable to raise additional capital in sufficient amounts or on satisfactory terms, we may have to make reductions in our workforce and may be prevented from continuing our discovery, development, and commercialization efforts and exploiting other corporate opportunities. In addition, it may be necessary to work with a partner on one or more of our product candidates, which could reduce the economic value of those products to us. If we engage in strategic transactions with respect to revenue-producing assets or business lines, our revenue may be adversely affected and such transactions could negatively affect the viability of our business. Each of the foregoing may harm our business, operating results, and financial condition, and may impact our ability to continue as a going concern.

We maintain our cash at financial institutions, often in balances that exceed federally insured limits. The failure of financial institutions could adversely affect our ability to pay our operational expenses or make other payments.

Our cash held in non-interest-bearing and interest-bearing accounts exceeds the Federal Deposit Insurance Corporation (“FDIC”) insurance limits. If such banking institutions were to fail, we could lose all or a portion of those amounts held in excess of such insurance limitations. For example, the FDIC took control of Silicon Valley Bank on March 10, 2023. The Federal Reserve subsequently announced that account holders would be made whole. However, the FDIC may not make all account holders whole in the event of future bank failures. In addition, even if account holders are ultimately made whole with respect to a future bank failure, account holders’ access to their accounts and assets held in their accounts may be substantially delayed. Any material loss that we may experience in the future or inability for a material time period to access our cash and cash equivalents could have an adverse effect on our ability to pay our operational expenses or make other payments, which could adversely affect our business.

We rely on a limited number of suppliers or, in some cases, single suppliers, and may not be able to find replacements or immediately transition to alternative suppliers on a cost-effective basis, or at all.

We source components of our technology from third parties and certain components are sole sourced. Obtaining substitute components may be difficult or require us to re-design our products under development, including those for which we are required to obtain marketing authorization from the FDA and would need to obtain a new marketing authorization from the FDA to use a new supplier. Any natural or other disasters, acts of war or terrorism, shipping embargoes, labor unrest or political instability or similar events at our third-party manufacturers' facilities that cause a loss of manufacturing capacity or a reduction in the quality or yield of the items manufactured would heighten the risks that we face. For example, our targeted therapeutics device under development includes complex components including circuit boards that have to be built to exacting standards, and the failure of a manufacturer to meet our requirements on time, as we have experienced in the past and continue to experience, could lead to delays in our plans for testing, pre-clinical and clinical studies and other development activities. Changes to, failure to renew or termination of our existing agreements or our inability to enter into new agreements with other suppliers could result in the loss of access to important components of our products under development and could impair, delay or suspend our commercialization efforts. Our failure to maintain a continued and cost-effective supply of high-quality components could materially and adversely harm our business, operating results, and financial condition.

The manufacturing of our therapeutics product candidates, and other products under development, is highly exacting and complex, and we depend on third parties to supply materials and manufacture certain products and components.

Manufacturing is highly exacting and complex due, in part, to strict regulatory requirements governing the manufacture of our future products and product candidates, including medical devices with complex components, including but not limited to, circuit boards and pharmaceutical products. We have limited personnel with experience in, and we do not own facilities for, manufacturing any products. We depend upon our collaborators and other third parties, including sole source suppliers, to provide raw materials meeting FDA quality standards and related regulatory requirements, manufacture devices, and drug substances, produce drug products and provide certain analytical services with respect to our products and product candidates. The FDA and other regulatory authorities require that many of our products be manufactured according to cGMP regulations and that proper procedures be implemented to assure the quality of our sourcing of raw materials and the manufacture of our products. Any failure by us, our collaborators, or our third-party manufacturers to comply with cGMP and/or scale-up manufacturing processes could lead to a delay in, or failure to obtain, marketing authorizations. In addition, such failure could be the basis for action by the FDA, including issuing a warning letter, initiating a product recall or seizure, fines, imposing operating restrictions, total or partial suspension of production or injunctions and/or withdrawing marketing authorizations for products previously granted to us. To the extent we rely on a third-party manufacturer, the risk of noncompliance with cGMP regulations may be greater and the ability to effect corrective actions for any such noncompliance may be compromised or delayed.

Moreover, we expect that certain of our therapeutics product candidates, including BT-600, BT-001, BT-200, and BT-002, are drug-device combination products that will be regulated under the drug and biological product regulations of the FD&C Act, and PHSA, based on their primary modes of action as drugs and biologics. Third-party manufacturers may not be able to comply with cGMP regulations, applicable to drug-device combination products, including applicable provisions of the FDA's drug and biologics cGMP regulations, device cGMP requirements embodied in the QSR, or similar regulatory requirements outside the United States.

In addition, we or third parties may experience other problems with the manufacturing, quality control, yields, storage or distribution of our products, including equipment breakdown or malfunction, failure to follow specific protocols and procedures, problems with suppliers and the sourcing or delivery of raw materials and other necessary components, problems with software, labor difficulties, and natural disaster-related events or other environmental factors. These problems can lead to increased costs, delays to development and preclinical study timelines, lost collaboration opportunities, damage to collaborator relations, time and expense spent investigating the cause and, depending on the cause, similar losses with respect to other batches of products. For example, our therapeutics devices under development includes complex components including circuit boards that have to be built to exacting standards, and the failure of a manufacturer to meet our requirements on time, as we have experienced in the past and continue to experience, could lead to delays in our plans for testing, pre-clinical and clinical studies and other development activities. If problems are not discovered before the product is released to the market, recalls, corrective actions, or product liability-related costs also may be incurred. Problems with respect to the manufacture, storage, or distribution of products could materially disrupt our business and have a material and adverse effect on our operating results and financial condition.

We may be unable to successfully divest certain assets or recover any of the costs of our investment in certain R&D programs.

In connection with our Strategic Transformation, we have divested certain assets that do not align with our current operational plans and strategies, including the sale of certain laboratory assets and the divesture of Avero. We have explored the potential divestiture and/or out-license of other assets and intellectual property as well. It is possible that we will be unable to successfully divest and/or license these assets, and we may never recover any of the costs of our historical R&D investments.

In May 2022, we completed the divesture of our single-molecule detection platform and contributed all assets related to the single-molecule detection platform to newly formed Enumera, which intends to develop and commercialize the platform. We received a minority ownership stake in Enumera in exchange for the assets. It is possible that the value of our equity stake in Enumera will decrease over time, and it is possible that we may never recover any of the costs of the historical R&D investments related to this platform.

Additionally, in November 2022, we announced that we had signed an agreement to license our Preecludia™ rule-out test for preeclampsia to Northwest Pathology, doing business as Avero Diagnostics ("Northwest") for commercial development in exchange for commercial milestone payments and royalties on net sales. There is no assurance that Northwest will be able to successfully commercialize the test. As a result, there is no assurance that we will receive any payments from the transaction and we may never recover any of the costs of the historical R&D investments related to this program.

We operate in a highly competitive business environment.

The industries in which we operate are highly competitive and require an ongoing, extensive search for technological innovation. They also require, among other things, the ability to effectively develop, test, commercialize, market, and promote products, including communicating the effectiveness, safety, and value of products to actual and prospective healthcare providers. Other competitive factors in our industries include quality and price, product technology, reputation, customer service, and access to technical information.

We expect our future products, if approved, to face substantial competition from major pharmaceutical companies, biotechnology companies, academic institutions, government agencies, and public and private research institutions. The larger competitors have substantially greater financial and human resources, as well as a much larger infrastructure than we do. For more information on our therapeutics competitors, see Part I, Item 1. "Business—Competition."

Additionally, we compete to acquire the intellectual property assets that we require to continue to develop and broaden our product pipeline. In addition to our in-house R&D efforts, we may seek to acquire rights to new intellectual property through corporate acquisitions, asset acquisitions, licensing, and joint venture arrangements. Competitors with greater resources may acquire intellectual property that we seek, and even where we are successful, competition may increase the acquisition price of such intellectual property or prevent us from capitalizing on such acquisitions, licensing opportunities, or joint venture arrangements. If we fail to compete successfully, our growth may be limited.

It is possible that developments by our competitors could make our products or technologies under development less competitive or obsolete. Our future growth depends, in part, on our ability to provide products that are more effective than those of our competitors and to keep pace with rapid medical and scientific change. Sales of any future products may decline rapidly if a new product is introduced by a competitor, particularly if a new product represents a substantial improvement over our products. In addition, the high level of competition in our industry could force us to reduce the price at which we sell our products or require us to spend more to market our products.

Many of our competitors have greater resources than we have. This enables them, among other things, to spread their marketing and promotion costs over a broader revenue base. In addition, we may not be able to compete effectively against our competitors because their products and services are superior. Our current and future competitors could have greater experience, technological and financial resources, stronger business relationships, broader product lines and greater name recognition than us, and we may not be able to compete effectively against them. Increased competition is likely to result in pricing pressures, which could harm our revenues, operating income, or market share. If we are unable to compete successfully, we may be unable to increase or sustain our revenues or achieve or sustain profitability.

Our success depends on our ability to develop new product candidates, which is complex and costly and the results are uncertain.

Effective execution of R&D activities and the timely introduction of new products and product candidates to the market are important elements of our business strategy. However, the development of new products and product candidates is complex, costly, and uncertain and requires us to, among other factors, accurately anticipate patients', clinicians', and payors' needs, and emerging technology trends. For more information on our current R&D efforts, see Part I, Item 1. "Business."

In the development of new products and product candidates, we can provide no assurance that:

- we will develop any products that meet our desired target product profile and address the relevant clinical need or commercial opportunity;
- any products that we develop will prove to be effective in clinical trials, platform validations, or otherwise;

- we will obtain necessary regulatory authorizations, in a timely manner or at all;
- any products that we develop will be successfully marketed to and ordered by healthcare providers;
- any products that we develop will be produced at an acceptable cost and with appropriate quality;
- our current or future competitors will not introduce products similar to ours that have superior performance, lower prices, or other characteristics that cause healthcare providers to recommend, and consumers to choose, such competitive products over ours; or
- third parties do not or will not hold patents in any key jurisdictions that would be infringed by our products.

These and other factors beyond our control could delay our launch of new products and product candidates.

The R&D process in our industries generally requires a significant amount of time from the research and design stage through commercialization. The launch of such new products requires the completion of certain clinical development and/or assay validations in a commercial laboratory. This process is conducted in various stages, and each stage presents the risk that we will not achieve our goals and will not be able to complete clinical development for any planned product in a timely manner. Such development and/or validation failures could prevent or significantly delay our ability to obtain FDA clearance or approval as may be necessary or desired or launch any of our planned products and product candidates. At times, it may be necessary for us to abandon a product in which we have invested substantial resources. Without the timely introduction of new product candidates, our future products may become obsolete over time and our competitors may develop products that are more competitive, in which case our business, operating results, and financial condition will be harmed.

We are still developing our therapeutics pipeline and are in the early stages of its development, have conducted some early preclinical studies, and limited early clinical studies, and to date have generated no therapeutics products or product revenue. There can be no assurance that we will develop any therapeutics products that deliver therapeutic solutions, or, if developed, that such product candidates will be authorized for marketing by regulatory authorities, or will be commercially successful. This uncertainty makes it difficult to assess our future prospects and financial results.

Our operations with respect to our therapeutics pipeline to date have been limited to developing our platform technology, undertaking preclinical studies and feasibility studies with human subjects, and conducting research to identify potential product candidates. To date, we have only conducted limited feasibility studies in humans to evaluate whether our platform localization technology enables identification of the location of our ingestible medical devices within the gastrointestinal tract as well as the function of our devices.

We seek to develop two therapeutic platforms that use ingestible drug-device combination products. However, medical device and related therapeutic product development is a highly speculative undertaking and involves a substantial degree of uncertainty and we are in the early stages of our development programs. Our therapeutics pipeline has not yet demonstrated an ability to generate revenue or successfully overcome many of the risks and uncertainties frequently encountered by companies in new and rapidly evolving fields such as ours. Consequently, the ability to accurately assess the future operating results or business prospects of our therapeutics pipeline is significantly more limited than if we had an operating history or approved commercial therapeutics products. Our success in developing commercial products that are based on our therapeutics pipeline will depend on a variety of factors, many of which are beyond our control, including, but not limited to:

- the outcomes from our product development efforts;
- competition from existing products or new products;
- the timing of regulatory review and our ability to obtain regulatory marketing authorizations of our product candidates;
- potential side effects of our product candidates that could delay or prevent receipt of marketing authorizations or cause an approved or cleared product to be taken off the market;
- our ability to attract and retain key personnel with the appropriate expertise and experience to potentially develop our product candidates; and
- the ability of third-party manufacturers to manufacture our product candidates in accordance with cGMP, for the conduct of clinical trials and, if approved or cleared, for successful commercialization.

Even if we are able to develop one or more commercial therapeutics products, we expect that the operating results of these products will fluctuate significantly from period to period due to the factors above and a variety of other factors, many of which are beyond our control, including, but not limited to:

- market acceptance of our product candidates, if approved or cleared;

- our ability to establish and maintain an effective sales and marketing infrastructure for our products;
- the ability of patients or healthcare providers to obtain coverage or sufficient reimbursement for our products;
- our ability, as well as the ability of any third-party collaborators, to obtain, maintain and enforce intellectual property rights covering our products, product candidates and technologies, and our ability to develop, manufacture and commercialize our products, product candidates, and technologies without infringing on the intellectual property rights of others; and
- our ability to attract and retain key personnel with the appropriate expertise and experience to manage our business effectively.

Accordingly, the likelihood of the success of our therapeutics pipeline must be evaluated in light of these many potential challenges and variables.

The development of new product candidates will require us to undertake clinical trials, which are costly, time-consuming, and subject to a number of risks.

The development of new product candidates, including development of the data necessary for IND submissions and to obtain clearance or approval for such product candidates, is costly, time-consuming, and carries with it the risk of not yielding the desired results. Once filed, our IND submissions may not become effective if the FDA raises concerns with respect to those submissions. Further, the outcome of preclinical studies and early clinical trials may not be predictive of the success of later clinical trials, and interim results of clinical trials do not necessarily predict success in future clinical trials. Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials after achieving positive results in earlier development, and even if we achieve positive results in earlier trials, we could face similar setbacks. The design of a clinical trial can determine whether its results will support a product candidate's marketing authorization, to the extent required, and flaws in the design of a clinical trial may not become apparent until the clinical trial is well advanced. In addition, preclinical and clinical data are often susceptible to varying interpretations and analyses. Many companies that believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing authorization for the product candidates. Furthermore, limited results from earlier-stage studies may not predict results from studies in larger numbers of subjects drawn from more diverse populations over a longer period of time.

Unfavorable results from ongoing preclinical studies and clinical trials could result in delays, modifications, or abandonment of ongoing or future analytical or clinical trials, or abandonment of a product development program, or may delay, limit, or prevent marketing authorizations, where required, or commercialization of our product candidates. Even if we, or our collaborators, believe that the results of clinical trials for our product candidates warrant marketing authorization, the FDA and other regulatory authorities may disagree and may not grant marketing authorizations for our product candidates.

Moreover, the FDA requires us to comply with regulatory standards, commonly referred to as the GCP requirements, for conducting, recording, and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, safety, and welfare of trial participants are protected. Other countries' regulatory agencies also have requirements for clinical trials with which we must comply. We also are required to register certain ongoing clinical trials and post the results of certain completed clinical trials on a government-sponsored database, ClinicalTrials.gov, within specified timeframes. Failure to do so can result in fines, enforcement action, adverse publicity, and civil and criminal sanctions.

The initiation and completion of any clinical studies may be prevented, delayed, or halted for numerous reasons. We may experience delays in initiation or completion of our clinical trials for a number of reasons, which could adversely affect the costs, timing, or success of our clinical trials, including related to the following:

- we may be required to submit an IDE application to the FDA with respect to our medical device product candidates, which must become effective prior to commencing certain human clinical trials of medical devices, and the FDA may reject our IDE application and notify us that we may not begin clinical trials;
- regulators and other comparable foreign regulatory authorities may disagree as to the design or implementation of our clinical trials;
- regulators and/or IRBs or other reviewing bodies may not authorize us or our investigators to commence a clinical trial, or to conduct or continue a clinical trial at a prospective or specific trial site;
- we may not reach agreement on acceptable terms with prospective contract research organizations ("CROs"), and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;

- clinical trials may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical trials or abandon product development programs;
- the number of subjects or patients required for clinical trials may be larger than we anticipate, enrollment in these clinical trials may be insufficient or slower than we anticipate, and the number of clinical trials being conducted at any given time may be high and result in fewer available patients for any given clinical trial, or patients may drop out of these clinical trials at a higher rate than we anticipate;
- our third-party contractors, including those manufacturing products or conducting clinical trials on our behalf, may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all;
- we or our investigators may have to suspend or terminate clinical trials for various reasons, including a finding that the subjects are being exposed to unacceptable health risks or based on a requirement or recommendation from regulators, IRBs or other parties due to safety signals or noncompliance with regulatory requirements;
- we may have to amend clinical trial protocols or conduct additional studies to reflect changes in regulatory requirements or guidance, which we may be required to submit to an IRB and/or regulatory authorities for re-examination;
- the cost of clinical trials may be greater than we anticipate;
- clinical sites may not adhere to the clinical protocol or may drop out of a clinical trial;
- we may be unable to recruit a sufficient number of clinical trial sites;
- regulators, IRBs, or other reviewing bodies may fail to approve or subsequently find fault with our manufacturing processes or facilities of third-party manufacturers with which we enter into agreement for clinical and commercial supplies, the supply of devices or other materials necessary to conduct clinical trials may be insufficient, inadequate or not available at an acceptable cost, or we may experience interruptions in supply;
- marketing authorization policies or regulations of the FDA or applicable foreign regulatory agencies may change in a manner rendering our clinical data insufficient for authorization; and
- our product candidates may have undesirable side effects or other unexpected characteristics.

Any of these occurrences may significantly harm our business, financial condition, and prospects. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates.

Patient enrollment in clinical trials and completion of patient follow-up depend on many factors, including the size of the patient population, the nature of the trial protocol, the proximity of patients to clinical sites, the eligibility criteria for the clinical trial, patient compliance, competing clinical trials and clinicians' and patients' perceptions as to the potential advantages of the product being studied in relation to other available therapies, including any new treatments that may be approved for the indications we are investigating. For example, patients may be discouraged from enrolling in our clinical trials if the trial protocol requires them to undergo extensive post-treatment procedures or follow-up to assess the safety and efficacy of a product candidate, or they may be persuaded to participate in contemporaneous clinical trials of a competitor's product candidate. In addition, patients participating in our clinical trials may drop out before completion of the trial or experience adverse medical events unrelated to our product candidates. Delays in patient enrollment or failure of patients to continue to participate in a clinical trial may delay commencement or completion of the clinical trial, cause an increase in the costs of the clinical trial and delays, or result in the failure of the clinical trial.

Clinical trials must be also conducted in accordance with the laws and regulations of the FDA and other applicable regulatory authorities' legal requirements, regulations or guidelines, and are subject to oversight by these governmental agencies and IRBs at the medical institutions where the clinical trials are conducted. We rely on CROs and clinical trial sites to ensure the proper and timely conduct of our clinical trials and while we have agreements governing their committed activities, we have limited influence over their actual performance. We depend on our collaborators and on medical institutions and CROs to conduct our clinical trials in compliance with the FDA's GCP requirements. To the extent our collaborators or the CROs fail to enroll participants for our clinical trials, fail to conduct the study to GCP requirements, or are delayed for a significant time in the execution of trials, including achieving full enrollment, we may be affected by increased costs, program delays, or both. In addition, clinical trials that are conducted in countries outside the United States may subject us to further delays and expenses as a result of increased shipment costs, additional regulatory requirements and the engagement of non-U.S. CROs, as well as expose us to risks associated with clinical investigators who are unknown to the FDA, and different standards of diagnosis, screening and medical care.

The clinical trial process is lengthy and expensive with uncertain outcomes. We have limited data and experience regarding the safety and efficacy of our product candidates. Results of earlier studies may not be predictive of future clinical trial results, or the safety or efficacy profile for such products or product candidates.

Clinical testing is difficult to design and implement, can take many years, can be expensive, and carries uncertain outcomes. The results of preclinical studies and clinical trials of our products conducted to date and ongoing or future studies and trials of our current, planned, or future products and product candidates may not be predictive of the results of later clinical trials, and interim results of a clinical trial do not necessarily predict final results. Our interpretation of data and results from our clinical trials do not ensure that we will achieve similar results in future clinical trials. In addition, preclinical and clinical data are often susceptible to various interpretations and analyses, and many companies that have believed their products performed satisfactorily in preclinical studies and earlier clinical trials have nonetheless failed to replicate results in later clinical trials. Products in later stages of clinical trials may fail to show the desired safety and efficacy despite having progressed through nonclinical studies and earlier clinical trials. Failure can occur at any stage of clinical testing. Our clinical studies may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical and non-clinical testing in addition to those we have planned.

Interim "top-line" and preliminary data from studies or trials that we announce or publish from time to time may change as more data become available and are subject to audit and verification procedures that could result in material changes in the final data.

From time to time, we may publish interim "top-line" or preliminary data from preclinical studies or clinical trials. Interim data are subject to the risk that one or more of the outcomes may materially change as more data become available. We also make assumptions, estimations, calculations, and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the top-line results that we report may differ from future results of the same studies, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Preliminary or "top-line" data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data we previously published. As a result, interim and preliminary data should be viewed with caution until the final data are available. Additionally, interim data from clinical trials that we may complete are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues and more patient data become available. Adverse differences between preliminary or interim data and final data could seriously harm our business.

Further, others, including regulatory agencies, may not accept or agree with our assumptions, estimates, calculations, conclusions or analyses or may interpret or weigh the importance of data differently, which could impact the value of the particular program, the approvability or commercialization of the particular product candidate or product, and our results of operations, liquidity and financial condition. In addition, the information we choose to publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and others may not agree with what we determine is the material or otherwise appropriate information to include in our disclosure. Any information we determine not to disclose may ultimately be deemed significant by others with respect to future decisions, conclusions, views, activities or otherwise regarding a particular product candidate or our business. If the top-line data that we report differ from final results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain marketing authorization for, and commercialize, product candidates may be harmed, which could seriously harm our business.

The results of our clinical trials may not support the use of our product candidates, or may not be replicated in later studies required for marketing authorizations.

As the healthcare reimbursement system in the United States evolves to place greater emphasis on comparative effectiveness and outcomes data, we cannot predict whether we will have sufficient data, or whether the data we have will be presented to the satisfaction of any payors seeking such data for determining coverage for our products under development, particularly in new areas such as in drug-device combination or therapeutic applications.

The administration of clinical and economic utility studies is expensive and demands significant attention from certain members of our management team. Data collected from these studies may not be positive or consistent with our existing data, or may not be statistically significant or compelling to the medical community or payors. If the results obtained from our ongoing or future studies are inconsistent with certain results obtained from our previous studies, adoption of our products would suffer and our business would be harmed.

Peer-reviewed publications regarding our product candidates may be limited by many factors, including delays in the completion of, poor design of, or lack of compelling data from clinical studies, as well as delays in the review, acceptance, and publication process. If our products under development or the underlying technology do not receive sufficient favorable exposure in peer-reviewed publications, or are not published, the rate of healthcare provider adoption of our products under development and positive reimbursement coverage decisions for our products under development could be negatively affected. The publication of

clinical data in peer-reviewed journals can be a crucial step in commercializing and obtaining reimbursement for products under development, and our inability to control when, if ever, results are published may delay or limit our ability to derive sufficient revenues from any test or other product that is the subject of a study. The performance achieved in published studies might not be repeated in later studies that may be required to obtain FDA clearance or marketing authorizations should we decide for business reasons, or be required to submit applications to the FDA or other health authorities seeking such authorizations.

Our outstanding debt, and any new debt, may impair our financial and operating flexibility.

As of December 31, 2023, we had a face value of approximately $51.1 million of convertible notes outstanding. Certain of our debt agreements contain various restrictive covenants.

The indentures for our Convertible Notes prohibit us and our subsidiaries from incurring additional indebtedness in the future, with certain exceptions. Under the Convertible Notes, we will not, and we will not permit any subsidiary of ours to, create, incur, assume or permit to exist any lien on any property or asset now owned or later acquired by us or any subsidiary that secures any indebtedness for borrowed money, other than (i) secured indebtedness for borrowed money in existence on the date of the Indenture; (ii) permitted refinancing indebtedness incurred in exchange for, or the net proceeds of which are used to renew, refund, refinance, replace, defease or discharge any secured indebtedness for borrowed money permitted by clause (i) of this sentence; and (iii) additional subordinated indebtedness for borrowed money that, in an aggregate principal amount (or accredited value, as applicable), does not exceed $10.0 million at any time outstanding.

Accordingly, we may incur additional indebtedness in the future. Our current indebtedness and the incurrence of additional indebtedness could have significant negative consequences for our stockholders and our business, results of operations and financial condition by, among other things:

- making it more difficult for us to satisfy our obligations under our existing debt instruments;
- increasing our vulnerability to general adverse economic and industry conditions;
- limiting our ability to obtain additional financing to fund our research, development, and commercialization activities, particularly when the availability of financing in the capital markets is limited;
- requiring a substantial portion of our cash flows from operations for the payment of principal and interest on our debt, reducing our ability to use our cash flows to fund working capital, research and development, and other general corporate requirements;
- limiting our flexibility to plan for, or react to, changes in our business and the industries in which we operate;
- further diluting our current stockholders as a result of issuing shares of our common stock upon conversion of our Convertible Notes; and
- placing us at a competitive disadvantage with competitors that are less leveraged than us or have better access to capital.

Our ability to make principal and interest payments will depend on our ability to generate cash in the future. Our business may not generate sufficient funds, and we may otherwise be unable to maintain sufficient cash reserves, to pay amounts due under our indebtedness, and our cash needs may increase in the future. If we do not generate sufficient cash to meet our debt service requirements and other operating requirements, we may need to seek additional financing. In that case, it may be more difficult, or we may be unable, to obtain financing on terms that are acceptable to us or at all.

In addition, any future indebtedness that we may incur may contain financial and other restrictive covenants that limit our ability to operate our business, raise capital or make payments under our other indebtedness. If we fail to comply with these covenants or to make payments under our indebtedness when due, then we would be in default under that indebtedness, which could, in turn, result in that and our other indebtedness becoming immediately payable in full.

Actual or perceived failures to comply with applicable data protection, privacy, consumer protection and security laws, regulations, standards and other requirements could adversely affect our business, results of operations, and financial condition.

The global data protection landscape is rapidly evolving, and we are or may become subject to numerous state, federal, and foreign laws, requirements, and regulations governing the collection, use, disclosure, retention, and security of personal information. Implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future, and we cannot yet determine the impact future laws, regulations, standards, or perception of their requirements may have on our business. This evolution may create uncertainty in our business, affect our ability to operate in certain jurisdictions or to collect, store, transfer, use and share personal information, necessitate the acceptance of more onerous obligations in our contracts, result in liability or impose additional

costs on us. The cost of compliance with these laws, regulations, and standards is high and is likely to increase in the future. Any failure or perceived failure by us to comply with federal, state or foreign laws or regulations, our internal policies and procedures or our contracts governing our processing of personal information could result in negative publicity, government investigations and enforcement actions, claims by third parties and damage to our reputation, any of which could have a material adverse effect on our operations, financial performance and business.

As our operations and business grow, we may become subject to or affected by new or additional data protection laws and regulations and face increased scrutiny or attention from regulatory authorities. In the United States, the manner in which we collect, use, access, disclose, transmit and store PHI, is subject to HIPAA, as amended by HITECH, and the health data privacy, security and breach notification regulations issued pursuant to these statutes.

HIPAA establishes a set of national privacy and security standards for the protection of PHI, by health plans, healthcare clearinghouses, and certain healthcare providers, referred to as covered entities, and the business associates with whom such covered entities contract for services that involve the use or disclosure of PHI. HIPAA requires healthcare providers like us to develop and maintain policies and procedures with respect to PHI that is used or disclosed, including the adoption of administrative, physical, and technical safeguards to protect such information.

HIPAA further requires covered entities to notify affected individuals "without unreasonable delay and in no case later than 60 calendar days after discovery of the breach" if their unsecured PHI is subject to unauthorized access, use or disclosure. If a breach affects 500 patients or more, covered entities must report it to HHS and local media without unreasonable delay (and in no case later than 60 days after discovery of the breach), and HHS will post the name of the entity on its public website. If a breach affects fewer than 500 individuals, the covered entity must log it and notify HHS at least annually. HIPAA also implemented the use of standard transaction code sets and standard identifiers that covered entities must use when submitting or receiving certain electronic healthcare transactions, including activities associated with the billing and collection of healthcare claims.

Penalties for failure to comply with a requirement of HIPAA and HITECH vary significantly depending on the failure and could include requiring corrective actions, and/or imposing civil monetary or criminal penalties. HIPAA also authorizes state attorneys general to file suit under HIPAA on behalf of state residents. Courts can award damages, costs and attorneys' fees related to violations of HIPAA in such cases. While HIPAA does not create a private right of action allowing individuals to sue us in civil court for HIPAA violations, its standards have been used as the basis for a duty of care claim in state civil suits such as those for negligence or recklessness in the misuse or breach of PHI.

Certain states have also adopted comparable privacy and security laws and regulations, some of which, such as California's Confidentiality of Medical Information Act, may be more stringent than HIPAA. Such laws and regulations will be subject to interpretation by various courts and other governmental authorities, thus creating potentially complex compliance issues for us and our future customers and strategic partners.

In addition, depending on the information at issue, comprehensive state privacy laws may apply as well, such as the CCPA, which went into effect on January 1, 2020 and was amended by the CPRA, which went into effect on January 1, 2023. The CPRA creates individual privacy rights for California consumers and increases the privacy and security obligations of entities handling certain personal data. The CPRA provides for civil penalties for violations, as well as a private right of action for data breaches that could increase data breach litigation. The CPRA may increase our compliance costs and potential liability, and many similar laws have been proposed at the federal level and proposed or enacted in other states. Any liability from failure to comply with the requirements of these laws could adversely affect our financial condition. Various state data breach laws may require additional notification requirements in the event of a breach, as well, depending on the types of information accessed without authorization.

Although we work to comply with applicable laws, regulations and standards, our contractual obligations and other legal obligations, these requirements are evolving and may be modified, interpreted and applied in an inconsistent manner from one jurisdiction to another, and may conflict with one another or other legal obligations with which we must comply. Any failure or perceived failure by us or our employees, representatives, contractors, consultants, CROs, collaborators, or other third parties to comply with such requirements or adequately address privacy and security concerns, even if unfounded, could result in additional cost and liability to us, damage our reputation, and adversely affect our business and results of operations.

Security breaches, loss of data, and other disruptions could compromise sensitive information related to our business or prevent us from accessing critical information and expose us to liability, which could adversely affect our business and reputation.

In the ordinary course of our business, including our now discontinued historical testing business, we collect and store sensitive data, including PHI (such as patient medical records, including test results), and personally identifiable information. We also store

business and financial information, intellectual property, R&D information, trade secrets and other proprietary and business critical information, including that of our customers, payors, and collaboration partners. We manage and maintain our data utilizing a combination of on-site systems, managed data center systems and cloud-based data center systems. We are highly dependent on information technology networks and systems, including the internet, to securely process, transmit, and store critical information. Although we take measures to protect sensitive information from unauthorized access or disclosure, our information technology and infrastructure, and that of our third-party billing and collections provider and other service providers, may be vulnerable to attacks by hackers, viruses, disruptions and breaches due to employee error or malfeasance.

A security breach or privacy violation that leads to unauthorized access, disclosure or modification of, or prevents access to, personal information, including PHI, could compel us to comply with state and federal breach notification laws, subject us to mandatory corrective action and require us to verify the correctness of database contents. Such a breach or violation also could result in legal claims or proceedings brought by a private party or a governmental authority, liability under laws and regulations that protect the privacy of personal information, such as HIPAA, HITECH, and laws and regulations of various U.S. states and foreign countries, as well as penalties imposed by the Payment Card Industry Security Standards Council for violations of the Payment Card Industry Data Security Standard. If we are unable to prevent such security breaches or privacy violations or implement satisfactory remedial measures, we may suffer loss of reputation, financial loss and civil or criminal fines or other penalties because of lost or misappropriated information. In addition, these breaches and other forms of inappropriate access can be difficult to detect, and any delay in identifying them may lead to increased harm of the type described above.

Unauthorized access, loss or dissemination of information could disrupt our operations, including our ability to process claims and appeals, provide customer assistance services, conduct R&D activities, develop and commercialize products, collect, process and prepare company financial information, provide information about products, and manage the administrative aspects of our business, any of which could damage our reputation and adversely affect our business. Any breach could also result in the compromise of our trade secrets and other proprietary information, which could adversely affect our competitive position.

In addition, health-related, privacy, and data protection laws and regulations in the United States and elsewhere are subject to interpretation and enforcement by various governmental authorities and courts, resulting in complex compliance issues and the potential for varying or even conflicting interpretations, particularly as laws and regulations in this area are in flux. It is possible that these laws may be interpreted and applied in a manner that is inconsistent with our practices. If so, this could result in government-imposed fines or orders requiring that we change our practices, which could adversely affect our business and our reputation. Complying with these laws could cause us to incur substantial costs or require us to change our business practices and compliance procedures in a manner adverse to our business, operating results, and financial condition.

Any failure or perceived failure by us or any third-party collaborators, service providers, contractors or consultants to comply with our privacy, confidentiality, data security or similar obligations, or any data security incidents or other security breaches that result in the accidental, unlawful or unauthorized access to, use of, release of, processing of, or transfer of sensitive information, including personal information, may result in negative publicity, harm to our reputation, governmental investigations, enforcement actions, regulatory fines, litigation or public statements against us, could cause third parties to lose trust in us or could result in claims by third parties, including those that assert that we have breached our privacy, confidentiality, data security or similar obligations, any of which could have a material adverse effect on our reputation, business, financial condition or results of operations. We could be subject to fines and penalties (including civil and criminal) under HIPAA for any failure by us or our business associates to comply with HIPAA's requirements. Moreover, data security incidents and other security breaches can be difficult to detect, and any delay in identifying them may lead to increased harm. While we have implemented data security measures intended to protect our information, data, information technology systems, applications and infrastructure, there can be no assurance that such measures will successfully prevent service interruptions or data security incidents.

If we lose the services of members of our senior management team or other key employees, we may not be able to execute our business strategy.

Our success depends in large part upon the continued service of our senior management team and certain other key employees who are important to our vision, strategic direction, and culture. Our current long-term business strategy was developed in large part by our senior management team and depends in part on their skills and knowledge to implement. We may not be able to offset the impact on our business of the loss of the services of any member of our senior management or other key officers or employees or attract additional talent. The loss of any members of our senior management team or other key employees could have a material and adverse effect on our business, operating results, and financial condition.

An inability to attract and retain highly skilled employees could adversely affect our business.

To execute our business plan, we must attract and retain highly qualified personnel. Competition for qualified personnel is intense, especially for personnel in our industry and especially in the areas where our facilities are located. We have from time to time

experienced, and we expect to continue to experience, difficulty in hiring and retaining employees with appropriate qualifications. Many of the companies with which we compete for experienced personnel have greater resources than we have. If we hire employees from competitors or other companies, their former employers may attempt to assert that these employees have breached their legal obligations to their former employees, resulting in a diversion of our time and resources. In addition, job candidates and existing employees often consider the value of the stock awards they receive in connection with their employment. If the perceived value of our stock awards declines, it may adversely affect our ability to attract and retain highly skilled employees. If we fail to attract new personnel or fail to retain and motivate our current personnel, our business, operating results, and financial condition could be adversely affected.

We may not be able to obtain and maintain the third-party relationships that are necessary to develop, fund, commercialize, and manufacture some or all of our product candidates.

We expect to depend on collaborators, partners, licensees, manufacturers, and other third parties to support our product candidate development efforts, including, to manufacture our product candidates and to market, sell, and distribute any products we successfully develop. Any problems we experience with any of these third parties could delay the development, commercialization, and manufacturing of our product candidates, which could harm our results of operations.

We cannot guarantee that we will be able to successfully negotiate agreements for, or maintain relationships with, collaborators, partners, licensees, manufacturers, and other third parties on favorable terms, if at all. If we are unable to obtain or maintain these agreements, we may not be able to clinically develop, manufacture, obtain regulatory authorizations for, or commercialize any future product candidates, which will in turn adversely affect our business.

We expect to expend substantial management time and effort to enter into relationships with third parties and, if we successfully enter into such relationships, to manage these relationships. In addition, substantial amounts will be paid to third parties in these relationships. However, we cannot control the amount or timing of resources our future contract partners will devote to our R&D programs and products under development, and we cannot guarantee that these parties will fulfill their obligations to us under these arrangements in a timely fashion, if at all. In addition, while we manage the relationships with third parties, we cannot control all of the operations of and protection of intellectual property with respect to such third parties.

We rely on third parties for matters related to the design of our product candidates and for our preclinical research and clinical trials, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such preclinical research and trials.

We rely and expect to continue to rely on third parties, such as engineering firms, CROs, clinical data management organizations, medical institutions, and clinical investigators, to conduct and manage certain aspects of the design, preclinical testing, and clinical trials for our products under development. Our reliance on these third parties for R&D activities reduces our control over these activities but does not relieve us of our responsibilities. For example, we remain responsible for ensuring that each of our clinical trials is conducted in accordance with GCP requirements, the general investigational plan, and the protocols established for such trials.

These third parties may be slow to recruit patients and complete the studies. Furthermore, these third parties may also have relationships with other entities, some of which may be our competitors. If these third parties do not successfully carry out their contractual duties, do not meet expected deadlines, experience work stoppages, terminate their agreements with us or need to be replaced, or do not conduct our clinical trials in accordance with regulatory requirements or our stated protocols, we may need to enter into new arrangements with alternative third parties, which could be difficult, costly or impossible, and our clinical trials may be extended, delayed, or terminated or may need to be repeated. If any of the foregoing occur, we may not be able to obtain, or may be delayed in obtaining, marketing authorizations for our product candidates and may not be able to, or may be delayed in our efforts to, successfully commercialize our product candidates.

Even if our newly developed product candidates receive marketing authorizations, to the extent required, they may fail to achieve market acceptance.

If we can develop enhanced, improved, or new product candidates that receive marketing authorizations, they may nonetheless fail to gain sufficient market acceptance by healthcare providers, patients, third-party payors, and others in the medical community to be commercially successful. The degree of market acceptance of any of our new product candidates following receipt of marketing authorizations, if any, will depend on a number of factors, including:

- our ability to anticipate and meet customer and patient needs;
- the timing of regulatory approvals or clearances, to the extent such are required for marketing;
- the efficacy, safety and other potential advantages, such as convenience and ease of administration, of our product candidates as compared to alternative tests or treatments;
- the clinical indications for which our product candidates are approved or cleared;
- concordance with clinical guidelines established by relevant professional colleges;
- compliance with state guidelines and licensure, if applicable;
- our ability to offer our product candidates for sale at competitive prices;
- the willingness of the target patient population to try our new products, and of physicians to prescribe these products;
- the strength of our marketing and distribution support;
- the availability and requirements of third-party payor insurance coverage and adequate reimbursement for our product candidates;
- the prevalence and severity of side effects and the overall safety profiles of our product candidates;
- any restrictions on the use of our product candidates together with other products and medications;
- our ability to manufacture quality products in an economic and timely manner;
- interactions of our product candidates with other medications patients are taking; and
- the ability of patients to take and tolerate our product candidates.

If our newly developed product candidates are unable to achieve market acceptance, our business, operating results, and financial condition will be harmed.

Additional time may be required to obtain marketing authorizations for certain of our therapeutics product candidates because they are combination products.

Some of our therapeutics product candidates are drug-device combination products that require coordination within the FDA and similar foreign regulatory agencies for review of their device and drug components. Although the FDA and similar foreign regulatory agencies have systems in place for the review and approval of combination products such as ours, we may experience delays in the development and commercialization of our product candidates due to regulatory timing constraints and uncertainties in the product development and approval process.

Our therapeutics product candidates under development include complex medical devices that, if authorized for marketing, will require training for qualified personnel and care for data analysis.

Our therapeutics product candidates under the early stages of development include complex medical devices that, if authorized for marketing, will require training for qualified personnel, including physicians, and care for data analysis. Although we will be required to ensure that our therapeutics product candidates are prescribed only by trained professionals, the potential for misuse of our therapeutics product candidates, if authorized for marketing, still exists due to their complexity. Such misuse could result in adverse medical consequences for patients that could damage our reputation, subject us to costly product liability litigation, and otherwise have a material and adverse effect on our business, operating results, and financial condition.

The successful discovery, development, manufacturing, and sale of biologics is a long, expensive, and uncertain process and carries unique risks and uncertainties. Moreover, even if successful, our biologic products may be subject to competition from biosimilars.

We may develop product candidates regulated as biologics in the future in connection with our therapeutics pipeline. The successful development, manufacturing, and sale of biologics is a long, expensive, and uncertain process. There are unique risks and uncertainties with biologics. For example, access to and supply of necessary biological materials, such as cell lines, may be limited and governmental regulations restrict access to and regulate the transport and use of such materials. In addition, the testing, development, approval, manufacturing, distribution, and sale of biologics is subject to applicable provisions of the FD&C Act, PHSA, and regulations issued thereunder that are often more complex and extensive than the regulations applicable to other pharmaceutical products or to medical devices. Manufacturing biologics, especially in large quantities, is often complicated and may require the use of innovative technologies. Such manufacturing also requires facilities specifically designed and validated for this purpose and sophisticated quality assurance and quality control procedures. Biologics are also frequently costly to manufacture because production inputs are derived from living animal or plant material, and some biologics cannot be made synthetically.

Failure to successfully discover, develop, manufacture, and sell biologics could adversely impact our business, operating results, and financial condition.

Even if we are able to successfully develop biologics in the future, the BPCIA, created a framework for the approval of biosimilars in the United States that could allow competitors to reference data from any future biologic products for which we receive marketing approvals and otherwise increase the risk that any product candidates for which we intend to seek approval as biologic products may face competition sooner than anticipated. Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the original biologic was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA, for the competing product containing the sponsor's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity, and potency of their product. The BPCIA is complex and is still being interpreted and implemented by the FDA. As a result, the law's ultimate impact, implementation, and meaning are subject to uncertainty. While it is uncertain when such processes intended to implement the BPCIA may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for our biological product candidates.

In addition, there is a risk that any of our product candidates regulated as a biologic and licensed under a BLA would not qualify for the 12-year period of exclusivity or that this exclusivity could be shortened due to congressional action or otherwise, potentially creating the opportunity for generic competition sooner than anticipated. Other aspects of the BPCIA, some of which may impact the BPCIA exclusivity provisions, have been the subject of litigation. Moreover, the extent to which a biosimilar, once approved, will be substituted for any one of our reference products in a way that is similar to traditional generic substitution for non-biological products is not yet clear, and will depend on a number of marketplace and regulatory factors that are still developing.

In Europe, the European Commission has granted marketing authorizations for several biosimilars pursuant to a set of general and product class-specific guidelines for biosimilar approvals issued over the past few years. In addition, companies are developing biosimilars in other countries that could compete with any biologic products that we develop. If competitors are able to obtain marketing approval for biosimilars referencing any biologic products that we develop, our product candidates may become subject to competition from such biosimilars, with the attendant competitive pressure and consequences. Expiration or successful challenge of our applicable patent rights could also trigger competition from other products, assuming any relevant exclusivity period has expired. As a result, we could face more litigation and administrative proceedings with respect to the validity and/or scope of patents relating to our biologic products.

If our future pharmaceutical product candidates are not approved by regulatory authorities, including the FDA, we will be unable to commercialize them.

In the future, we may develop pharmaceutical product candidates using our therapeutics pipeline that require FDA approval of an NDA or a BLA before marketing or sale in the United States. In the NDA or BLA process, we, or our collaborative partners, must provide the FDA and similar foreign regulatory authorities with data from preclinical and clinical studies that demonstrate that our product candidates are safe and effective, or in the case of biologics, safe, pure, and potent, for a defined indication before they can be approved for commercial distribution. The FDA or foreign regulatory authorities may disagree with our clinical trial designs and our interpretation of data from preclinical studies and clinical trials. The processes by which regulatory approvals are obtained from the FDA and foreign regulatory authorities to market and sell a new product are complex, require a number of years, depend upon the type, complexity, and novelty of the product candidate, and involve the expenditure of substantial resources for research, development, and testing. The FDA and foreign regulatory authorities have substantial discretion in the drug approval process and may require us to conduct additional nonclinical and clinical testing or to perform post-marketing studies. Further, the implementation

of new laws and regulations, and revisions to FDA clinical trial design guidance, may lead to increased uncertainty regarding the approvability of new drugs.

Applications for our drug or biologic product candidates could fail to receive regulatory approval for many reasons, including, but not limited to, the following:

- the FDA or comparable foreign regulatory authorities may disagree with the design, implementation or results of our or our collaborators' clinical trials;
- the FDA or comparable foreign regulatory authorities may determine that our product candidates are not safe and effective, only moderately effective or have undesirable or unintended side effects, toxicities or other characteristics;
- the population studied in the clinical program may not be sufficiently broad or representative to assure efficacy and safety in the full population for which we seek approval;
- we or our collaborators may be unable to demonstrate to the FDA, or comparable foreign regulatory authorities that a product candidate's clinical and other benefits outweigh its safety risks;
- the FDA or comparable foreign regulatory authorities may disagree with our or our collaborators' interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of our product candidates may not be sufficient to support the submission of a BLA, NDA, or other submission or to obtain regulatory approval in the United States or elsewhere;
- the FDA or comparable foreign regulatory authorities may fail to approve the manufacturing processes, test procedures and specifications, or facilities of third-party manufacturers with which we contract for clinical and commercial supplies; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our or our collaborators' clinical data insufficient for approval.

This lengthy approval process, as well as the unpredictability of the results of clinical trials, may result in our failing to obtain regulatory approval to market any of our product candidates, which would seriously harm our business. In addition, the FDA may recommend advisory committee meetings for certain new molecular entities, and if warranted, require a REMS to assure that a drug's benefits outweigh its risks. Even if we receive regulatory approval of a product, the approval may limit the indicated uses for which the drug may be marketed or impose significant restrictions or limitations on the use and/or distribution of such product.

In addition, in order to market any pharmaceutical or biological product candidates that we develop in foreign jurisdictions, we, or our collaborative partners, must obtain separate regulatory approvals in each country. The approval procedure varies among countries and can involve additional testing, and the time required to obtain approval may differ from that required to obtain FDA approval. Approval by the FDA does not ensure approval by regulatory authorities in other countries, and approval by one foreign regulatory authority does not ensure approval by regulatory authorities in other foreign countries or by the FDA. Conversely, failure to obtain approval in one or more jurisdictions may make approval in other jurisdictions more difficult. These laws, regulations, additional requirements and changes in interpretation could cause non-approval or further delays in the FDA's or other regulatory authorities' review and approval of our and our collaborative partner's product candidates, which would materially harm our business and financial condition and could cause the price of our securities to fall.

The marketing authorization process is expensive, time-consuming, and uncertain, and we may not be able to obtain or maintain authorizations for the commercialization of some or all of our product candidates.

The product candidates associated with our therapeutics pipeline and the activities associated with their development and commercialization, including their design, testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale, and distribution, export, and import, are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and by the European Medicines Agency and comparable regulatory authorities in other countries. We have not received authorization to market any of our product candidates from regulatory authorities in any jurisdiction. Failure to obtain marketing authorization for a product candidate will prevent us from commercializing the product candidate.

Securing marketing authorizations may require the submission of extensive preclinical and clinical data and other supporting information to the various regulatory authorities for each therapeutic indication to establish the product candidate's safety and efficacy, or in the case of product candidates regulated as biologics, such product candidate's safety, purity, and potency. Securing regulatory authorization generally requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the relevant regulatory authority. Our product candidates may not be effective, may be only moderately

effective, or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may preclude our obtaining marketing authorization or prevent or limit commercial use.

The process of obtaining marketing authorizations, both in the United States and abroad, is expensive, may take many years if additional clinical trials are required, if authorization is obtained at all, and can vary substantially based upon a variety of factors, including the type, complexity, and novelty of the product candidates involved. Changes in marketing authorization policies during the development period, changes in or the enactment of additional statutes or regulations, or changes in regulatory review for each submitted product application, may cause delays in the approval or rejection of an application. The FDA and comparable authorities in other countries have substantial discretion in the approval process and may refuse to accept any application we submit, or may decide that our data is insufficient for approval and require additional preclinical, clinical, or other studies. In addition, varying interpretations of the data obtained from preclinical and clinical testing could delay, limit, or prevent marketing authorization of a product candidate. Any marketing authorization we or our collaborators ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the approved product not commercially viable.

Accordingly, if we or our collaborators experience delays in obtaining authorization or if we or they fail to obtain authorization of our product candidates, the commercial prospects for our product candidates may be harmed and our ability to generate revenue will be materially impaired.

Disruptions at the FDA, the SEC and other government agencies caused by funding shortages or global health concerns could hinder their ability to hire and retain key leadership and other personnel, prevent new products and services from being developed or commercialized in a timely manner or otherwise prevent those agencies from performing normal business functions on which the operation of our business may rely, which could negatively impact our business.

The ability of the FDA to review regulatory filings and our ability to commence human clinical trials can be affected by a variety of factors, including government budget and funding levels, ability to hire and retain key personnel and accept the payment of user fees, and statutory, regulatory and policy changes. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of the SEC, and other government agencies on which our operations may rely, including those that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable.

Disruptions at the FDA and other agencies may also slow the time necessary for the review and approval of INDs, which would adversely affect our business. For example, in recent years, the U.S. government shut down several times and certain regulatory agencies, such as the FDA and the SEC, had to furlough critical employees and stop critical activities. If a prolonged government shutdown occurs, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business. Further, future government shutdowns could impact our ability to access the public markets and obtain necessary capital in order to properly capitalize and continue our operations.

If a prolonged government shutdown occurs, or if global health concerns prevent the FDA or other regulatory authorities from conducting their regular inspections, reviews, or other regulatory activities, it could significantly impact the ability of the FDA or other regulatory authorities to timely review and process our regulatory submissions, which could have a material adverse effect on our business.

Our product candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory authorization, limit the commercial profile of an approved label or result in significant negative consequences following marketing approval, if granted.

The use of our product candidates could be associated with side effects or adverse events, which can vary in severity (from minor reactions to death) and frequency (infrequent or prevalent). Side effects or adverse events associated with the use of our product candidates may be observed at any time, including in clinical trials or when a product is commercialized. Undesirable side effects caused by our product candidates could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in a more restrictive label or the delay or denial of regulatory authorization by the FDA or other comparable foreign authorities. Results of our trials could reveal a high and unacceptable severity and prevalence of side effects such as toxicity or other safety issues and could require us or our collaboration partners to perform additional studies or halt development or sale of these product candidates or expose us to product liability lawsuits, which would harm our business and financial results. In such an event, we may be required by regulatory agencies to conduct additional animal or human studies regarding the safety and efficacy of our product candidates, which we have not planned or anticipated or our studies could be suspended or terminated, and the FDA or comparable foreign regulatory authorities could order us to cease further development of or deny or withdraw approval of our product candidates for any or all targeted indications. There can be no assurance that we will resolve any issues related to any product-related adverse events to the satisfaction of the FDA or any other regulatory agency in a timely manner, if ever, which could harm our business, operating results, financial condition and prospects.

Additionally, product quality characteristics have been shown to be sensitive to changes in process conditions, manufacturing techniques, equipment or sites and other such related considerations, hence any manufacturing process changes we implement prior to or after regulatory authorization could impact product safety and efficacy.

Product-related side effects could affect patient recruitment for clinical trials, the ability of enrolled patients to complete our studies or result in potential product liability claims. We currently carry product liability insurance and we are required to maintain product liability insurance pursuant to certain of our agreements. We believe our product liability insurance coverage is sufficient in light of our current clinical programs; however, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability, or such insurance coverage may not be sufficient to cover all losses. A successful product liability claim or series of claims brought against us could adversely affect our business, operating results, and financial condition. In addition, regardless of merit or eventual outcome, product liability claims may result in impairment of our business reputation, withdrawal of clinical study participants, costs due to related litigation, distraction of management's attention from our primary business, initiation of investigations by regulators, substantial monetary awards to patients or other claimants, the inability to commercialize our product candidates and decreased demand for our product candidates, if authorized for commercial sale. Additionally, if one or more of our product candidates receives marketing authorization, and we or others later identify undesirable side effects caused by such products, a number of potentially significant negative consequences could result, including, but not limited to:

- regulatory authorities may suspend, limit or withdraw marketing authorizations for such products, or seek an injunction against their manufacture or distribution;
- regulatory authorities may require additional warnings on the label including "boxed" warnings, or issue safety alerts, Dear Healthcare Provider letters, press releases or other communications containing warnings or other safety information about the product;
- we may be required to change the way the product is administered or conduct additional clinical trials or post-approval studies;
- we may be required to create a REMS plan, which could include a medication guide outlining the risks of such side effects for distribution to patients, a communication plan for healthcare providers and/or other elements to assure safe use;
- the product may become less competitive;
- we may be subject to fines, injunctions or the imposition of criminal penalties;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of a particular product candidate, if approved, and could significantly harm our business, operating results, financial condition, and prospects.

If we receive marketing authorization, regulatory agencies including the FDA and foreign authorities enforce requirements that we report certain information about adverse medical events. For example, under FDA medical device reporting regulations, medical device manufacturers are required to report to the FDA information that a device has or may have caused or contributed to a death or serious injury or has malfunctioned in a way that would likely cause or contribute to a death or serious injury if the malfunction of our device (or any similar future product) were to recur. We may fail to appreciate that we have become aware of a reportable adverse event, especially if it is not reported to us as an adverse event or if it is an adverse event that is unexpected or removed in time from the use of our products. If we fail to investigate and report these events to the FDA within the required timeframes, or at all, the FDA could take enforcement action against us. Any such adverse event involving our products also could result in future corrective actions, such as recalls or customer notifications, or agency action, such as inspection or enforcement action. Any corrective action, whether voluntary or involuntary, including any legal action taken against us, will require us to devote significant time and capital to the matter, distract management from operating our business, and may harm our reputation and financial results.

We may not comply with laws regulating the protection of the environment and health and human safety.

Our research and development involves, or may in the future involve, the use of hazardous materials and chemicals and certain radioactive materials and related equipment. If an accident occurs, we could be held liable for resulting damages, which could be substantial. We are also subject to numerous environmental, health and workplace safety laws and regulations, including those governing laboratory procedures, exposure to blood-borne pathogens and the handling of biohazardous materials. Insurance may not provide adequate coverage against potential liabilities, and we do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us. Additional federal, state, and local laws and regulations affecting our operations may be

adopted in the future. We may incur substantial costs to comply with, and substantial fines or penalties if we violate, any of these laws or regulations.

Unfavorable global economic conditions, whether brought about by global crises, health epidemics, military conflicts and war, geopolitical and trade disputes or other factors, may have a material adverse effect on our business and financial results.

Our business is sensitive to global economic conditions, which can be adversely affected by public health crises (including the COVID-19 pandemic) and epidemics, political and military conflicts, trade and other international disputes, significant natural disasters (including as a result of climate change) or other events that disrupt macroeconomic conditions. Adverse macroeconomic conditions, including inflation, slower growth or recession, new or increased tariffs and other barriers to trade, changes to fiscal and monetary policy or government budget dynamics (particularly in the pharmaceutical and biotech areas), tighter credit, higher interest rates, volatility in financial markets, high unemployment, labor availability constraints, currency fluctuations and other challenges in the global economy have in the past adversely affected, and may in the future adversely affect, us and our business partners and suppliers.

For example, military conflicts or wars (such as the ongoing conflicts between Russia and Ukraine and among Israel and surrounding areas) can cause exacerbated volatility and disruptions to various aspects of the global economy. The uncertain nature, magnitude, and duration of hostilities stemming from such conflicts, including the potential effects of sanctions and counter-sanctions, or retaliatory cyber-attacks on the world economy and markets, have contributed to increased market volatility and uncertainty, which could have an adverse impact on macroeconomic factors that affect our business and operations, such as worldwide supply chain issues. It is not possible to predict the short and long-term implications of military conflicts or wars or geopolitical tensions which could include further sanctions, uncertainty about economic and political stability, increases in inflation rate and energy prices, cyber-attacks, supply chain challenges and adverse effects on currency exchange rates and financial markets.

Additionally, our operations and facilities, as well as operations of our service providers and manufacturers, may be located in areas that are prone to earthquakes and other natural disasters. Such operations and facilities are also subject to the risk of interruption by fire, drought, power shortages, nuclear power plant accidents and other industrial accidents, terrorist attacks and other hostile acts, ransomware and other cybersecurity attacks, telecommunication failure, labor disputes, public health crises (including the COVID-19 pandemic) and other events beyond our control. Global climate change is resulting in certain types of natural disasters occurring more frequently or with more intense effects. If a natural disaster or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure, such as the manufacturing facilities of our third-party contract manufacturers, or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time. Because we rely on a single or limited sources for the supply and manufacture of many critical components, a business interruption affecting such sources would exacerbate any negative consequences on our business. We may not carry sufficient business interruption insurance to compensate us for all losses that may occur.

Any public health crises, including the COVID-19 pandemic, may affect our operations and those of third parties on which we rely, including our business partners and suppliers. To date, we are aware of certain suppliers for our R&D activities who have experienced operational delays directly related to the COVID-19 pandemic. In the past three years, the COVID-19 pandemic has caused, and likely will continue to cause, significant volatility and uncertainty in U.S. and international markets, disruptions to our business and delays in our preclinical studies, clinical trials and timelines, including as a result of impacts associated with protective health measures that we, other businesses and governments are taking or might have to take again in the future to manage the pandemic. The extent to which the COVID-19 pandemic and measures taken in response thereto impact our business, results of operations and financial condition will depend on future developments which are highly uncertain and difficult to predict.

Our operating results may fluctuate significantly, which could adversely impact the value of our common stock.

Our operating results, including our revenues, gross margin, profitability, and cash flows, have varied in the past and may vary significantly in the future, and period-to-period comparisons of our operating results may not be meaningful. Accordingly, our results should not be relied upon as an indication of future performance. Our operating results, including quarterly financial results, may fluctuate as a result of a variety of factors, many of which are outside of our control. Fluctuations in our results may adversely impact the value of our common stock. Factors that may cause fluctuations in our financial results include, without limitation, those listed elsewhere in this “Risk Factors” section. In addition, as we increase our research and development efforts, we expect to incur costs in advance of achieving the anticipated benefits of such efforts.

We may engage in acquisitions that could disrupt our business, cause dilution to our stockholders, or reduce our financial resources.

We have in the past entered into, and may in the future enter into, transactions to acquire other businesses, products, or technologies. Successful acquisitions require us to correctly identify appropriate acquisition candidates and to integrate acquired products or operations and personnel with our own.

Should we make an error in judgment when identifying an acquisition candidate, should the acquired operations not perform as anticipated, or should we fail to successfully integrate acquired technologies, operations, or personnel, we will likely fail to realize the benefits we intended to derive from the acquisition and may suffer other adverse consequences. Acquisitions involve a number of other risks, including:

- we may not be able to make such acquisitions on favorable terms or at all;
- the acquisitions may not strengthen our competitive position, and these transactions may be viewed negatively by customers or investors;
- we may decide to incur debt with debt repayment obligations that we are unable to satisfy or that could otherwise require the use of a significant portion of our cash flow;
- we may decide to issue our common stock or other equity securities to the stockholders of the acquired company, which would reduce the percentage ownership of our existing stockholders;
- we may incur losses resulting from undiscovered liabilities of the acquired business that are not covered by any indemnification we may obtain from the seller;
- the acquisitions may reduce our cash available for operations and other uses;
- the acquisitions may divert of the attention of our management from operating our existing business; and
- the acquisitions may result in charges to earnings in the event of any write-down or write-off of goodwill and other assets recorded in connection with acquisitions.

We cannot predict the number, timing or size of future acquisitions or the effect that any such transactions might have on our business, operating results, and financial condition.

The development and expansion of our business through joint ventures, licensing and other strategic transactions may result in similar risks that reduce the benefits we anticipate from these strategic alliances and cause us to suffer other adverse consequences.

We may be significantly impacted by changes in tax laws and regulations or their interpretation.

U.S. and foreign governments continue to review, reform and modify tax laws. Changes in tax laws and regulations could result in material changes to the domestic and foreign taxes that we are required to provide for and pay. In addition, we are subject to regular audits with respect to our various tax returns and processes in the jurisdictions in which we operate. Errors or omissions in tax returns, process failures, or differences in interpretation of tax laws by tax authorities and us may lead to litigation, payments of additional taxes, penalties, and interest. On December 22, 2017, the Tax Cuts and Jobs Act of 2017 ("TCJA"), was passed into law. The TCJA has given rise to significant one-time and ongoing changes, including, but not limited to, a federal corporate tax rate decrease to 21% for tax years beginning after December 31, 2017, limitations on interest expense deductions, the immediate expensing of certain capital expenditures, the adoption of elements of a partially territorial tax system, new anti-base erosion provisions, a reduction to the maximum deduction allowed for net operating losses generated in tax years after December 31, 2017 and providing for indefinite carryforwards for losses generated in tax years after December 31, 2017. The legislation is unclear in many respects and could be subject to potential amendments and technical corrections, and will be subject to interpretations and implementing regulations by the Treasury and Internal Revenue Service, any of which could mitigate or increase certain adverse effects of the legislation. In addition, it is unclear how these U.S. federal income tax changes will affect state and local taxation. Generally, future changes in applicable tax laws and regulations, or their interpretation and application, could have a material and adverse effect on our business, operating results, and financial condition.

Our ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited.

As of December 31, 2023, we had net operating loss ("NOL") carryforwards of approximately $500.3 million for federal income tax purposes, and $218.6 million for state income tax purposes. The federal NOLs will be carried forward indefinitely and the state NOLs begin expiring in 2028. Utilization of these NOLs depends on many factors, including our future income, which cannot be assured. Some of these NOLs could expire unused and be unavailable to offset our future income tax liabilities. In addition, under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended (the "Code"), and corresponding provisions of state law, if a

corporation undergoes an “ownership change,” which is generally defined as a greater than 50 percentage point change, by value, in its equity ownership by 5% stockholders over a rolling three-year period, the corporation’s ability to use its pre-change NOLs and other pre-change tax attributes to offset its post-change income may be limited. If we determine that an ownership change has occurred and our ability to use our historical NOLs is materially limited, it could harm our future operating results by effectively increasing our future tax obligations. In addition, under the TCJA, federal NOLs incurred in 2018 and in future years may be carried forward indefinitely but generally may not be carried back and the deductibility of such NOLs is limited to 80% of taxable income.

Reimbursement Risks Related to Our Historical Testing Business

Billing disputes with third-party payors may decrease realized revenue and may lead to requests for recoupment of past amounts paid.

Prior to the shutdown of our Laboratory Operations, which occurred in 2021, we operated clinical laboratories and billed for tests. Payors dispute our billing or coding from time to time and we deal with requests for recoupment from third-party payors from time to time in the ordinary course of our business (see Note 9 to our consolidated financial statements included elsewhere in this Annual Report for additional information regarding current recoupment requests). We continue to receive recoupment requests and we expect these disputes and requests for recoupment may continue for a period of time in the future. Third-party payors may decide to deny payment or recoup payment for testing that they contend to have been not medically necessary, against their coverage determinations, or for which they have otherwise overpaid, and we may be required to refund reimbursements already received. We have entered into settlement agreements with government and commercial payors in order to settle claims related to past billing practices that have since been discontinued. For more information on these disputes, see Part I, Item 1. “Business—Reimbursement—Commercial Third-Party Payors.” Additionally, the ACA, enacted in March 2010, requires providers and suppliers to report and return any overpayments received from government payors under the Medicare and Medicaid programs within 60 days of identification. Failure to identify and return such overpayments exposes the provider or supplier to liability under federal false claims laws and the healthcare enforcement authorities of Office of Inspector General of the Department of Health and Human Services ("OIG"). Claims for recoupment also require the time and attention of our management and other key personnel, which can be a distraction from operating our business.

If a third-party payor successfully challenges that payment to us for prior testing was in breach of contract or otherwise contrary to policy or law, they may recoup payment, which amounts could be significant and would impact our operating results and financial condition. We may also decide to negotiate and settle with a third-party payor in order to resolve an allegation of overpayment. In the past, we have negotiated and settled these types of claims with third-party payors. We may be required to resolve further disputes in the future. For example, after the closure of our Laboratory Operations, we received several managed Medicaid payor recoupment requests aggregating to $1.1 million, which we dispute. We can provide no assurance that we will not receive similar claims for recoupment from other third-party payors in the future. For more information on this claim, see Part I, Item 1. “Business—Reimbursement—Payor Dispute.” Any of these outcomes, including recoupment or reimbursements, might also require us to restate our financials from a prior period, any of which could have a material and adverse effect on our business, operating results, and financial condition.

If the validity of an informed consent from a patient is challenged, we could be forced to refund amounts previously paid by third-party payors, or to exclude a patient’s data from clinical trial results.

We are required to ensure that all clinical data and/or patient specimens that we receive have been collected from subjects who have provided appropriate informed consent for us to perform testing in clinical trials. We seek to ensure that the subjects from whom the data and samples are collected do not retain or have conferred on them any proprietary or commercial rights to the data or any discoveries derived from them. A subject’s informed consent could be challenged in the future, and the informed consent could prove invalid, unlawful, or otherwise inadequate for our purposes. Any such findings against us, or our partners, could deny us access to, or force us to stop, testing samples in a particular area or could call into question the results of our clinical trials. In addition, we could be requested to refund amounts previously paid by third-party payors for tests where an informed consent is challenged. We could become involved in legal challenges, which could require significant management and financial resources and adversely affect our operating results.

We may be unable to obtain or maintain third-party payor coverage and reimbursement for our future products.

Our future success will depend on our or our potential partners' ability to obtain or maintain adequate reimbursement coverage from third-party payors. Third-party reimbursement for our testing historically represented a significant portion of our revenues, and we expect third-party payors such as third-party commercial payors and government healthcare programs to be a source of revenue in the future. It is to be determined whether and to what extent certain of our products under development will be covered or reimbursed. If we or our potential partners are unable to obtain or maintain coverage or adequate reimbursement from, or achieve in-network status with, third-party payors for our future products, our ability to generate revenues will be limited. For example, healthcare providers

may be reluctant to prescribe our products due to the potential of a substantial cost to the patient if coverage or reimbursement is unavailable or insufficient.

Regulatory and Legal Risks Related to Our Business

If we or our commercial partners act in a manner that violates healthcare laws or otherwise engage in misconduct, we could face substantial penalties and damage to our reputation, and our business operations and financial condition could be adversely affected.

We are subject to healthcare fraud and abuse regulation and enforcement by both the U.S. federal government and the states in which we conduct our business, including:

- federal and state laws and regulations governing the submission of claims, as well as billing and collection practices, for healthcare services;
- the federal Anti-Kickback Statute, which prohibits, among other things, the knowing and willful solicitation, receipt, offer or payment of remuneration, directly or indirectly, in exchange for or to induce either the referral of an individual for, or the purchase, order or recommendation of, any good or service for which payment may be made under federal healthcare programs such as Medicare and Medicaid; a person does not need to have knowledge of the statute or specific intent to violate it to have committed a violation; a violation of the Anti-Kickback Statute may result in imprisonment for up to ten years and significant fines for each violation and administrative civil money penalties, plus up to three times the amount of the remuneration paid; in addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act;
- the Eliminating Kickbacks in Recovery Act of 2018 ("EKRA"), which, among other things, prohibits knowingly or willfully paying, offering to pay, soliciting or receiving any remuneration (including any kickback, bribe, or rebate), whether directly or indirectly, overtly or covertly, in cash or in kind, to induce a referral of an individual to a recovery home, clinical treatment facility, or laboratory, or in exchange for an individual using the services of that recovery home, clinical treatment facility, or laboratory; violation of EKRA may result in significant fines and imprisonment of up to 10 years for each occurrence;
- the federal False Claims Act which prohibits, among other things, the presentation of false or fraudulent claims for payment from Medicare, Medicaid, or other government-funded third-party payors discussed in more detail below;
- federal laws and regulations governing the Medicare program, providers of services covered by the Medicare program, and the submission of claims to the Medicare program, as well as the Medicare Manuals issued by CMS and the local medical policies promulgated by the Medicare Administrative Contractors with respect to the implementation and interpretation of such laws and regulations;
- the federal Stark Law, also known as the physician self-referral law, which, subject to certain exceptions, prohibits a physician from making a referral for certain designated health services covered by the Medicare program (and according to case law in some jurisdictions, the Medicaid program as well), including laboratory and pathology services, if the physician or an immediate family member has a financial relationship with the entity providing the designated health services; a person who attempts to circumvent the Stark Law may be fined up to approximately $165,000 for each arrangement or scheme that violates the statute; in addition, any person who presents or causes to be presented a claim to the Medicare or Medicaid programs in violation of the Stark Law is subject to significant civil monetary penalties, plus up to three times the amount of reimbursement claimed;
- the federal Civil Monetary Penalties Law, which, subject to certain exceptions, prohibits, among other things, the offer or transfer of remuneration, including waivers of copayments and deductible amounts (or any part thereof), to a Medicare or state healthcare program beneficiary if the person knows or should know it is likely to influence the beneficiary's selection of a particular provider, practitioner or supplier of services reimbursable by Medicare or a state healthcare program; any violation of these prohibitions may result in significant civil monetary penalties for each wrongful act;
- the prohibition on reassignment by the program beneficiary of Medicare claims to any party;
- The federal Healthcare Fraud Statute, which, among other things, imposes criminal liability for executing or attempting to execute a scheme to defraud any healthcare benefit program, willfully embezzling or stealing from a healthcare benefit program, willfully obstructing a criminal investigation of a healthcare offense, and knowingly and willfully falsifying, concealing or covering up a material fact or making false, fictitious or fraudulent statements relating to healthcare matters;

similar to the federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;

- HIPAA, as amended by HITECH, and their implementing regulations, which imposes privacy, security and breach reporting obligations with respect to PHI upon entities subject to the law, such as health plans, healthcare clearinghouses and certain healthcare providers, known as covered entities, and their respective business associates, individuals or entities that perform services for them that involve PHI; HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in U.S. federal courts to enforce HIPAA and seek attorneys' fees and costs associated with pursuing federal civil actions;
- the federal transparency requirements under the Physician Payments Sunshine Act, created under the ACA, which requires, among other things, certain manufacturers of drugs, devices, biologics and medical supplies reimbursed under Medicare, Medicaid, or the Children's Health Insurance Program to annually report to CMS information related to payments and other transfers of value provided to physicians, various other healthcare professionals, including physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists, and certified nurse midwives, and teaching hospitals and physician ownership and investment interests, including such ownership and investment interests held by a physician's immediate family members; we believe that we are currently exempt from these reporting requirements; we cannot assure you, however, that regulators, principally the federal government, will agree with our determination, and a determination that we have violated these laws and regulations, or a public announcement that we are being investigated for possible violations, could adversely affect our business;
- federal and state laws and regulations governing informed consent for genetic testing and the use of genetic material;
- state law equivalents of the above U.S. federal laws, such as the Stark Law, Anti-Kickback Statute and false claims laws, which may apply to items or services reimbursed by any third-party payor, including commercial insurers; and
- similar healthcare laws in the European Union and other jurisdictions, including reporting requirements detailing interactions with and payments to healthcare providers.

Furthermore, a development affecting our industry is the increased enforcement of the federal False Claims Act and, in particular, actions brought pursuant to the False Claims Act's "whistleblower" or "*qui tam*" provisions. The False Claims Act imposes liability for, among other things, knowingly presenting, or causing to be presented, a false or fraudulent claim for payment by a federal governmental payor program. The *qui tam* provisions of the False Claims Act allow a private individual to bring civil actions on behalf of the federal government for violations of the False Claims Act and permit such individuals to share in any amounts paid by the defendant to the government in fines or settlement.

When an entity is determined to have violated the False Claims Act, it is subject to mandatory damages of three times the actual damages sustained by the government, plus significant mandatory civil penalties for each false claim. In addition, various states have enacted false claim laws analogous to the federal False Claims Act, and in some cases apply more broadly because many of these state laws apply to claims made to private payors and not merely governmental payors.

The evolving interpretations of these laws and regulations by courts and regulators increase the risk that we may be alleged to be, or in fact found to be, in violation of these or other laws and regulations, including pursuant to private *qui tam* actions brought by individual whistleblowers in the name of the government as described above.

Our inability to obtain, on a timely basis or at all, any necessary marketing authorizations for new device products or improvements could adversely affect our future product commercialization and operating results.

Our product candidates are expected to be subject to regulation by the FDA, and numerous other federal and state governmental authorities. The process of obtaining regulatory approvals or clearances to market a medical device, particularly from the FDA and regulatory authorities outside the United States, can be costly and time-consuming, and approvals or clearances might not be granted for future products on a timely basis, if at all. To ensure ongoing customer safety, regulatory agencies such as the FDA may re-evaluate their current approval or clearance processes and may impose additional requirements. In addition, the FDA and other regulatory authorities may impose increased or enhanced regulatory inspections for domestic or foreign facilities involved in the manufacture of medical devices.

We may develop new medical devices in connection with our therapeutics pipeline that are regulated by the FDA as medical devices. Unless otherwise exempted, medical devices must receive one of the following marketing authorizations from the FDA before being marketed in the United States: "510(k) clearance," *de novo* classification, or PMA. The FDA determines whether a medical device will require 510(k) clearance, *de novo* classification, or the PMA process based on statutory criteria that include the

risk associated with the device and whether the device is similar to an existing, legally marketed product. In the 510(k) clearance process, before a device may be marketed, the FDA must determine that a proposed device is "substantially equivalent" to a legally marketed "predicate" device, which includes a device that has been previously cleared through the 510(k) process, a device that was legally marketed prior to May 28, 1976 (pre-amendments device), a device that was originally on the U.S. market pursuant to an approved PMA and later down-classified, or a 510(k)-exempt device. To be "substantially equivalent," the proposed device must have the same intended use as the predicate device, and either have the same technological characteristics as the predicate device or have different technological characteristics and not raise different questions of safety or effectiveness than the predicate device. Clinical data are sometimes required to support substantial equivalence. In the process of obtaining PMA approval, the FDA must determine that a proposed device is safe and effective for its intended use based, in part, on extensive data, including, but not limited to, technical, preclinical, clinical trial, manufacturing, and labeling data. The PMA process is typically required for devices that are deemed to pose the greatest risk, such as life-sustaining, life-supporting or implantable devices. The process to obtain either 510(k) clearance or PMA will likely be costly, time-consuming, and uncertain. However, we believe the PMA process is generally more challenging. Even if we design a product that we expect to be eligible for the 510(k) clearance process, the FDA may require that the product undergo the PMA process. There can be no assurance that the FDA will approve or clear the marketing of any new medical device product that we develop. Even if regulatory approval or clearance is granted, such approval may include significant limitations on indicated uses, which could materially and adversely affect the prospects of the new medical device product.

If a medical device is novel and has not been previously classified by the FDA as Class I, II, or III, it is automatically classified into Class III regardless of the level of risk it poses. The Food and Drug Administration Modernization Act of 1997 established a route to market for low to moderate risk medical devices that are automatically placed into Class III due to the absence of a predicate device, called the "Request for Evaluation of Automatic Class III Designation," or the *de novo* classification procedure. This procedure allows a manufacturer whose novel device would automatically be classified into Class III to request down-classification of its medical device into Class I or Class II on the basis that the device presents low or moderate risk, rather than requiring the submission and approval of a PMA application.

FDA marketing authorization could not only be required for new products we develop, but also could be required for certain enhancements we may seek to make to our future products. Delays in receipt of, or failure to obtain, marketing authorizations could materially delay or prevent us from commercializing our products or result in substantial additional costs that could decrease our profitability. In addition, even if we receive FDA or other regulatory marketing authorizations for a new or enhanced product, the FDA or such other regulator may condition, withdraw, or materially modify its marketing authorization.

We are subject to costly and complex laws and governmental regulations.

Our therapeutics product candidates are subject to a complex set of regulations and rigorous enforcement, including by the FDA, DOJ, HHS, and numerous other federal, state, and non-U.S. governmental authorities. To varying degrees, each of these agencies requires us to comply with laws and regulations governing the development, testing, manufacturing, labeling, marketing, and distribution of our product candidates, if approved. As a part of the regulatory process of obtaining marketing authorization for new products and modifications to products, we may conduct and participate in numerous clinical trials with a variety of study designs, patient populations, and trial endpoints. Unfavorable or inconsistent clinical data from existing or future clinical trials or the market's or FDA's perception of this clinical data, may adversely impact our ability to obtain product approvals, our position in, and share of, the markets in which we participate, and our business, operating results, and financial condition. We cannot guarantee that we will be able to obtain or maintain marketing authorization for our product candidates and/or enhancements or modifications to products, and the failure to maintain or obtain marketing authorization in the future could have a material and adverse effect on our business, operating results, financial condition.

Both before and after a product is commercially released, we and our products are subject to ongoing and pervasive oversight of government regulators. For instance, in the case of any product candidates subject to regulation by the FDA, including those products candidates in connection with our therapeutics pipeline, our facilities and procedures and those of our suppliers will be subject to periodic inspections by the FDA to determine compliance with applicable regulations. The results of these inspections can include inspectional observations on FDA's Form-483, warning letters, or other forms of enforcement. If the FDA or a non-U.S. regulatory agency were to conclude that we are not in compliance with applicable laws or regulations, or that any of our product candidates, if authorized for marketing, are ineffective or pose an unreasonable health risk, the FDA or such other non-U.S. regulatory agency could ban products, withdraw marketing authorizations for such products, detain or seize adulterated or misbranded products, order a recall, repair, replacement, or refund of such products, refuse to grant pending marketing applications, require certificates of non-U.S. governments for exports, and/or require us to notify health professionals and others that the products present unreasonable risks of substantial harm to the public health. The FDA and other non-U.S. regulatory agencies may also assess civil or criminal penalties against us, our officers, or employees and impose operating restrictions on a company-wide basis. The FDA may also recommend prosecution to the DOJ. Any adverse regulatory action, depending on its magnitude, may restrict us from effectively marketing and selling our products and limit our ability to obtain future marketing authorizations, and could result in a substantial modification to our

business practices and operations. Furthermore, we occasionally receive investigative demands, subpoenas, or other requests for information from state and federal governmental agencies, and we cannot predict the timing, outcome, or impact of any such investigations. See Note 9 to our consolidated financial statements included elsewhere in this Annual Report. Any adverse outcome in one or more of these investigations could include the commencement of civil and/or criminal proceedings, substantial fines, penalties, and/or administrative remedies, including exclusion from government reimbursement programs and/or amendments to our corporate integrity agreement with the OIG. In addition, resolution of any of these matters could involve the imposition of additional, costly compliance obligations. These potential consequences, as well as any adverse outcome from government investigations, could have a material and adverse effect on our business, operating results, and financial condition.

Current and future legislation may increase the difficulty and cost for us, and any collaborators, to obtain marketing approval of and commercialize our drug candidates and affect the prices we, or they, may obtain.

To date, there have been several recent U.S. congressional inquiries and proposed and enacted state and federal legislation and regulation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient support programs, reduce the costs of drugs under Medicare and reform government program reimbursement methodologies for drug products. Heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products has resulted in several recent Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products. We expect that additional state and federal healthcare reform measures will be adopted in the future, particularly in light of the new presidential administration, any of which could limit the amounts that federal and state governments will pay for healthcare therapies, which could result in reduced demand for our product candidates or additional pricing pressures. For example, on August 16, 2022, President Biden signed into law the Inflation Reduction Act of 2022 (“IRA”), which contains provisions intended to lower beneficiary drug spending. Beginning in 2023, the IRA authorizes the CMS to negotiate Medicare reimbursement rates for certain prescription drug products, which may put limits on prices paid for drugs by government health programs. We cannot be sure whether additional legislation or rulemaking related to the IRA will be issued or enacted, or what impact, if any, such changes will have on the profitability of any of our drug candidates, if approved for commercial use, in the future.

We and our commercial partners and contract manufacturers are subject to significant regulation with respect to manufacturing medical devices and therapeutic products. The manufacturing facilities on which we rely may not continue to meet regulatory requirements or may not be able to meet supply demands.

Entities involved in the preparation of medical devices and/or therapeutic products for clinical studies or commercial sale, including our manufacturers for the therapeutic products that we may develop, are subject to extensive regulation. Components of a finished medical device or therapeutic product approved for commercial sale or used in late-stage clinical studies must be manufactured in accordance with cGMP and/or QSR requirements. These regulations govern manufacturing processes and procedures (including record keeping) and the implementation and operation of quality systems to control and assure the quality of investigational products and products approved for sale. Poor control of production processes can lead to the introduction of contaminants or to inadvertent changes in the properties or stability of our product candidates that may not be detectable in final product testing. We, our collaboration partners or our contract manufacturers must supply all necessary documentation in support of an NDA, a BLA, a PMA, a 510(k) application, a request for *de novo* classification, or a Marketing Authorization Application ("MAA"), on a timely basis and must adhere to cGMP regulations enforced by the FDA and other regulatory agencies through their facilities inspection program. Some of our contract manufacturers may have never produced a commercially approved pharmaceutical product and therefore have not been subject to the review of the FDA and other regulators. The facilities and quality systems of some or all of our collaboration partners and third-party contractors must pass a pre-approval inspection for compliance with the applicable regulations as a condition of regulatory approval of our drug and biologic product candidates and may be subject to inspection in connection with a MAA for any of our other potential product candidates. In addition, the regulatory authorities may, at any time, audit or inspect a manufacturing facility involved with the preparation of our product candidates or our other potential products or the associated quality systems for compliance with the regulations applicable to the activities being conducted. Although we oversee our contract manufacturers, we cannot control the manufacturing process of, and are completely dependent on, such contract manufacturing partners for compliance with these regulatory requirements. If these facilities do not pass a pre-approval plant inspection, marketing authorizations for the products may not be granted or may be substantially delayed until any violations are corrected to the satisfaction of the regulatory authority, if ever.

The regulatory authorities also may, at any time following approval or clearance of a product for sale, audit the manufacturing facilities of our collaboration partners and third-party contractors. If any such inspection or audit identifies a failure to comply with applicable regulations or if a violation of our product specifications or applicable regulations occurs independent of such an inspection or audit, we or the relevant regulatory authority may require remedial measures that may be costly and/or time-consuming for us or a third party to implement and that may include the temporary or permanent suspension of a clinical study or commercial sales or the temporary or permanent closure of a facility.

Any such remedial measures imposed upon us or third parties with whom we contract could materially harm our business.

If we, our collaboration partners or any of our third-party manufacturers fail to maintain regulatory compliance, the FDA or other applicable regulatory authority can impose regulatory sanctions including, among other things, refusal to approve a pending application for a new product candidate, withdrawal of a marketing authorization or suspension of production. As a result, our business, operating results, and financial condition may be materially harmed.

Additionally, if supply from one approved manufacturer is interrupted, an alternative manufacturer will need to be qualified and we may need to obtain marketing authorization for a change in the manufacturer through submission of a PMA supplement, 510(k) pre-market notification, NDA or BLA supplement, MAA variation or other regulatory filing to the FDA or other foreign regulatory agencies, which could result in further delay.

These factors could cause us to incur additional costs and could cause the delay or termination of clinical studies, regulatory submissions, required marketing authorizations or commercialization of our products under development. Furthermore, if our suppliers fail to meet contractual requirements and we are unable to secure one or more replacement suppliers capable of production at a substantially equivalent cost, our clinical studies may be delayed or we could lose potential revenue.

If the FDA does not conclude that certain of our product candidates satisfy the requirements for the Section 505(b)(2) regulatory approval pathway, or if the requirements for such product candidates under Section 505(b)(2) are not as we expect, the approval pathway for those product candidates will likely take significantly longer, cost significantly more and entail significantly greater complications and risks than anticipated, and in either case may not be successful.

We are developing proprietary product candidates, such as BT-600, a GI-targeted tofacitinib, for which we may seek FDA approval through the Section 505(b)(2) regulatory pathway. We expect that BT-600 will be regulated as a drug-device combination product under the drug provisions of the FD&C Act, enabling us to submit NDAs for approval of this product candidate. The Hatch-Waxman Act added Section 505(b)(2) to the FD&C Act. Section 505(b)(2) permits the filing of an NDA where at least some of the information required for approval comes from studies that were not conducted by or for the applicant and for which the applicant has not obtained a right of reference. Section 505(b)(2), if applicable to us under the FD&C Act, would allow an NDA we submit to the FDA to rely in part on data in the public domain or the FDA's prior conclusions regarding the safety and effectiveness of approved compounds, which could expedite the development program for our product candidate by potentially decreasing the amount of nonclinical and/or clinical data that we would need to generate in order to obtain FDA approval. If the FDA does not allow us to pursue the Section 505(b)(2) regulatory pathway as anticipated, we may need to conduct additional nonclinical studies and/or clinical trials, provide additional data and information, and meet additional standards for regulatory approval. If this were to occur, the time and financial resources required to obtain FDA approval for this product candidate, and complications and risks associated with this product candidate, would likely substantially increase. Moreover, inability to pursue the Section 505(b)(2) regulatory pathway could result in new competitive products reaching the market more quickly than our product candidate, which would likely materially adversely impact our competitive position and prospects. Even if we are allowed to pursue the Section 505(b)(2) regulatory pathway, we cannot assure you that our product candidate will receive the requisite approval for commercialization.

In addition, notwithstanding the approval of a number of products by the FDA under Section 505(b)(2) over the last few years, certain pharmaceutical companies and others have objected to the FDA's interpretation of Section 505(b)(2). If the FDA's interpretation of Section 505(b)(2) is successfully challenged, the FDA may change its 505(b)(2) policies and practices, which could delay or even prevent the FDA from approving any NDA that we submit under Section 505(b)(2). In addition, the pharmaceutical industry is highly competitive, and Section 505(b)(2) NDAs are subject to certain requirements designed to protect the patent rights of sponsors of previously approved drugs that are referenced in a Section 505(b)(2) NDA. These requirements may give rise to patent litigation and mandatory delays in approval of our NDAs for up to 30 months or longer depending on the outcome of any litigation. It is not uncommon for a manufacturer of an approved product to file a citizen petition with the FDA seeking to delay approval of, or impose additional approval requirements for, pending competing products. If successful, such petitions can significantly delay, or even prevent, the approval of the new product. Even if the FDA ultimately denies such a petition, the FDA may substantially delay approval while it considers and responds to the petition. In addition, even if we are able to utilize the Section 505(b)(2) regulatory pathway, there is no guarantee this would ultimately lead to streamlined product development or earlier approval.

Moreover, even if our product candidate is approved under Section 505(b)(2), the approval may be subject to limitations on the indicated uses for which the product may be marketed or to other conditions of approval, or may contain requirements for costly post-marketing testing and surveillance to monitor the safety or efficacy of the product.

The misuse or off-label use of our product candidates may harm our reputation in the marketplace, result in injuries that lead to product liability suits or result in costly investigations, fines or sanctions by regulatory bodies if we are deemed to have engaged in the promotion of these uses, and any of these consequences could be costly to our business.

We are developing certain therapeutics product candidates, including pharmaceutical products and medical devices, which if authorized for marketing by the FDA or other regulatory authorities, will be authorized for use in specific indications and patient

populations. We expect to train our marketing personnel and direct sales force not to promote our product candidates for uses outside of the FDA-approved or -cleared indications for use, which are sometimes referred to as "off-label uses." We cannot, however, prevent a physician from using our products off-label, when in the physician's independent professional medical judgment he or she deems it appropriate. There may be increased risk of injury to patients if physicians attempt to use our products off-label. Furthermore, the use of our products for indications other than those authorized for marketing by the FDA or any foreign regulatory body may not effectively treat such conditions, which could harm our reputation in the marketplace among physicians and patients.

If the FDA or any foreign regulatory body determines that our promotional materials or training constitute promotion of an off-label use, it could request that we modify our training or promotional materials or subject us to regulatory or enforcement actions, including the issuance or imposition of an untitled letter, a warning letter, injunction, seizure, civil fine, or criminal penalties. It is also possible that other federal, state or foreign enforcement authorities might take action under other regulatory authority, such as false claims laws, if they consider our business activities to constitute promotion of an off-label use, which could result in significant penalties, including, but not limited to, criminal, civil, and administrative penalties, damages, fines, disgorgement, exclusion from participation in government healthcare programs and the curtailment of our operations.

In addition, physicians may misuse our products or use improper techniques if they are not adequately trained, potentially leading to injury and an increased risk of product liability. If our products are misused or used with improper technique, we may become subject to costly litigation by our customers or their patients. As described above, product liability claims could divert management's attention from our core business, be expensive to defend and result in sizeable damage awards against us that may not be covered by insurance.

Our internal information technology systems, or those of any of our third party service providers, or potential future collaborators, may fail or suffer security or data privacy breaches or other unauthorized or improper access to, use of, or destruction of our proprietary or confidential data, employee data or personal data, which could result in additional costs, loss of revenue, significant liabilities, harm to our brand and material disruption of our operations.

In the ordinary course of our business, we and the third parties upon which we rely collect, receive, store, process, generate, use, transfer, disclose, make accessible, protect, secure, dispose of, transmit, and share (collectively, process) proprietary, confidential, and sensitive data, including personal data, intellectual property, trade secrets, and other sensitive data (collectively, sensitive information). We may implement a variety of security measures designed to protect systems that store our information, given their size and complexity and the increasing amounts of information maintained on our internal information technology systems and those of our third-party service providers and supply chain companies, and consultants, these systems are potentially vulnerable to breakdown or other damage or interruption from service interruptions, system malfunction, natural disasters, terrorism, war and telecommunication and electrical failures, as well as security breaches from inadvertent or intentional actions by our employees, contractors, consultants, business partners and/or other third parties, or from cyber-attacks by malicious third parties, which may compromise our system infrastructure or lead to the loss, destruction, alteration or dissemination of, or damage to, our data.

Some actors now engage and are expected to continue to engage in cyber-attacks, including without limitation nation-state actors for geopolitical reasons and in conjunction with military conflicts and defense activities. During times of war and other major conflicts, we, and the third parties upon which we rely, may be vulnerable to a heightened risk of these attacks, including retaliatory cyber-attacks, that could materially disrupt our systems and operations, supply chain, and ability to produce, sell and distribute our goods and services. In particular, severe ransomware attacks are becoming increasingly prevalent and can lead to significant interruptions in our operations, ability to provide our products or services, loss of sensitive data and income, reputational harm, and diversion of funds. Extortion payments may alleviate the negative impact of a ransomware attack, but we may be unwilling or unable to make such payments due to, for example, applicable laws or regulations prohibiting such payments.

To the extent that any disruption or security breach were to result in loss, destruction, unavailability, alteration or dissemination of, or damage to, our data or applications, or for it to be believed or reported that any of these occurred, we could incur liability and reputational damage and the development and commercialization of our programs could be delayed. Further, our insurance policies may not be adequate to compensate us for the potential losses arising from any such disruption in, or failure or security breach of, our systems or third-party systems where information important to our business operations or commercial development is stored.

While we have implemented security measures designed to protect against security incidents, there can be no assurance that these measures will be effective. We may be unable in the future to detect vulnerabilities in our information technology systems because such threats and techniques change frequently, are often sophisticated in nature, and may not be detected until after a security incident has occurred. Further, we may experience delays in developing and deploying remedial measures designed to address any such identified vulnerabilities. Applicable data privacy and security obligations may require us to notify relevant stakeholders of security incidents. Such disclosures are costly, and the disclosure or the failure to comply with such requirements could lead to adverse consequences.

We rely on third-party service providers and technologies to operate critical business systems to process sensitive information in a variety of contexts. Our ability to monitor these third parties' information security practices is limited, and these third parties may not have adequate information security measures in place. If our third-party service providers experience a security incident or other interruption, we could experience adverse consequences. While we may be entitled to damages if our third-party service providers fail to satisfy their privacy or security-related obligations to us, any award may be insufficient to cover our damages, or we may be unable to recover such award. In addition, supply-chain attacks have increased in frequency and severity, and we cannot guarantee that third parties' infrastructure in our supply chain or our third-party partners' supply chains have not been compromised.

If we (or a third party upon whom we rely) experience a security incident or are perceived to have experienced a security incident, we may experience adverse consequences, such as government enforcement actions (for example, investigations, fines, penalties, audits, and inspections); additional reporting requirements and/or oversight; restrictions on processing sensitive information (including personal data); litigation (including class claims); indemnification obligations; negative publicity; reputational harm; monetary fund diversions; interruptions in our operations (including availability of data); financial loss; and other similar harms. Security incidents and attendant consequences may cause stakeholders (including investors and potential customers) to stop supporting our platform, deter new customers from products, and negatively impact our ability to grow and operate our business.

Our contracts may not contain limitations of liability, and even where they do, there can be no assurance that limitations of liability in our contracts are sufficient to protect us from liabilities, damages, or claims related to our data privacy and security obligations. We cannot be sure that our insurance coverage will be adequate or sufficient to protect us from or to mitigate liabilities arising out of our privacy and security practices, that such coverage will continue to be available on commercially reasonable terms or at all, or that such coverage will pay future claims.

Risks Related to Our Intellectual Property

New third-party claims of intellectual property infringement could result in litigation or other proceedings, which would be costly and time-consuming, and could limit our ability to commercialize our products under development.

Our success depends in part on our freedom-to-operate with respect to the patents or intellectual property rights of third parties. We operate in industries in which there have been substantial litigation and other proceedings regarding patents and other intellectual property rights. For example, we have identified a number of third-party patents that may be asserted against us with respect to certain of our future products, and have identified pending patent applications for which the ultimate claim scope and validity are uncertain. We believe that we do not infringe the relevant claims of these third-party patents and/or that the relevant claims of these patents are likely invalid or unenforceable. We may choose to challenge the validity of these patents, though the outcome of any challenge that we may initiate in the future is uncertain. We may also decide in the future to seek a license to those third-party patents, but we might not be able to do so on reasonable terms. Certain third parties, including our competitors or collaborators, may in the future assert that we are employing their proprietary technology without authorization or that we are otherwise infringing their intellectual property rights. The risk of intellectual property proceedings may increase as the number of products and the level of competition in our industry segments grows. Defending against infringement claims is costly and may divert the attention of our management and technical personnel. If we are unsuccessful in defending against patent infringement claims, we could be required to stop developing or commercializing products, pay potentially substantial monetary damages, and/or obtain licenses from third parties, which we may be unable to do on acceptable terms, if at all, and which may require us to make substantial royalty payments. In addition, we could encounter delays in product introductions while we attempt to develop alternative non-infringing products. Any of these or other adverse outcomes could have a material and adverse effect on our business, operating results, and financial condition. See Note 9 to our consolidated financial statements included elsewhere in this Annual Report for more information regarding a patent infringement suit filed by Ravgen, Inc. related to our discontinued historical laboratory developed test business, which is no longer in operation. There can be no assurance that we will prevail in the Ravgen matter. For example, in a patent infringement suit filed by Ravgen against another laboratory asserting the same patents, a Texas jury found the laboratory liable for infringement and awarded significant damages.

As we move into new markets and develop enhancements to and new applications for our product candidates, competitors have asserted and may in the future assert their patents and other proprietary rights against us as a means of blocking or slowing our entry into such markets or our sales of such new or enhanced products or as a means to extract substantial license and royalty payments from us. Our competitors and others may have significantly stronger, larger, and/or more mature patent portfolios than we have, and additionally, our competitors may be better resourced and highly motivated to protect large, well-established markets that could be disrupted by our product candidates. In addition, future litigation may involve patent holding companies or other patent owners or licensees who have no relevant product revenues and against whom our own patents may provide little or no deterrence or protection.

In addition, our agreements with some of our collaborators, suppliers, and other entities with whom we do business require us to defend or indemnify these parties to the extent they become involved in infringement claims, including the types of claims described

above. We could also voluntarily agree to defend or indemnify third parties if we determine it to be in the best interests of our business relationships. If we are required or agree to defend or indemnify third parties in connection with any infringement claims, we could incur significant costs and expenses that could adversely affect our business, operating results, and financial condition.

Because the industries in which we operate are particularly litigious, we are susceptible to intellectual property suits that could cause us to incur substantial costs or pay substantial damages or prohibit us from selling our products under development or conducting our business.

There is a substantial amount of litigation over patent and other intellectual property rights in the industries in which we operate, including, but not limited to, the biotechnology, life sciences, pharmaceuticals, and medical device industries. Whether a product infringes a patent involves complex legal and factual issues that may be open to different interpretations. Searches typically performed to identify potentially infringed patents of third parties are often not conclusive and because patent applications can take many years to issue, there may be applications now pending, which may later result in issued patents which our future products may infringe. In addition, our competitors or other parties may assert that our product candidates and the methods they employ may be covered by patents held by them. If any of our products infringes a valid patent, we could be prevented from manufacturing or selling it unless we can obtain a license or redesign the product to avoid infringement. A license may not always be available or may require us to pay substantial royalties. Infringement and other intellectual property claims, with or without merit, can be expensive and time-consuming to litigate and could divert our management's attention from operating our business.

Any inability to effectively protect our proprietary technologies could harm our competitive position.

Our success and ability to compete depend to a large extent on our ability to develop proprietary products and technologies and to maintain adequate protection of our intellectual property in the United States and elsewhere. The laws of some foreign countries do not protect proprietary rights to the same extent as the laws of the United States, and many companies have encountered significant challenges in establishing and enforcing their proprietary rights outside of the United States. These challenges can be caused by the absence of rules and methods for the establishment and enforcement of intellectual property rights in certain jurisdictions outside of the United States. In addition, the proprietary positions of companies in the industries in which we operate generally are uncertain and involve complex legal and factual questions. This is particularly true in the life sciences area where the U.S. Supreme Court has issued a series of decisions setting forth limits on the patentability of natural phenomena, natural laws, abstract ideas and their applications (see, *Mayo Collaborative v. Prometheus Laboratories (2012), Association for Molecular Pathology v. Myriad Genetics (2013), and Alice Corporation v. CLS Bank (2014),* which has made it difficult to obtain certain patents and to assess the validity of previously issued patents). This uncertainty may materially affect our ability to defend or obtain patents or to address the patents and patent applications owned or controlled by our collaborators and licensors.

We will be able to protect our proprietary rights from unauthorized use by third parties only to the extent that our proprietary technologies are covered by valid and enforceable patents or are effectively maintained as trade secrets. Any finding that our patents or patent applications are invalid or unenforceable could harm our ability to prevent others from practicing the related technology. We cannot be certain that we were the first to invent the inventions covered by pending patent applications or that we were the first to file such applications, and a finding that others have claims of inventorship or ownership rights to our patents and applications could require us to obtain certain rights to practice related technologies, which may not be available on favorable terms, if at all. There may be times when we choose to retain advisors with academic employers who limit their employees' rights to enter into agreements which provide the kind of confidentiality and assignment provisions congruent with our consulting agreements. We may decide that obtaining the services of these advisors is worth any potential risk, and this may harm our ability to obtain and enforce our intellectual property rights. In addition, our existing patents and any future patents we obtain may not be sufficiently broad to prevent others from practicing our technologies or from developing similar or alternative competing products, or design around our patented technologies, and may therefore fail to provide us with any competitive advantage. Furthermore, as our issued patents expire, we may lose some competitive advantage as others develop competing products that would have been covered by the expired patents, and, as a result, may adversely affect our business, operating results, and financial condition.

We may be required to file or defend infringement lawsuits and other contentious proceedings, such as *inter partes* reviews, reexaminations, oppositions, and declaratory judgment actions, to protect our interests, which can be expensive and time-consuming. We cannot assure you that we would prevail over an infringing third party, and we may become subject to counterclaims by such third parties. Our patents may be declared invalid or unenforceable, or narrowed in scope, as a result of such litigation or other proceedings. Some third-party infringers may have substantially greater resources than us and may be able to sustain the costs of complex infringement litigation more effectively than we can. Even if we have valid and enforceable patents, competitors may still choose to offer products that infringe our patents.

Further, preliminary injunctions that bar future infringement by the competitor are not often granted; therefore, remedies for infringement are not often immediately available. Even if we prevail in an infringement action, we cannot assure you that we would be fully or partially financially compensated for any harm to our business. We may be forced to enter into a license or other agreement

with the third parties on terms less profitable or otherwise less commercially acceptable to us than those negotiated between a willing licensee and a willing licensor. Any inability to stop third-party infringement could result in the future in a loss in market share of our products under development, or lead to a delay, reduction, and/or inhibition of our development, manufacture, or sale of some of our products. A product produced and sold by a third-party infringer may not meet our or other regulatory standards or may not be safe for use, which could cause irreparable harm to the reputation of our products, which in turn could result in substantial loss in our market share and profits.

There is also the risk that others, including our competitors in the targeted and systemic therapeutics fields, may independently develop similar or alternative technologies, ingestible devices, or design around our patented or patent pending technologies, and our competitors or others may have filed, and may in the future file, conflicting patent claims covering technology similar or identical to ours. The costs associated with challenging conflicting patent claims could be substantial, and it is possible that our efforts would be unsuccessful and may result in a loss of our patent position and the issuance or validation of the competing claims. Should such competing claims cover our technology, we could be required to obtain rights to those claims at substantial cost.

Any of these factors could adversely affect our ability to obtain commercially relevant or competitively advantageous patent protection for our products under development.

"Submarine" patents may be granted to our competitors, which may significantly alter our launch timing expectations, reduce our projected market size, cause us to modify our product or process or block us from the market altogether.

The term "submarine" patent is used to denote a patent issuing from an application that was not published, publicly known or available prior to its grant. Submarine patents add substantial risk and uncertainty to our business. Submarine patents may issue to our competitors covering our product candidates and thereby cause significant market entry delay, defeat our ability to market our product candidates or cause us to abandon development and/or commercialization of a product candidate.

The issuance of one or more submarine patents may harm our business by causing substantial delays in our ability to introduce a product candidate or other product into the U.S. market.

If we are not able to adequately protect our trade secrets, know-how, and other proprietary information, the value of our technology and products under development could be significantly diminished.

We rely on trade secret protection and proprietary know-how protection for our confidential and proprietary information, and we have taken security measures to protect this information. These measures, however, may not provide adequate protection for our trade secrets, know-how, or other proprietary information. For example, although we have a policy of requiring our consultants, advisors and collaborators to enter into confidentiality agreements and our employees to enter into invention, non-disclosure and, where lawful, noncompete agreements, we cannot assure you that such agreements will provide for a meaningful protection of our trade secrets, know-how or other proprietary information in the event of any unauthorized use or disclosure of information, including as a result of breaches of our physical or electronic security systems, or as a result of our employees failing to abide by their confidentiality obligations during or upon termination of their employment with us. Any action to enforce our rights is likely to be time-consuming and expensive, and may ultimately be unsuccessful, or may result in a remedy that is not commercially valuable. These risks are heightened in countries where laws or law enforcement practices may not protect proprietary rights as fully as in the United States. Any unauthorized use or disclosure of, or access to, our trade secrets, know-how or other proprietary information, whether accidentally or through willful misconduct, could have a material and adverse effect on our programs, our business strategy, and on our ability to compete effectively.

If our trademarks and trade names are not adequately protected, we may not be able to build name recognition in our markets of interest, and our business may be adversely affected.

Failure to maintain our trademark registrations, or to obtain new trademark registrations in the future, could limit our ability to protect our trademarks and impede our marketing efforts in the countries in which we operate. We may not be able to protect our rights to trademarks and trade names which we may need to build name recognition with potential partners or customers in our markets of interest. As a means to enforce our trademark rights and prevent infringement, we may be required to file trademark claims against third parties or initiate trademark opposition proceedings. This can be expensive, particularly for a company of our size, and time-consuming, and we may not be successful. Our registered or unregistered trademarks or trade names may be challenged, infringed, circumvented, declared generic or determined to be infringing on other marks.

Our pending trademark applications in the United States and in other foreign jurisdictions where we may file may not be allowed or may subsequently be opposed. Even if these applications result in registration of trademarks, third parties may challenge our use or registration of these trademarks in the future. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected.

We may be subject to claims that our employees, consultants, or independent contractors have wrongfully used or disclosed confidential information of third parties.

We employ individuals who were previously employed at other companies in the industries in which we operate, including biotechnology, pharmaceutical or medical device companies. We may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or willfully used or disclosed confidential information of our employees' former employers or other third parties. We may also be subject to claims that our employees' former employers or other third parties have an ownership interest in our patents. Litigation may be necessary to defend against these claims, and if we are unsuccessful, we could be required to pay substantial damages and could lose rights to important intellectual property.

Even if we are successful, litigation could result in substantial costs to us and could divert the time and attention of our management and other employees.

Risks Related to Ownership of Our Common Stock

The market price of our common stock has fluctuated in the past, and is likely to continue to be volatile, which could subject us to litigation.

The market price of our common stock has fluctuated and is likely to be subject to further wide fluctuations in response to numerous factors, many of which are beyond our control, such as those in this "Risk Factors" section and others including:

- actual or anticipated variations in our and our competitors' operating results;
- announcements by us or our competitors of new products, product development results, significant acquisitions or divestitures, strategic and commercial partnerships and relationships, joint ventures, collaborations or capital commitments;
- issuance of new securities analysts' reports or changed recommendations for our stock;
- periodic fluctuations in our revenue;
- actual or anticipated changes in regulatory oversight of our products under development;
- developments or disputes concerning our intellectual property or other proprietary rights or alleged infringement of third party's rights by us or our products under development;
- commencement of, or our involvement in, litigation or other proceedings;
- announcement or expectation of additional debt or equity financing efforts;
- sales of our common stock by us, our insiders or our other stockholders;
- any major change in our management; and
- general economic conditions and slow or negative growth of our markets, including slow or negative growth in the biotechnology industry generally.

In addition, if the stock market experiences uneven investor confidence, the market price of our common stock could decline for reasons unrelated to our business, operating results, or financial condition. The market price of our common stock might also decline in reaction to events that affect other companies within, or outside, our industry even if these events do not directly affect us. Some companies that have experienced volatility in the trading price of their stock have been the subject of securities class action litigation. If we are the subject of such litigation, it could result in substantial costs and a diversion of our management's attention and resources.

We may fail to qualify for continued listing on Nasdaq, which could make it more difficult for our stockholders to sell their shares.

We are required to satisfy the continued listing requirements of Nasdaq to maintain such listing, including, among other things, the maintenance of a market value of our common stock of at least $50 million.

For example, on December 11, 2023, we received formal notice from Nasdaq indicating that we no longer satisfy the $50 million market value of listed securities requirement for continued listing on Nasdaq (the "MVLS Rule"). In accordance with Nasdaq Listing Rule 5810(c)(3)(C), we will have 180 calendar days, or until June 10, 2024 (the "Compliance Date"), to regain compliance with the MVLS Rule. To regain compliance with the MVLS Rule, our MVLS must equal or exceed $50 million for a minimum of ten consecutive business days at any time prior to the Compliance Date. If we regain compliance with the MVLS Rule, Nasdaq will provide us with written confirmation and will close the matter.

If we do not regain compliance with the MVLS Rule by the Compliance Date, we will receive written notification that our securities are subject to delisting. At that time, we may appeal the delisting determination to a Hearings Panel or we may be eligible to transfer the listing of our securities to The Nasdaq Capital Market (provided that we then satisfy the requirements for continued listing on that market).

There can be no assurance that we will be able to regain compliance with Nasdaq's continued listing requirements. If our stock price does not increase or if we are unable to raise additional funds, and if our market capitalization does not meet the minimum standards, we may not be able to meet the standards for continued listing on Nasdaq within the compliance period. In the event that we do not regain compliance with the Nasdaq Listing Rules, we expect to receive written notification that our common stock is subject to delisting. If our common stock is delisted by Nasdaq, we could face significant material adverse consequences, including:

- a limited availability of market quotations for our common stock;
- an adverse effect on the market price of our common stock;
- loss of confidence from stakeholders, employees, and potential business partners;
- reduced liquidity with respect to our common stock;
- a determination that our shares are "penny stock," which will require brokers trading in our shares to adhere to more stringent shares, and which may limit demand for our common stock among certain investors;
- a limited amount of news and analyst coverage for our company; and
- a decreased ability to issue additional securities or obtain additional financing in the future.

Our common stock may become the target of "short squeezes."

In the recent past, the securities of several companies have increasingly experienced significant and extreme volatility in stock price due to short sellers of shares of their stock and buy-and-hold decisions of other investors, resulting in what is sometimes described as a "short squeeze." Short squeezes have caused extreme volatility in the stock prices of those companies and in the market and have led to the price per share of some of those companies to trade at a significantly inflated rate that is disconnected from the underlying value of the company. Sharp rises in a company's stock price may force traders in a short position to buy the stock to avoid even greater losses. Investors who purchase shares in those companies at an inflated rate face the risk of losing a significant portion of their original investment as the price per share has declined steadily as interest in those stocks have abated. Market activity suggests that we have been the target of a short squeeze, and this could occur again at any time, and stockholders may lose a significant portion or all of their investment if they purchase our shares at a rate that is significantly disconnected from our underlying value.

The issuance of shares of our common stock upon conversion of the Convertible Notes and exercise of warrants will dilute the ownership interests of our stockholders and could depress the trading price of our common stock.

We must settle conversions of our outstanding Convertible Notes and exercise of our outstanding warrants in shares of our common stock, together with cash in lieu of issuing any fractional share in the case of the Convertible Notes. The issuance of shares of our common stock upon conversion of the Convertible Notes or exercise of the warrants will dilute the ownership interests of our stockholders, which could depress the trading price of our common stock. In addition, the market's expectation that conversions or exercises may occur could depress the trading price of our common stock even in the absence of actual conversions or exercises. Moreover, the expectation of conversions or exercises could encourage the short selling of our common stock, which could place further downward pressure on the trading price of our common stock.

Hedging activity by investors in the Convertible Notes and warrants could depress the trading price of our common stock.

We expect that many investors in our outstanding Convertible Notes and warrants will seek to employ an arbitrage strategy. Under this strategy, investors typically short sell a certain number of shares of our common stock and adjust their short position over time while they continue to hold the Convertible Notes or warrants. Investors may also implement this type of strategy by entering into swaps on our common stock in lieu of, or in addition to, short selling shares of our common stock. This market activity, or the market's perception that it will occur, could depress the trading price of our common stock.

Provisions in the indentures governing our outstanding Convertible Notes could delay or prevent an otherwise beneficial takeover of us.

Certain provisions in our Convertible Notes and the indentures governing the Convertible Notes could make a third-party attempt to acquire us more difficult or expensive. For example, if a takeover constitutes a "fundamental change" (which is defined in the indentures to include certain change-of-control events and the delisting of our common stock), then noteholders will have the right to require us to repurchase their Convertible Notes for cash. In addition, if a takeover constitutes a "make-whole fundamental change"

(which is defined in the indentures to include, among other events, fundamental changes and certain additional business combination transactions), then we may be required to temporarily increase the conversion rate for the Convertible Notes. In either case, and in other cases, our obligations under the Convertible Notes and the indentures could increase the cost of acquiring us or otherwise discourage a third party from acquiring us or removing incumbent management, including in a transaction that holders of our common stock may view as favorable.

We may be unable to raise the funds necessary to repurchase the Convertible Notes for cash following a fundamental change or to pay any cash amounts due upon conversion, and our other indebtedness may limit our ability to repurchase our outstanding Convertible Notes.

Noteholders may require us to repurchase their Convertible Notes following a "fundamental change" (which is defined in the indentures governing the Convertible Notes to include certain change-of-control events and the delisting of our common stock) at a cash repurchase price generally equal to the principal amount of the Convertible Notes to be repurchased, plus accrued and unpaid interest, if any. Furthermore, additional cash amounts may be due upon conversion in certain circumstances if the number of shares that we deliver upon conversion of the Convertible Notes is limited by Nasdaq listing standards. We may not have enough available cash or be able to obtain financing at the time we are required to repurchase the Convertible Notes or pay these cash amounts upon their conversion. In addition, applicable law, regulatory authorities and the agreements governing our other indebtedness may restrict our ability to repurchase the Convertible Notes or pay these cash amounts upon their conversion. Our failure to repurchase Convertible Notes when required or pay these cash amounts upon their conversion will constitute a default under the indentures governing the Convertible Notes. A default under the Indenture or the fundamental change itself could also lead to a default under agreements governing our other indebtedness, which may result in that other indebtedness becoming immediately payable in full. We may not have sufficient funds to satisfy all amounts due under the other indebtedness and the Convertible Notes.

The accounting method for the Convertible Notes could adversely affect our reported financial results.

The accounting method for reflecting the underlying shares of our common stock in our reported diluted earnings per share may adversely affect our reported earnings and financial condition. We expect that, under applicable accounting principles, the shares underlying our Convertible Notes will be reflected in our diluted earnings per share using the "if-converted" method. Under that method, diluted earnings per share would generally be calculated assuming that all the Convertible Notes were converted into shares of common stock at the beginning of the reporting period, unless the result would be anti-dilutive. The application of the if-converted method may further increase our reported diluted loss per share.

Furthermore, the conversion features in our Convertible Notes are accounted for as free-standing embedded derivatives bifurcated from the principal balance of the Convertible Notes. The embedded derivative liabilities are remeasured at fair value each reporting period with positive or negative changes in fair value recorded in our consolidated statement of operations, which may adversely affect our reported earnings and financial condition and result in significant fluctuations in our future financial performance.

General Risk Factors

Insiders have substantial control over us and will be able to influence corporate matters.

As of December 31, 2023, our current directors and executive officers, together with their affiliates, have significant ownership of our outstanding common stock. As a result, these stockholders, if they act, will be able to exercise significant influence over all matters requiring stockholder approval, including the election of directors and approval of significant corporate transactions, such as a merger or other sale of our company or its assets. They may have interests that differ from yours and may vote in a way with which you disagree and that may be adverse to your interests. This concentration of ownership could limit stockholders' ability to influence corporate matters and may have the effect of delaying, deterring or preventing a third party from acquiring control over us, depriving our stockholders of an opportunity to receive a premium for their common stock as part of a sale of our company, and could negatively impact the value and market price of our common stock.

Future sales and issuances of our common stock or rights to purchase common stock, including pursuant to our equity incentive plans, could result in additional dilution of the percentage ownership of our stockholders and could cause the stock price of our common stock to decline.

In the future, we may sell common stock, convertible securities, or other equity securities in one or more transactions at prices and in a manner we determine from time to time. We also expect to issue common stock to employees, directors, and consultants pursuant to our equity incentive plans. If we sell common stock, convertible securities, or other equity securities in subsequent transactions, or common stock is issued pursuant to equity incentive plans, investors may be materially diluted. New investors in such subsequent transactions could gain rights, preferences, and privileges senior to those of holders of our common stock.

Sales of a substantial number of shares of our common stock in the public market, including through our ATM Facility or by our existing stockholders, or the perception that these sales might occur could depress the market price of our common stock and could impair our ability to raise capital through the sale of additional equity securities. We are unable to predict the effect that sales may have on the prevailing market price of our common stock.

We are an emerging growth company and the reduced disclosure requirements applicable to emerging growth companies may make our common stock less attractive to investors.

We are an emerging growth company. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards until such time as those standards apply to private companies. We have elected to avail ourselves of this exemption and, as a result, will not be subject to the same implementation timing for new or revised accounting standards as are required of other public companies that are not emerging growth companies, which may make comparison of our consolidated financial information to those of other public companies more difficult.

For as long as we continue to be an emerging growth company, however, we intend to take advantage of certain other exemptions from various reporting requirements that are applicable to other public companies including, but not limited to, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. We cannot predict if investors will find our common stock less attractive because we will rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile and experience decreases.

We will remain an emerging growth company until the earliest of (a) the end of the fiscal year (i) following the fifth anniversary of the closing of our IPO, (ii) in which the market value of our common stock that is held by non-affiliates exceeds $700 million and (iii) in which we have total annual gross revenues of $1.235 billion or more during such fiscal year, and (b) the date on which we issue more than $1 billion in non-convertible debt in a three-year period.

We have previously identified material weaknesses in our internal control over financial reporting. If additional material weaknesses in our internal control over financial reporting are discovered or occur in the future, our consolidated financial statements may contain material misstatements and we could be required to restate our financial results, which could adversely affect our stock price and result in an inability to maintain compliance with applicable stock exchange listing requirements.

We previously concluded that there were matters that constituted material weaknesses in our internal control over financial reporting that have since been remediated. A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of our annual or interim financial statements will not be prevented or detected and corrected on a timely basis. The material weaknesses related to a lack of (i) controls, as related to our historical testing business prior to our Strategic Transformation, designed to reconcile tests performed and recognized as revenue to billed tests and (ii) appropriately designed or effectively operating controls over the proper recording of accounts payable and accrued liabilities.

If additional material weaknesses in our internal control over financial reporting are discovered or occur in the future, our consolidated financial statements may contain material misstatements and we could be required to restate our financial results. If we are unable to successfully remediate any material weaknesses in our internal controls or if we are unable to produce accurate and timely financial statements, our stock price may be adversely affected, and we may be unable to maintain compliance with applicable stock exchange listing requirements.

If securities or industry analysts do not publish research or publish inaccurate or unfavorable research about our business, our stock price and trading volume could decline.

The trading market for our common stock depends in part on the research and reports that securities or industry analysts publish about us or our business. If few securities analysts provide coverage of us, or if industry analysts cease coverage of us, the trading price and volume for our common stock could be adversely affected. If one or more of the analysts who cover us downgrade our common stock or publish inaccurate or unfavorable research about our business, our common stock price would likely decline. If one or more of these analysts cease coverage of us or fail to publish reports on us regularly, demand for our common stock could decrease, which might cause our common stock price and trading volume to decline.

Provisions in our certificate of incorporation and bylaws and Delaware law might discourage, delay or prevent a change in control of our company or changes in our management and, therefore, depress the market price of our common stock.

Our eighth amended and restated certificate of incorporation, as amended and our second amended and restated bylaws contain provisions that could depress the market price of our common stock by acting to discourage, delay, or prevent a change in control of our company or changes in our management that the stockholders of our company may deem advantageous. These provisions, among other things:

- authorize the issuance of "blank check" preferred stock that our board of directors could use to implement a stockholder rights plan;
- prohibit stockholder action by written consent, which requires stockholder actions to be taken at a meeting of our stockholders, except for so long as specified stockholders hold in excess of 50% of our outstanding common stock;
- prohibit stockholders from calling special meetings of stockholders;
- establish advance notice requirements for nominations for election to our board of directors or for proposing matters that can be acted upon by stockholders at annual stockholder meetings;
- provide the board of directors with sole authorization to establish the number of directors and fill director vacancies; and
- provide that the board of directors is expressly authorized to make, alter, or repeal our second amended and restated bylaws.

In addition, Section 203 of the Delaware General Corporation Law may discourage, delay, or prevent a change in control of our company. Section 203 imposes certain restrictions on mergers, business combinations and other transactions between us and holders of 15% or more of our common stock.

Our certificate of incorporation provides that the Court of Chancery of the State of Delaware will be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our eighth amended and restated certificate of incorporation, as amended to date, provides that, unless we consent in writing to the selection of an alternative forum, the sole and exclusive forum, to the fullest extent permitted by law, for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a breach of a fiduciary duty owed by any director, officer or other employee to us or our stockholders, (3) any action asserting a claim against us or any director, officer or other employee arising pursuant to the Delaware General Corporation Law, (4) any action to interpret, apply, enforce or determine the validity of our eighth amended and restated certificate of incorporation, as amended to date, and our second amended and restated bylaws, or (5) any other action asserting a claim that is governed by the internal affairs doctrine, shall be the Court of Chancery of the State of Delaware (or another state court or the federal court located within the State of Delaware if the Court of Chancery does not have or declines to accept jurisdiction), in all cases subject to the court's having jurisdiction over indispensable parties named as defendants. In addition, our eighth amended and restated certificate of incorporation, as amended to date, provides that the federal district courts of the United States will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act but that the forum selection provision will not apply to claims brought to enforce a duty or liability created by the Exchange Act. Although we believe these provisions benefit us by providing increased consistency in the application of Delaware law for the specified types of actions and proceedings, the provisions may have the effect of discouraging lawsuits against us or our directors and officers. Alternatively, if a court were to find the choice of forum provision contained in our eighth amended and restated certificate of incorporation, as amended to date, and our second amended and restated bylaws to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could harm our business, financial condition, and operating results. For example, under the Securities Act, federal courts have concurrent jurisdiction over all suits brought to enforce any duty or liability created by the Securities Act, and investors cannot waive compliance with the federal securities laws and the rules and regulations thereunder. Any person or entity purchasing or otherwise acquiring any interest in our shares of capital stock shall be deemed to have notice of and consented to this exclusive forum provision, but will not be deemed to have waived our compliance with the federal securities laws and the rules and regulations thereunder.

Item 1B. Unresolved Staff Comments.

None.

Item 1C. Cybersecurity

In the ordinary course of our business, we collect, use, store, and transmit digitally large amounts of confidential, sensitive, proprietary, personal, and protected health information. The secure maintenance of this information and our information technology systems is important to our operations and business strategy. To this end, we have implemented processes designed to assess, identify, and manage risks from potential unauthorized occurrences on or through our information technology systems that may result in adverse effects on the confidentiality, integrity, and availability of these systems and the data residing therein. These processes are managed and monitored by our information technology department, which is led by our Director of Information Technology, and include mechanisms, controls, technologies, systems, and other processes designed to prevent or mitigate data loss, theft, misuse, or other security incidents or vulnerabilities affecting the data and maintain a stable information technology environment. For example, we conduct vulnerability testing, data recovery testing, security audits, and ongoing risk assessments, including due diligence on our key technology vendors, and other contractors and suppliers. We also conduct regular employee training on cyber and information security, among other topics. In addition, we consult with outside advisors and experts, when appropriate, to assist with assessing, identifying, and managing cybersecurity risks, including to anticipate future threats and trends, and their impact on the Company's risk environment.

Our Director of Information Technology, who has over 15 years of experience managing information technology and cybersecurity matters and holds a Master's Degree in computer science with a concentration in cybersecurity, together with our senior leadership team, is responsible for assessing and managing cybersecurity risks. We consider cybersecurity, along with other significant risks that we face, within our overall enterprise risk management framework. We have not identified risks from known cybersecurity threats, including as a result of any prior cybersecurity incidents, that have materially affected us, but we face certain ongoing cybersecurity risks threats that, if realized, are reasonably likely to materially affect us. Additional information on cybersecurity risks we face is discussed in Part I, Item 1A, "Risk Factors," under the heading "Our internal information technology systems, or those of any of our third party service providers, or potential future collaborators, may fail or suffer security or data privacy breaches or other unauthorized or improper access to, use of, or destruction of our proprietary or confidential data, employee data or personal data, which could result in additional costs, loss of revenue, significant liabilities, harm to our brand and material disruption of our operations."

Our Board of Directors, as a whole and at the committee level, has oversight of the most significant risks facing us and our processes to identify, prioritize, assess, manage, and mitigate those risks. Our Audit Committee, which is comprised solely of independent directors, oversees our cybersecurity risks. The Audit Committee receives regular updates on cybersecurity and information technology matters and related risk exposures from our Director of Information Technology as well as other members of the senior leadership team. The Board also receives updates from management and the Audit Committee on cybersecurity risks on at least an annual basis.

Item 2. Properties.

We currently lease approximately 15,400 square feet of office space in San Diego, California under a lease agreement that expires in June 2025. Additionally, we lease approximately 10,500 square feet of office and laboratory space in San Diego, California under a lease agreement that expires in January 2027. We also lease approximately 4,500 square feet of office and laboratory space in Dallas, Texas under a lease agreement that expires in August 2026. We believe our existing facilities will be sufficient for our needs for the foreseeable future.

Item 3. Legal Proceedings.

The information in Note 9, "Commitments and Contingencies" to the audited financial statements included in this Annual Report on Form 10-K is incorporated herein by reference. There are no matters which constitute material pending legal proceedings to which we are a party other than those incorporated into this item by reference to Note 9 to the consolidated financial statements for the year ended December 31, 2023.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information

Our common stock, par value $0.001 per share, is traded on Nasdaq under the symbol "BIOR".

Holders

As of March 20, 2024, there were approximately 50 stockholders of record of our common stock. Since many of our shares of common stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of stockholders represented by these record holders.

Dividends

We anticipate that we will retain earnings, if any, to support operations and research and development activities and finance the growth and development of our business and, therefore, do not expect to pay cash dividends in the foreseeable future. In addition, the terms of our Convertible Notes restrict our ability to pay dividends, subject to certain exceptions.

Recent Sales of Unregistered Securities

None.

Item 6. Reserved.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our financial statements and notes thereto and other financial information included elsewhere in this Annual Report. Some of the information contained in this discussion and analysis includes forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those described in or implied by these forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those identified below and those discussed in the section titled "Risk Factors" included elsewhere in this Annual Report.

Overview

We are a clinical-stage biotechnology company developing oral biotherapeutics that could enable new treatment approaches in the delivery of therapeutics. Our pipeline includes two therapeutic delivery platforms:

- **NaviCap™ Targeted Oral Delivery Platform**: Delivery of therapeutics to the site of disease in the gastrointestinal ("GI") tract designed to improve outcomes for patients with Inflammatory Bowel Disease; and
- **BioJet™ Systemic Oral Delivery Platform**: Designed to replace injection with needle-free, oral delivery of large molecules for better management of chronic diseases.

Our mission is to reimagine therapeutics and their delivery. By creating innovative smart pills designed for targeted drug delivery to the GI tract and systemic, needle-free delivery of biotherapeutics, we are developing therapies intended to improve patients' lives.

Our historical operations included a licensed Clinical Laboratory Improvement Amendments and College of American Pathologists certified laboratory specializing in the molecular testing markets serving women's health providers in the obstetric, gynecological, fertility, and maternal fetal medicine specialty areas. Previously, our core business was focused on carrier screening and noninvasive prenatal test market, targeting preconception planning and routine pregnancy management for genetic disease risk assessment. Through our former affiliation with Mattison Pathology, LLP, a Texas limited liability partnership doing business as Avero, our historical operations also included anatomic and molecular pathology testing products in the United States.

Common Stock Reverse Split

On December 29, 2022, we filed a certificate of amendment to our eighth amended and restated certificate of incorporation (the "Certificate of Amendment") to effect, as of January 3, 2023, a 1-for-25 reverse split of our common stock. The Certificate of Amendment also decreased the number of authorized shares of our common stock from 350,000,000 to 164,000,000. All shares, options, restricted stock units, warrants and per share amounts included in this Annual Report have been retroactively adjusted to reflect the stock split.

Factors Affecting Our Performance

Our business involves significant investment in research and development activities for the development of new products. We intend to continue investing in our pipeline of new products and technologies. We expect our investment in research and development to increase as we pursue regulatory approval of our targeted therapeutics and systemic therapeutics product candidates. The achievement of key development milestones is a key factor in evaluating our performance.

We expect to continue to incur significant expenses and increasing operating losses in the near term. We expect our expenses may increase in connection with our ongoing activities as we:

- continue to advance the preclinical and clinical development of our lead targeted therapeutics and systemic therapeutics product candidates;
- initiate preclinical studies and clinical trials for additional targeted therapeutics and systemic therapeutics product candidates that we may identify in the future;
- increase personnel and infrastructure to support our clinical development, research and manufacturing efforts;
- build out and expand our in-house process development and engineering and manufacturing capabilities for research and development and clinical purposes;
- continue to develop, perfect and defend our intellectual property portfolio; and

- incur additional legal, accounting or other expenses in operating our business, including the additional costs associated with operating as a public company.

We do not expect to generate significant product revenue unless and until we successfully complete development and obtain regulatory and marketing approval of, and begin to sell, one or more of our targeted therapeutics and systemic therapeutics product candidates, which we expect will take several years. We expect to spend a significant amount in development costs prior to such time. We may never succeed in achieving regulatory and marketing approval for our therapeutics product candidates. We may obtain unexpected results from our preclinical and clinical trials. We may elect to discontinue, delay or modify preclinical and clinical trials of our therapeutics product candidates. A change in the outcome of any of these variables with respect to the development of a product candidate could mean a significant change in the costs and timing associated with the development of that product candidate. Accordingly, until such time as we can generate significant product revenue, if ever, we expect to continue to seek private or public equity and debt financing to meet our capital requirements. There can be no assurance that such funding may be available to us on acceptable terms, or at all, or that we will be able to commercialize our therapeutics product candidates. In addition, we may not be profitable even if we commercialize any of our therapeutics product candidates.

Key Components of Our Results of Operations

We are providing the following summary of our revenues, research and development expenses and selling, general and administrative expenses to supplement the more detailed discussion below. This summary excludes our revenues, research and development expenses, selling and marketing, general and administrative and other expenses associated with our Laboratory Operations, which are reported within loss from discontinued operations.

Revenue

Historically, all of our revenue has been derived from molecular laboratory tests, principally from the sale of NIPT, genetic carrier screening, and pathology molecular testing. If our development efforts for our targeted therapeutics and systemic therapeutics product candidates are successful and result in regulatory approval, we may generate revenue from future product sales. If we enter into license or collaboration agreements for any of our therapeutics product candidates, other pipeline products or intellectual property, we may generate revenue in the future from payments as a result of such license or collaboration agreements. We cannot predict if, when, or to what extent we will generate revenue from the commercialization and sale of our therapeutics product candidates or from license or collaboration agreements. We may never succeed in obtaining regulatory approval for any of our therapeutics product candidates.

Research and Development

Research and development expenses consist primarily of costs associated with developing our therapeutics product candidates. Research and development expenses also consist of personnel expenses, including salaries, bonuses, stock-based compensation expense, benefits, consulting costs, and allocated overhead costs. Research and development costs are expensed as incurred.

We plan to continue investing in research and development activities for the foreseeable future as we focus on our targeted therapeutics and systemic therapeutics programs through preclinical studies and clinical trials. We expect our investment in research and development to remain flat in 2024 as we continue clinical trials for our product candidates.

Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. While we plan to partner with large pharmaceutical companies, especially for the later stage clinical work, we still expect our research and development expenses to increase over the next several years as we conduct additional preclinical studies and clinical trials, including later-stage clinical trials, for our current and future product candidates and pursue regulatory approval of our product candidates. The process of conducting the necessary preclinical and clinical research to obtain regulatory approval is costly and time consuming. The actual probability of success for our product candidates may be affected by a variety of factors including:

- the safety and efficacy of our product candidates;
- early clinical data for our product candidates;
- investment in our clinical programs;
- the ability of collaborators to successfully develop our licensed product candidates;
- competition;
- manufacturing capability; and

- commercial viability.

We may never succeed in achieving regulatory approval for any of our product candidates due to the uncertainties discussed above. We are unable to determine the duration and completion costs of our research and development projects or when and to what extent we will generate revenue from the commercialization and sale of our product candidates, if ever.

Selling, General and Administrative

Selling, general and administrative expenses consist primarily of personnel costs, including salaries, bonuses, stock-based compensation expense, and benefits, for our finance and accounting, legal, human resources, and other administrative teams. Additionally, these expenses include costs for communications, conferences, and professional fees of audit, legal, and recruiting services. Additionally, expenses related to maintaining compliance with the stipulations of the government settlement and the legal costs associated with the legal matters described in Note 9, "Commitments and Contingencies" in this Annual Report are included. We expect our selling, general and administrative expenses to decrease in 2024.

Interest Expense, Net

Interest expense, net is primarily attributable to borrowings under our credit and security agreements, lease agreements and interest income earned from our cash and cash equivalents.

Gain on Warrant Liabilities

Gain on warrant liabilities consists of losses on warrant issuances and changes in the fair value of our liability-classified warrants to purchase common stock.

Other (Expense) Income, Net

Other (expense) income, net primarily consists of changes in the fair value of our derivative liabilities related to the 2028 Convertible Notes, inducement loss and extinguishment loss on the Convertible Notes, gains and losses on investments, impairment of property and equipment, and loss on disposals of property and equipment.

Income Tax Provision

We account for income taxes under the asset-and-liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax basis, and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

We recognize the effect of income tax positions only if those positions are more likely than not of being sustained. Recognized income tax positions are measured at the largest amount that is more than 50% likely of being realized. Changes in recognition or measurement are recognized in the period in which the change in judgment occurs. Valuation allowances are established, when necessary, to reduce deferred tax assets to the amount expected to be realized. Due to losses generated in the past and projected future taxable losses anticipated in the future, we established a 100% valuation allowance on net deferred tax assets.

Results of Operations.

Comparison of the Years Ended December 31, 2023 and 2022

	Year Ended December 31,		
	2023	2022	Change
	(in thousands)		
Statement of Operations Data:			
Revenues	$ 4	$ 305	$ (301)
Operating expenses:			
Research and development	29,838	24,049	5,789
Selling, general and administrative	37,309	38,037	(728)
Total operating expenses	67,147	62,086	5,061
Loss from operations	(67,143)	(61,781)	(5,362)
Interest expense, net	(9,815)	(10,990)	1,175
Gain on warrant liabilities	18,004	20,904	(2,900)
Other (expense) income, net	(65,470)	2,617	(68,087)
Loss before income taxes	(124,424)	(49,250)	(75,174)
Income tax benefit	(90)	(420)	330
Loss from continuing operations	(124,334)	(48,830)	(75,504)
Gain from discontinued operations	219	10,673	(10,454)
Net loss	$ (124,115)	$ (38,157)	$ (85,958)

Research and Development Expenses

Research and development expenses increased by $5.8 million for the year ended December 31, 2023 compared to the year ended December 31, 2022, primarily attributable to an increase in salary and benefits, consulting and professional fees, clinical trial expenses and supplies costs, offset by a decrease in facilities costs.

Selling, General and Administrative Expenses

Selling, general and administrative expenses decreased by $0.7 million for the year ended December 31, 2023 compared to the year ended December 31, 2022, primarily attributable to an increase in salary and benefits and consulting and professional fees, offset by a decrease in software costs, business insurance and facilities costs.

Interest Expense, Net

Interest expense, net decreased by $1.2 million for the year ended December 31, 2023 compared to the year ended December 31, 2022, primarily due to a decrease in the balance of 2025 Convertible Notes from the September and December note exchanges.

Gain on Warrant Liabilities

Gain on warrant liabilities decreased by $2.9 million for the year ended December 31, 2023 compared to the year ended December 31, 2022, due to the loss on issuance of new warrants during the year and the change in fair value of the warrant liabilities for outstanding warrants.

Other (Expense) Income, Net

Other (expense) income, net decreased by $68.1 million for the year ended December 31, 2023 compared to the year ended December 31, 2022, primarily due to an inducement loss of $53.2 million, the remaining impact is due to an extinguishment loss on our 2025 Convertible Notes, a loss on the change in fair value of the derivative liabilities for the 2028 Convertible Notes, impairment on investment in Enumera Molecular, Inc. ("Enumera") and a gain on investment in Enumera for the year ended December 31, 2022 that did not reoccur for the year ended December 31, 2023.

Income Tax Benefit

Income tax benefit decreased by $0.3 million for the year ended December 31, 2023 compared to the year ended December 31, 2022, primarily due to prior year federal and state income tax refunds that did no reoccur for the year ended December 31, 2023.

Discontinued Operations

Gain from discontinued operations decreased by $10.5 million for the year ended December 31, 2023 compared to the year ended December 31, 2022 due to the closure of our Laboratory Operations during 2021. See Note 3 to our consolidated financial statements included elsewhere in this Annual Report for additional information regarding discontinued operations.

Liquidity and Capital Resources.

Since our inception, our primary sources of liquidity have been generated by our operations, sales of common stock, preferred stock, warrants to purchase common stock and preferred stock and cash from debt financings, including our Convertible Notes.

As of December 31, 2023, we had $15.0 million of cash and cash equivalents, $0.2 million of restricted cash and a working capital deficit. The face value of Convertible Notes outstanding was $51.1 million and our accumulated deficit as of December 31, 2023, was $951.0 million. For the year ended December 31, 2023, we had a net loss of $124.1 million and cash used in operations of $48.5 million. Our primary requirements for liquidity have been to fund our working capital needs, capital expenditures, research and development, and general corporate needs.

Based on our planned operations, we do not expect that our current cash and cash equivalents will be sufficient to fund our operations for at least 12 months from the issuance date of the consolidated financial statements for the year ended December 31, 2023, and we will require additional capital to fund our operations. As a result, substantial doubt exists about our ability to continue as a going concern for 12 months following the issuance date of the consolidated financial statements for the year ended December 31, 2023. We therefore intend to raise additional capital through equity offerings, including our ATM Facility, and/or debt financings or from other potential sources of liquidity, which may include new collaborations, licensing or other commercial agreements for one or more of our research programs or patent portfolios. Adequate funding, if needed, may not be available to us on acceptable terms, or at all. If we are unable to raise capital when needed or on attractive terms, we would be forced to delay, reduce or eliminate our research and development programs or other operations. If any of these events occur, our ability to achieve our operational goals would be adversely affected. Our future capital requirements and the adequacy of available funds will depend on many factors, including those described in "Risk Factors." Depending on the severity and direct impact of these factors on us, we may be unable to secure additional financing to meet our operating requirements on terms favorable to us, or at all. Our ability to raise additional funds may be adversely impacted by potential worsening global economic conditions and the recent disruptions to, and volatility in, the credit and financial markets in the United States and worldwide resulting from global political tensions and economic uncertainty.

Convertible Notes

See Note 7 "Convertible Notes" to the consolidated financial statements included in this Annual Report for information on our Convertible Notes.

Equity Financings

See Note 10 "Stockholders' Equity" to the consolidated financial statements included in this Annual Report for information on our equity financings.

Cash Flows

Our primary uses of cash are to fund our operations and research and development as we continue to grow our business. We expect to continue to incur operating losses in future periods as our operating expenses increase to support the growth of our business. We expect our research and development expenses to remain flat as we continue to focus on developing our therapeutics product candidates, through preclinical studies and clinical trials. Cash used to fund operating expenses is impacted by the timing of when we pay expenses, as reflected in the change in our outstanding accounts payable and accrued expenses.

The following table summarizes our cash flows for the periods indicated (in thousands):

	Year Ended December 31,	
	2023	2022
Cash used in operating activities	$ (48,499)	$ (64,417)
Cash provided by (used in) investing activities	2,443	(792)
Cash provided by financing activities	30,781	7,298

Operating Activities

Net cash used in operating activities in the year ended December 31, 2023 was primarily attributable to a $124.1 million net loss, adjusted for non-cash charges, primarily driven by a $53.2 million inducement loss, $16.5 million of stock-based compensation

expense, $6.4 million loss on extinguishment of convertible notes, $3.9 million change in fair value of derivative liabilities, $3.0 million loss on investment in Enumera, $1.6 million of debt discount amortization and non-cash interest and $0.6 million of depreciation and amortization, partially offset by a $18.0 million change in fair value of warrant liabilities. The net cash inflow from changes in operating assets and liabilities was attributable to a $10.7 million increase in accrued expenses and a $1.0 million decrease in prepaid and other current assets, offset by a $1.2 million decrease in accounts payable and a $1.9 million decrease in other long-term liabilities.

Net cash used in operating activities in the year ended December 31, 2022 was primarily attributable to a $38.2 million net loss, adjusted for non-cash charges, primarily driven by a $20.9 million change in the warrant liabilities fair value, a $10.7 million gain from discontinued operations and a $5.7 million gain on investment in Enumera, offset by $7.8 million of stock-based compensation expense, a $2.7 million loss on extinguishment of convertible notes and $1.4 million of debt discount amortization. The net cash outflow from changes in operating assets and liabilities was attributable to a $5.0 million decrease in accounts payable and a $1.7 million decrease in other long-term liabilities, offset by a $3.4 million decrease in prepaid expenses and other current assets. Additionally, net cash provided by operating activities from discontinued operations contributed $1.8 million of inflows.

Investing Activities

Net cash provided by investing activities during the year ended December 31, 2023 was primarily attributable to $2.5 million from discontinued operations, offset by $0.1 million in purchases of property and equipment. Net cash used in investing for the year ended December 31, 2022 was attributable to $0.8 million in purchases of property and equipment.

Financing Activities

Net cash provided by financing activities during the year ended December 31, 2023 was primarily attributable to $18.1 million in proceeds from the issuance of common stock, $10.0 million from the issuance of senior secured convertible notes and $8.0 million in proceeds from the issuance of common stock warrants, partially offset by $2.3 million in payments for insurance financing, $2.0 million in tax payments to settle RSUs and $1.1 million in payments of offering costs. Net cash provided by financing activities during the year ended December 31, 2022 was primarily attributable to $9.0 million in net proceeds from the issuance of common stock and $3.3 million in proceeds from the issuance of common stock warrants, partially offset by $5.1 million in payments for insurance financing.

Other Contractual Obligations and Commitments

See Note 9 to our consolidated financial statements included elsewhere in this Annual Report for additional information.

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our financial statements, which have been prepared in conformity with GAAP. The preparation of financial statements in accordance with GAAP requires management to make estimates and assumptions about future events that affect the amounts of assets and liabilities reported, disclosures about contingent assets and liabilities, and reported amounts of revenue and expenses. These estimates and assumptions are based on management's best estimates and judgment. Management regularly evaluates its estimates and assumptions using historical experience and other factors; however, actual results could differ materially from these estimates and could have an adverse effect on our financial statements.

While our significant accounting policies are more fully described in the notes to our consolidated financial statements elsewhere in this annual report, we believe that the accounting policies discussed below are most critical to understanding and evaluating our historical and future performance.

Assets Held for Sale and Discontinued Operations

Assets classified as held for sale are reported at the lower of their carrying value or fair value less costs to sell. Depreciation and amortization of assets ceases upon designation as held for sale. Discontinued operations comprise activities that were disposed of, discontinued or held for sale at the end of the period, represent a separate major line of business that can be clearly distinguished for operational and financial reporting purposes and represent a strategic business shift having a major effect on the Company's operations and financial results according to Accounting Standard Codification ("ASC") Topic 205, *Presentation of Financial Statements.* We have included all revenues and expenses for the genetics laboratory as discontinued operations and all remaining assets as held for sale.

Common Stock Warrant Liabilities

We account for common stock warrants as freestanding liability instruments in accordance with applicable accounting guidance based on the specific terms of the warrant agreement. As these warrants are classified as liabilities, they are remeasured each period until settled or until classified as equity. Any resulting gain or loss related to the changes in the fair value of the warrant liabilities are recorded to gain (loss) on warrant liabilities on the consolidated statements of operations. Changes in our inputs and assumptions, such as our stock price and the estimated volatility of common stock, could result in material changes in the valuation in future periods.

Risk-Free Interest Rate—The risk-free interest rate is calculated using the average of the published interest rates of U.S. Treasury zero-coupon issues with maturities that are commensurate with the expected term.

Expected Volatility—Given the limited period of time our stock has been traded in an active market, the expected volatility is estimated by taking the average historical volatility for industry peers, consisting of several public companies in the Company's industry that are similar in size, stage, or financial leverage, over a period of time commensurate with the expected term of the awards.

Fair Value of Common Stock—The fair value of our common stock is the closing price of our common stock on the date of valuation.

Expected Term—The expected term represents the remaining contractual term of the warrant.

At December 31, 2023 and December 31, 2022, the fair value of our warrant liabilities of $40.8 million and $3.5 million, respectively, was estimated using the Black-Scholes Model with the following inputs and assumptions:

	As of December 31,	
	2023	2022
Risk-free interest rate	3.8% - 4.1%	4.0%
Expected volatility	95.6% - 101.8%	106.2% - 107.1%
Stock price	$1.35	$3.30
Expected life (years)	2.5 - 5.0	3.6 - 5.4

Embedded Derivatives Related to Convertible Notes

In December 2023, we issued Convertible Notes due in December 2028 that have conversion options which required bifurcation upon issuance and remeasurement to fair value separately as embedded derivatives. The conversion options include redemption features, interest rate features and conversion features. We utilized a binomial pricing model to determine the fair value of the embedded features, which incorporates inputs including the common stock price, volatility of common stock, and time to maturity. The embedded features are remeasured to fair value at each balance sheet date, with a resulting gain or loss related to the change in the fair value recorded to other income (expense), net in the consolidated statements of operations. At December 31, 2023, the fair value of our embedded derivative liabilities of $22.9 million was estimated using a binomial pricing model with the following inputs and assumptions:

	As of December 31, 2023
Risk-free interest rate	3.8% - 4.3%
Expected volatility	84.3% - 95.7%
Stock price	$1.35
Discount Rate	28.7% - 28.9%

Stock-Based Compensation

We calculate the fair value of stock options using the Black-Scholes option pricing valuation model, which incorporates various assumptions including assumptions including volatility, expected term, and risk-free interest rate. Compensation related to service-based awards are recognized starting on the grant date on a straight-line basis over the vesting period, which is typically four years.

Determining the grant date fair value of options using the Black-Scholes option pricing model requires management to make assumptions and judgments. If any of the assumptions used in the Black-Scholes model change significantly, stock-based compensation for future awards may differ materially compared with the awards granted previously. The Company's key inputs and assumptions are as follows:

Fair Value of Common Stock—Prior to the IPO, our common stock was not publicly traded, therefore we estimated the fair value of common stock. Following the IPO, the fair value of our common stock for awards with service-based vesting is the closing price of our common stock on the date of grant or other relevant determination date.

Expected Term—The expected term represents the period that the stock-based awards are expected to be outstanding. We determines the expected term using the simplified method. The simplified method deems the term to be the average of the time-to-vesting and the contractual life. For stock options granted to non-employees, the expected term equals the remaining contractual term of the option from the vesting date. For the 2020 Employee Stock Purchase Plan, the expected term is the period of time from the offering date to the purchase date.

Expected Volatility—Given the limited period of time our stock has been traded in an active market, the expected volatility is estimated by taking the average historical volatility for industry peers, consisting of several public companies in the Company's industry that are similar in size, stage, or financial leverage, over a period of time commensurate with the expected term of the awards.

Risk-Free Interest Rate—The risk-free interest rate is calculated using the average of the published interest rates of U.S. Treasury zero-coupon issues with maturities that are commensurate with the expected term.

Dividend Rate—The dividend yield assumption is zero, as the Company has no plans to pay dividends.

The following assumptions were used for the Black-Scholes option valuation model:

	Year ended December 31,	
	2023	2022
Risk-free interest rate	3.5% - 4.7%	2.0% - 4.2%
Expected volatility	97.6% - 102.7%	90.7% - 101.3%
Expected dividend yield	—	—
Expected life (years)	5.5 - 6.3	5.5 - 6.3

Goodwill

Goodwill is an asset representing the future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognized. Goodwill is not amortized but instead is tested annually for impairment at the reporting unit level, or more frequently when events or changes in circumstances indicate that fair value of the reporting unit has been reduced to less than its carrying value. We may choose to perform a qualitative assessment to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount as a basis for determining whether it is necessary to perform a quantitative assessment.

If a quantitative assessment is deemed necessary, we compare the fair value of the reporting unit with its carrying amount, including goodwill. An impairment loss will be recognized if the reporting unit's carrying amount exceeds its fair value, to the extent that it does not exceed the total carrying amount of goodwill. No impairment existed as of December 31, 2023 or December 31, 2022.

Recent Accounting Pronouncements

Refer to Note 2, "Summary of Significant Accounting Policies" to the consolidated financial statements included in this Annual Report for information on recently issued accounting pronouncements.

JOBS Act Accounting Election

We are an emerging growth company, as defined in the JOBS Act. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act until such time as those standards apply to private companies. We have elected to use this extended transition period and, as a result, our financial statements may not be comparable to companies that comply with public company effective dates. We also intend to rely on other exemptions provided by the JOBS Act, including without limitation, not being required to comply with the auditor attestation requirements of Section 404(b) of the Sarbanes-Oxley Act of 2002, as amended.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

We are a smaller reporting company, as defined by Rule 12b-2 under the Securities and Exchange Act of 1934 and in Item 10(f)(1) of Regulation S-K, and are not required to provide the information under this item.

Item 8. Financial Statements and Supplementary Data

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Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Biora Therapeutics, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Biora Therapeutics, Inc. and subsidiaries (the Company) as of December 31, 2023 and 2022, the related consolidated statements of operations, stockholders' deficit, and cash flows for the years then ended, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2023 and 2022, and the results of its operations and its cash flows for the years then ended, in conformity with U.S. generally accepted accounting principles.

Going Concern

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the consolidated financial statements, the Company has suffered recurring losses from operations and has a working capital deficit and an accumulated deficit that raise substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2011.

San Diego, California
April 1, 2024

BIORA THERAPEUTICS, INC.
CONSOLIDATED BALANCE SHEETS
(In thousands, except share and per share data)

	December 31,	
	2023	2022
Assets		
Current assets:		
Cash, cash equivalents and restricted cash	$ 15,211	$ 30,486
Income tax receivable	830	828
Prepaid expenses and other current assets	3,030	4,199
Current assets of disposal group held for sale	—	2,603
Total current assets	19,071	38,116
Property and equipment, net	1,156	1,654
Right-of-use assets	1,614	1,482
Other assets	3,302	6,201
Goodwill	6,072	6,072
Total assets	$ 31,215	$ 53,525
Liabilities and Stockholders' Deficit		
Current liabilities:		
Accounts payable	$ 2,843	$ 3,606
Accrued expenses and other current liabilities	17,319	16,161
Warrant liabilities	40,834	3,538
Related party senior secured convertible notes, current portion	1,976	—
Total current liabilities	62,972	23,305
Convertible notes, net of unamortized discount of $259 and $4,914 as of December 31, 2023 and December 31, 2022, respectively	9,966	127,811
Senior secured convertible notes, net of unamortized discount of $11,066 and $0 as of December 31, 2023 and December 31, 2022, respectively (Note 7)	14,591	—
Related party senior secured convertible notes net of unamortized discount of $7,951 and $0 as of December 31, 2023 and December 31, 2022, respectively (including future interest of $9,747 and $0 as of December 31, 2023 and December 31, 2022, respectively) (Note 7)	19,179	—
Derivative liabilities	22,899	—
Other long-term liabilities	3,029	4,696
Total liabilities	$ 132,636	$ 155,812
Commitments and contingencies (Note 9)		
Stockholders' deficit:		
Common stock – $0.001 par value. 164,000,000 shares authorized as of December 31, 2023 and December 31, 2022; 28,574,918 and 9,098,844 shares issued as of December 31, 2023 and December 31, 2022, respectively; 27,837,563 and 8,928,498 shares outstanding as of December 31, 2023 and December 31, 2022, respectively	25	8
Additional paid-in capital	868,591	743,626
Accumulated deficit	(950,958)	(826,843)
Treasury stock – at cost; 737,355 and 170,346 shares of common stock as of December 31, 2023 and December 31, 2022, respectively	(19,079)	(19,078)
Total stockholders' deficit	(101,421)	(102,287)
Total liabilities and stockholders' deficit	$ 31,215	$ 53,525

See notes to consolidated financial statements.

BIORA THERAPEUTICS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except share and per share data)

	Year Ended December 31,	
	2023	2022
Revenues	$ 4	$ 305
Operating expenses:		
Research and development	29,838	24,049
Selling, general and administrative	37,309	38,037
Total operating expenses	67,147	62,086
Loss from operations	(67,143)	(61,781)
Interest expense, net	(9,815)	(10,990)
Gain on warrant liabilities	18,004	20,904
Other (expense) income, net	(65,470)	2,617
Loss before income taxes	(124,424)	(49,250)
Income tax benefit	(90)	(420)
Loss from continuing operations	(124,334)	(48,830)
Gain from discontinued operations	219	10,673
Net loss	$ (124,115)	$ (38,157)
Net loss per share from continuing operations, basic and diluted	$ (7.88)	$ (6.40)
Net gain per share from discontinued operations, basic and diluted	$ 0.01	$ 1.40
Net loss per share, basic and diluted	$ (7.87)	$ (5.00)
Weighted average shares outstanding, basic and diluted	15,773,297	7,635,107

See notes to consolidated financial statements.

BIORA THERAPEUTICS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' DEFICIT
(In thousands, except share data)

	Common Stock		Additional Paid-In	Accumulated	Treasury Stock		Total Stockholders'
	Shares	Amount	Capital	Deficit	Shares	Amount	Deficit
Balance at December 31, 2021	**7,429,458**	**$ 6**	**$ 722,782**	**$ (788,686)**	**(154,569)**	**$ (19,078)**	**$ (84,976)**
Issuance of common stock, net	1,117,155	1	9,281	—	—	—	9,282
Issuance of common stock under employee stock purchase plan	6,694	—	98	—	—	—	98
Issuance of common stock upon vesting of restricted stock units	45,287	—	(267)	—	(15,777)	—	(267)
Issuance of common stock upon conversion of interest, net	500,250	1	3,928	—	—	—	3,929
Stock-based compensation expense	—	—	7,804	—	—	—	7,804
Net loss	—	—	—	(38,157)	—	—	(38,157)
Balance at December 31, 2022	**9,098,844**	**$ 8**	**$ 743,626**	**$ (826,843)**	**(170,346)**	**$ (19,078)**	**$ (102,287)**
Issuance of common stock, net	8,245,273	6	17,482	—	—	—	17,488
Issuance of common stock upon vesting of restricted stock units	1,370,520	1	(1,960)	—	(567,009)	(1)	(1,960)
Issuance of common stock upon conversion of debt, net	9,860,281	10	67,421	—	—	—	67,431
Related party troubled debt restructuring	—	—	25,547	—	—	—	25,547
Stock-based compensation expense	—	—	16,475	—	—	—	16,475
Net loss	—	—	—	(124,115)	—	—	(124,115)
Balance at December 31, 2023	**28,574,918**	**$ 25**	**$ 868,591**	**$ (950,958)**	**(737,355)**	**$ (19,079)**	**$ (101,421)**

See notes to consolidated financial statements.

BIORA THERAPEUTICS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended December 31,	
	2023	2022
Operating Activities:		
Net loss	$ (124,115)	$ (38,157)
Adjustments to reconcile net loss to net cash used in operating activities:		
Gain from discontinued operations	(219)	(10,673)
Depreciation and amortization	555	907
Stock-based compensation expense	16,475	7,804
Loss on extinguishment of convertible notes and accrued interest	6,363	2,722
Amortization of debt discount	1,601	1,419
Inducement loss on convertible notes	53,198	—
Loss on disposal of property and equipment	15	543
Impairment of property and equipment	100	545
Change in fair value of derivative liabilities	3,915	—
Change in fair value of warrant liabilities	(18,004)	(20,904)
Loss (gain) on investment in Enumera Molecular, Inc.	3,000	(5,731)
Changes in operating assets and liabilities:		
Income tax receivable	(2)	(828)
Prepaid expenses and other current assets	998	3,387
Accounts payable	(1,172)	(5,072)
Accrued expenses and other liabilities	10,677	(417)
Other long-term liabilities	(1,884)	(1,720)
Net cash used in operating activities - continuing operations	(48,499)	(66,175)
Net cash provided by operating activities - discontinued operations	—	1,758
Net cash used in operating activities	(48,499)	(64,417)
Investing Activities:		
Purchases of property and equipment	(103)	(792)
Proceeds from sale of property and equipment	11	—
Net cash used in investing activities - continuing operations	(92)	(792)
Net cash provided by investing activities - discontinued operations	2,535	—
Net cash provided by (used in) investing activities	2,443	(792)
Financing Activities:		
Proceeds from issuance of common stock	18,137	9,014
Proceeds from issuance of common stock warrants	8,000	3,318
Tax payments to settle restricted stock units	(1,960)	—
Proceeds from issuance of common stock under employee stock purchase plan	—	98
Proceeds from issuance of senior secured convertible notes	10,000	—
Payments for financing of insurance premiums	(2,264)	(5,120)
Payments for offering costs	(1,132)	—
Principal payments on capital lease obligations	—	(12)
Net cash provided by financing activities	30,781	7,298
Net decrease in cash, cash equivalents and restricted cash	(15,275)	(57,911)
Cash, cash equivalents and restricted cash at beginning of period	30,486	88,397
Cash, cash equivalents and restricted cash at end of period	$ 15,211	$ 30,486

See notes to consolidated financial statements.

BIORA THERAPEUTICS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended December 31,	
	2023	**2022**
Supplemental disclosure of cash flow information:		
Cash paid for interest	$ 2,277	$ 5,871
Cash paid for income taxes	$ 18	$ 31
Supplemental schedule of non-cash investing and financing activities:		
Conversion of convertible notes to common stock and warrants	$ 51,000	$ —
Related party troubled debt restructuring	$ 25,547	$ —
Exchange of convertible notes for senior secured convertible notes and warrants	$ 18,000	$ —
Conversion of accrued interest in exchange for senior secured convertible notes	$ 6,953	$ —
Investment in Enumera Molecular Inc. in exchange for assets	$ —	$ 6,000
Issuance of common stock and re-priced warrants upon settlement of accrued interest	$ —	$ 3,929
Issuance of warrants upon settlement of accrued interest	$ —	$ 2,300
Leased assets obtained in exchange for operating lease liabilities	$ 1,344	$ 2,922
Change in fair value of re-priced equity classified warrants	$ —	$ 619
Equity financing issuance costs incurred but not paid	$ 49	$ 116
Debt issuance costs incurred but not paid	$ 350	$ —
Issuance of common stock in settlement of accrued expenses	$ —	$ 98
Purchases of property and equipment in accounts payable	$ 12	$ 86

See notes to consolidated financial statements.

BIORA THERAPEUTICS, INC.
Notes to Consolidated Financial Statements

Note 1. Organization and Description of Business

Biora Therapeutics, Inc. (the “Company” or “Biora” or "Biora Therapeutics") is a clinical-stage biotechnology company developing oral biotherapeutics that could enable new treatment approaches in the delivery of therapeutics. The Company's pipeline includes two therapeutic delivery platforms:

- NaviCap™ Targeted Oral Delivery Platform: Delivery of therapeutics to the site of disease in the gastrointestinal tract designed to improve outcomes for patients with Inflammatory Bowel Disease; and
- BioJet™ Systemic Oral Delivery Platform: Designed to replace injection with needle-free, oral delivery of large molecules for better management of chronic diseases.

Biora Therapeutics, a Delaware corporation, was formerly known as Progenity, Inc. (“Progenity”), and commenced operations in 2010 with its corporate office located in San Diego, California. The Company's historical operations included a licensed Clinical Laboratory Improvement Amendments and College of American Pathologists certified laboratory located in Michigan specializing in molecular testing markets serving women’s health providers in the obstetric, gynecological, fertility, and maternal fetal medicine specialty areas in the United States. Previously, the Company's core business was focused on the carrier screening and noninvasive prenatal test market, targeting preconception planning, and routine pregnancy management for genetic disease risk assessment. Through its former affiliation with Mattison Pathology, LLP, a Texas limited liability partnership doing business as Avero Diagnostics (“Avero”), the Company’s operations also included anatomic and molecular pathology testing products.

In order to refocus efforts and resources on its research and development pipeline, in June 2021, the Company announced a strategic transformation ("Strategic Transformation") that included the closure of the Progenity genetics laboratory and in December 2021, the Company sold Avero, together referred to as the Laboratory Operations. The Company has reported all revenues and expenses associated with its Laboratory Operations as discontinued operations; see Note 3 for additional information.

In April 2022, the Company announced that it would rebrand to better reflect the current focus on its therapeutics pipeline, and changed its name to Biora Therapeutics, Inc.

On December 29, 2022, the Company filed a certificate of amendment (the "Certificate of Amendment") to its eighth amended and restated certificate of incorporation to effect, as of January 3, 2023, a 1-for-25 reverse split of the Company's common stock (the "Reverse Stock Split"). On January 3, 2023, the Company effected the Reverse Stock Split. See Note 2 for additional information.

Liquidity

As of December 31, 2023, the Company had cash and cash equivalents of $15.0 million, restricted cash of $0.2 million and a working capital deficit. The Company had an accumulated deficit of $951.0 million as of December 31, 2023. For the year ended December 31, 2023, the Company reported a net loss of $124.1 million and cash used in operating activities of $48.5 million. The Company’s primary sources of capital have historically been the sale of common stock and warrants, private placements of preferred stock and the incurrence of debt. As of December 31, 2023, the Company had a face value of $40.9 million of 11.00%/13.00% convertible senior secured notes due 2028 ("2028 Convertible Notes") outstanding and a face value of $10.2 million of 7.25% convertible senior notes due 2025 ("2025 Convertible Notes" and together with the 2028 Convertible Notes, the "Convertible Notes") outstanding (see Note 7). Management does not expect that the Company's current cash and cash equivalents will be sufficient to fund its operations for at least 12 months from the issuance date of the consolidated financial statements for the year ended December 31, 2023, and will require additional capital to fund the Company's operations. As a result, substantial doubt exists about the Company’s ability to continue as a going concern for 12 months following the issuance date of the consolidated financial statements for the year ended December 31, 2023.

The Company’s ability to continue as a going concern is dependent upon its ability to raise additional funding. Management believes that the Company’s liquidity position as of the date of this filing provides sufficient runway to achieve important research and development pipeline milestones. Management intends to raise additional capital through equity offerings and/or debt financings, or from other potential sources of liquidity, which may include new collaborations, licensing or other commercial agreements for one or more of the Company’s research programs or patent portfolios or divestitures of the Company's assets. Adequate funding, if needed, may not be available to the Company on acceptable terms, or at all. The Company’s ability to raise additional funds may be adversely impacted by potential worsening global economic conditions and the disruptions to, and volatility in, the credit and financial markets in the United States and worldwide. If the Company is unable to raise capital when needed or on attractive terms, it would be forced to delay, reduce, or eliminate its research and development programs or other operations. If any of these events occur, the Company’s ability to achieve its operational goals would be adversely affected.

Note 2. Summary of Significant Accounting Policies

Basis of Presentation

The Company's financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America ("GAAP") and include the accounts of Biora Therapeutics and its wholly owned subsidiaries. All significant intercompany balances and transactions have been eliminated in consolidation.

The consolidated financial statements and notes thereto give retrospective effect, where applicable, to the Reverse Stock Split for all periods presented. All common stock, options exercisable for common stock, restricted stock units ("RSUs"), warrants and per share amounts contained in the consolidated financial statements have been retrospectively adjusted to reflect the Reverse Stock Split for all periods presented. Concurrent with the Reverse Stock Split the Company effected a reduction in the number of authorized shares of common stock from 350,000,000 shares to 164,000,000 shares.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities as of the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Significant items subject to such estimates include the valuation of stock options, the valuation of goodwill, the valuation of the derivative liabilities associated with the 2028 Convertible Notes, accrual for reimbursement claims and settlements, the valuation of warrant liabilities, the valuation of assets held for sale, assessing future tax exposure and the realization of deferred tax assets, and the useful lives and the recoverability of property and equipment. The Company bases these estimates on historical and anticipated results, trends, and various other assumptions that the Company believes are reasonable under the circumstances, including assumptions as to future events. These estimates form the basis for making judgments about the carrying values of assets and liabilities and recorded revenues and expenses that are not readily apparent from other sources. Actual results could differ from those estimates and assumptions.

Operating Segments

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker or decision-making group in making decisions on how to allocate resources and assess performance. The Company views its operations and manages its business as one operating segment. All revenues are attributable to U.S.-based operations and all assets are held in the United States.

Assets Held for Sale and Discontinued Operations

Assets and liabilities are classified as held for sale when all of the following criteria for a plan of sale have been met: (1) management, having the authority to approve the action, commits to a plan to sell the assets; (2) the assets are available for immediate sale, in their present condition, subject only to terms that are usual and customary for sales of such assets; (3) an active program to locate a buyer and other actions required to complete the plan to sell the assets have been initiated; (4) the sale of the assets is probable and is expected to be completed within one year; (5) the assets are being actively marketed for a price that is reasonable in relation to their current fair value; and (6) actions required to complete the plan indicate that it is unlikely that significant changes to the plan will be made or the plan will be withdrawn. When all of these criteria have been met, the assets and liabilities are classified as held for sale in the consolidated balance sheet. Assets classified as held for sale are reported at the lower of their carrying value or fair value less costs to sell. Depreciation and amortization of assets ceases upon designation as held for sale.

Discontinued operations comprise activities that were disposed of, discontinued or held for sale at the end of the period, represent a separate major line of business that can be clearly distinguished for operational and financial reporting purposes and represent a strategic business shift having a major effect on the Company's operations and financial results according to Accounting Standard Codification ("ASC") Topic 205, *Presentation of Financial Statements*.

Additional details surrounding the Company's assets and liabilities held for sale and discontinued operations are included in Note 3.

Cash and Cash Equivalents including Concentration of Credit Risk

The Company considers all highly liquid investment instruments purchased with an initial maturity of three months or less to be cash equivalents. The Company limits its exposure to credit loss by placing its cash and cash equivalents in financial institutions with high credit ratings. The Company's cash and cash equivalents may consist of deposits held with banks, money market funds, or other highly liquid investments that may at times exceed federally insured limits. Cash equivalents are financial instruments that potentially subject the Company to concentrations of risk, to the extent of amounts recorded in the balance sheets. The Company performs evaluations of its cash equivalents and the relative credit standing of these financial institutions and limits the amount of credit

exposure with any one institution. Management believes that the Company is not exposed to significant credit risk due to the financial position of the depository institutions in which those deposits are held.

Restricted Cash

Restricted cash consists of collateral required for the Company's bank-issued credit cards with balances of $0.2 million and $0 as of December 31, 2023 and December 31, 2022, respectively.

Investments

The Company accounts for investments in equity securities without a readily determinable fair value at cost, minus impairment. If the Company identifies observable price changes in orderly transactions for an identical or a similar investment of the same issuer, the Company will measure the equity security at fair value as of the date that the observable transaction occurred in accordance with ASC Topic 321, *Investments-Equity Securities*. The Company accounts for impairment of investments in equity securities by reviewing these assets for impairment whenever events or changes in circumstances indicate that the fair value of the security is less than its carrying amount.

Property and Equipment, Net

Property and equipment are stated at cost. Assets acquired under capital leases are stated at the present value of future minimum lease payments. Depreciation is recognized on a straight-line basis over the estimated useful lives of the related assets as follows:

Property and Equipment	Estimated Useful Life (in years)
Computers and software	3
Laboratory equipment	5
Furniture, fixtures, and office equipment	8

Leasehold improvements are amortized on a straight-line basis over the shorter of the lease term or the useful life of the asset.

Leases

The Company determines if an arrangement is or contains a lease at inception. For leases with a term greater than one year, lease right-of-use assets and lease liabilities are recognized at the lease commencement date based on the present value of lease payments over the lease term. In determining the net present value of lease payments, the Company uses its incremental borrowing rate which represents an estimated rate of interest that the Company would have to pay to borrow equivalent funds on a collateralized basis at the lease commencement date. Leases are classified as finance or operating, with classification affecting the pattern and classification of expense recognition in the statement of operations.

Goodwill

Goodwill is an asset representing the future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognized. Goodwill is not amortized but instead is tested annually for impairment at the reporting unit level, or more frequently when events or changes in circumstances indicate that fair value of the reporting unit has been reduced to less than its carrying value. The Company may choose to perform a qualitative assessment to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount as a basis for determining whether it is necessary to perform a quantitative assessment.

If a quantitative assessment is deemed necessary, the Company compares the fair value of the reporting unit with its carrying amount, including goodwill. An impairment loss will be recognized if the reporting unit’s carrying amount exceeds its fair value, to the extent that it does not exceed the total carrying amount of goodwill. No impairment existed as of December 31, 2023 or December 31, 2022.

Impairment of Long-Lived Assets

The Company accounts for the impairment of long-lived assets, such as property and equipment, by reviewing these assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. If circumstances require a long-lived asset or asset group to be tested for possible impairment, the Company first compares undiscounted future cash flows expected to be generated by that asset or asset group to its carrying value. If the carrying value of the long-lived asset or asset group is not recoverable on an undiscounted-cash-flow basis, an impairment is recognized to the extent that the carrying value exceeds its fair value. The Company recorded impairment of $0.1 million and $0.5 million during the years ended December 31, 2023 and December 31, 2022, respectively.

Fair Value of Financial Instruments

The Company's financial assets and liabilities are carried at fair value or at amounts that, because of their short-term nature, approximate current fair value, with the exception of its Convertible Notes, which are carried at amortized cost. The carrying value of the Company's accounts receivable, accounts payable, and accrued expenses and other current liabilities are considered to be representative of their respective fair values because of their short-term nature (see Note 6).

Embedded Derivatives Related to Convertible Notes

In December 2023, the Company issued the 2028 Convertible Notes with embedded derivatives that are required to be bifurcated from the host contract and remeasured to fair value at each balance sheet date. Any resulting gain or loss related to the change in the fair value of the embedded derivatives are recorded to other income, net in the consolidated statements of operations.

Common Stock Warrant Liabilities

The Company accounts for common stock warrants issued as freestanding instruments in accordance with applicable accounting guidance as either liabilities or as equity instruments depending on the specific terms of the warrant agreements. Warrants classified as liabilities are remeasured each period until settled or until classified as equity. Any resulting gain or loss related to the changes in the fair value of the warrant liabilities are recorded to gain (loss) on warrant liabilities in the consolidated statements of operations. Changes in the Company's inputs and assumptions, such as the Company's stock price and volatility of common stock, could result in material changes in the valuation in future periods.

Revenue Recognition

Revenue is recognized in accordance with the Financial Accounting Standards Board ("FASB") ASC Topic 606, Revenue from Contracts with Customers ("ASC 606"). In accordance with ASC 606, the Company follows a five-step process to recognize revenues: 1) identify the contract with the customer, 2) identify the performance obligations, 3) determine the transaction price, 4) allocate the transaction price to the performance obligations and 5) recognize revenues when the performance obligations are satisfied.

Revenue was primarily derived from providing molecular testing products, which were reimbursed through arrangements with third-party payors, laboratory distribution partners, and amounts from individual patients. Third-party payors include commercial payors, such as health insurance companies, health maintenance organizations and government health benefit programs, such as Medicare and Medicaid. The Company's contracts generally contained a single performance obligation, which was the delivery of the test results, and the Company satisfied its performance obligation at a point in time upon the delivery of the results, which then triggered the billing for the product. The amount of revenue recognized reflects the amount of consideration the Company expected to be entitled to ("transaction price") and considered the effects of variable consideration. Revenue was recognized when control of the promised product was transferred to customers, in an amount that reflected the consideration the Company expected to be entitled to in exchange for those products.

Repairs and Maintenance

The Company incurs maintenance costs on its major equipment. Repair and maintenance costs are expensed as incurred.

Research and Development

Research and development expenses consist primarily of costs associated with performing research and development activities to develop new products. Research and development expenses also consist of personnel expenses, including salaries, bonuses, stock-based compensation expense, and benefits, and allocated overhead costs. Research and development expenses are expensed as incurred.

Selling, General and Administrative

Selling, general and administrative expenses consist primarily of personnel costs, including salaries, bonuses, stock-based compensation expense, and benefits, for the Company's finance and accounting, legal, human resources, and other administrative teams. Additionally, these expenses include costs for communication, conferences, and professional fees of audit, legal, and recruiting services. Selling, general and administrative expenses are expensed as incurred.

Stock-Based Compensation

Stock-based compensation related to stock options, RSUs and the 2020 Employee Stock Purchase Plan ("ESPP") awards granted to the Company's employees is measured at the grant date based on the fair value of the award. The fair value is recognized as expense over the requisite service period, which is generally the vesting period of the respective awards. Compensation related to service-based awards is recognized starting on the grant date on a straight-line basis over the vesting period, which is typically four

years. For the ESPP, the requisite service period is generally the period of time from the offering date to the purchase date. In addition, the Company grants stock option awards that vest upon achievement of certain performance criteria ("Performance Awards"). The fair value is recognized as expense over the requisite service period when the Company has concluded that achieving the performance criteria is probable. The probability of achieving the performance criteria is assessed each reporting period. The Company accounts for the forfeitures in the period in which they occur. The fair value of RSUs is estimated based on the closing price of the Company's common stock on the date of the grant.

The fair value of stock options, ESPP awards and Performance Awards is estimated using the Black-Scholes option-pricing model and is affected by the Company's assumptions regarding a number of complex and subjective variables. These variables include, but are not limited to, the fair value of the common stock at the date of grant, the expected term of the awards, the expected stock price volatility over the term of the awards, risk-free interest rate, and dividend rate. The Company's inputs and assumptions with respect to these variables are as follows:

Fair Value of Common Stock—Prior to the IPO, the Company's common stock was not publicly traded, therefore the Company estimated the fair value of its common stock. Following the initial public offering of the Company's common stock (the "IPO"), the fair value of the Company's common stock for awards with service-based vesting is the closing price of its common stock on the date of grant or other relevant determination date.

Expected Term—The expected term represents the period that the stock-based awards are expected to be outstanding. The Company determines the expected term using the simplified method. The simplified method deems the term to be the average of the time-to-vesting and the contractual life of the options. For stock options granted to non-employees, the expected term equals the remaining contractual term of the option from the vesting date. For the ESPP, the expected term is the period of time from the offering date to the purchase date.

Expected Volatility—Given the limited period of time the Company's stock has been traded in an active market, the expected volatility is estimated by taking the average historical volatility for industry peers, consisting of several public companies in the Company's industry that are similar in size, stage, or financial leverage, over a period of time commensurate with the expected term of the awards.

Risk-Free Interest Rate—The risk-free interest rate is calculated using the average of the published interest rates of U.S. Treasury zero-coupon issues with maturities that are commensurate with the expected term.

Dividend Rate—The dividend yield assumption is zero, as the Company has no plans to pay dividends.

Net Loss Per Share

Basic net loss per share is computed by dividing the net loss by the weighted average number of shares of common stock outstanding during the period. Diluted net loss per share is computed by dividing the net loss by the weighted average number of shares of common stock and potentially dilutive securities outstanding for the period. As the Company has reported net losses for all periods presented, all potentially dilutive securities are antidilutive and, accordingly, basic net loss per share equals diluted net loss per share.

Income Taxes

The Company accounts for income taxes under the asset-and-liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax basis and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

The Company recognizes the effect of income tax positions only if those positions are more likely than not of being sustained. Recognized income tax positions are measured at the largest amount that is greater than 50% likely of being realized. Changes in recognition or measurement are recognized in the period in which the change in judgment occurs. Valuation allowances are established, when necessary, to reduce deferred tax assets to the amount expected to be realized.

Comprehensive Loss

The Company did not have any other comprehensive income or loss for any of the periods presented, and therefore comprehensive loss was the same as the Company's net loss.

Emerging Growth Company Status

The Company is an emerging growth company ("EGC"), as defined in the Jumpstart Our Business Startups Act of 2012 ("JOBS Act"). Under the JOBS Act, EGCs can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act until such time as those standards apply to private companies. The Company has elected to use this extended transition period for complying with new or revised accounting standards that have different effective dates for public and private companies until the earlier of the date that it (i) is no longer an emerging growth company or (ii) affirmatively and irrevocably opts out of the extended transition period provided in the JOBS Act. As a result, these consolidated financial statements may not be comparable to companies that comply with the new or revised accounting pronouncements as of public company effective dates.

Recent Accounting Pronouncements Adopted

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments—Credit Losses*, which requires the measurement of expected credit losses for financial instruments carried at amortized cost, such as accounts receivable, held at the reporting date based on historical experience, current conditions and reasonable forecasts. The main objective of this standard is to provide financial statement users with more decision-useful information about the expected credit losses on financial instruments and other commitments to extend credit held by a reporting entity at each reporting date. In November 2018, the FASB issued ASU No. 2018-19, *Codification Improvements to Topic 326, Financing Instruments–Credit Losses*, which included an amendment of the effective date. The Company adopted this standard on January 1, 2023, and it did not have a material impact on the consolidated financial statements.

Recent Accounting Pronouncements Not Yet Adopted

In August 2020, the FASB issued ASU No. 2020-06*, Debt—Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging-Contracts in Entity's Own Equity (Subtopic 815-40)-Accounting for Convertible Instruments and Contracts in an Entity's Own Equity*, which simplifies the accounting for convertible instruments, amends the guidance on derivative scope exceptions for contracts in an entity's own equity, and modifies the guidance on diluted earnings per share calculations as a result of these changes. The Company adopted this standard on January 1, 2024, and it did not have a material impact on the consolidated financial statements.

In December 2023, the FASB issued ASU No. 2023-09*, Improvements to Income Tax Disclosures*, which introduces new and enhanced income tax disclosure requirements. The standard is effective for the Company for annual reporting periods beginning after December 15, 2025. The Company is currently evaluating the impact the adoption of this standard may have on its consolidated financial statements and related disclosures.

Note 3. Strategic Transformation

Assets Held for Sale and Discontinued Operations

In June 2021, the Company announced its Strategic Transformation to reallocate resources to research and development to better position the business for future growth. The plan included the closure of the Company's genetics laboratory in Ann Arbor, Michigan and the divestiture of Avero. This plan represented a strategic business shift having a major effect on the Company's operations and financial results. The Company classified the results of its Laboratory Operations as discontinued operations in its consolidated statements of operations and consolidated statements of cash flows. Additionally, the remaining assets are reported as assets held for sale in the Company's consolidated balance sheets as of December 31, 2022 and there are no remaining assets as of December 31, 2023.

The following table presents the results of discontinued operations of the Laboratory Operations for the years ended December 31, 2023 and December 31, 2022 (in thousands):

	Years Ended December 31,	
	2023	2022
Revenues [1]	$ 1,219	$ 11,848
Operating expenses:		
Selling, general and administrative [2]	1,000	1,175
Total operating expenses	1,000	1,175
Net income from discontinued operations	$ 219	$ 10,673

(1) Refer to Note 9 for further discussion regarding the reversal of a previously established accrual related to a third-party claim of recoupment.
(2) Refer to Note 9 for further discussion regarding the accrual of amounts related to the IPO litigation.

The following table presents the carrying amount of the remaining assets held for sale related to the Laboratory Operations as of December 31, 2022 (in thousands):

	December 31, 2022
Current assets of disposal group held for sale	
Property and equipment, net	2,603
Total current assets of disposal group held for sale	$ 2,603

In October 2023, the Company entered into a purchase and sale agreement to sell the building located in Ann Arbor, Michigan included in current assets held for sale. The transaction closed in October 2023 and the Company received gross proceeds of $2.8 million, incurred closing expenses of $0.2 million. As of December 31, 2023 assets held for sale was zero.

Investment in Enumera Molecular, Inc.

In May 2022, the Company completed the divesture of its single-molecule detection platform. Under the terms of the agreements, the Company contributed intellectual property and fixed assets related to the single-molecule detection platform to a newly formed entity, Enumera Molecular, Inc. ("Enumera"), which intends to develop and commercialize the platform. As of the transaction date, the Company received 25% minority ownership, on a fully diluted basis, of 6,000,000 Series A-1 preferred shares with an estimated value of $6.0 million in exchange for the assets. The Company concluded, based on a technical evaluation of the facts, that Enumera is not a variable interest entity. The Company also evaluated the characteristics of the investment and determined that the preferred stock is not in-substance common stock that would require equity method accounting. The Company concluded the appropriate accounting treatment for the investment in Enumera to be that of an equity security with no readily determinable fair value and has recorded the investment at cost, less impairment, adjusted for subsequent observable price changes. The investment is included in other assets in the Company's consolidated balance sheets. The Company recognized a gain of $5.7 million on the investment during the year ended December 31, 2022 included in other (expense) income, net on the consolidated statements of operations. The Company determined the fair value was less than carrying value as of December 31, 2023 based on their negative cash flows from operations and for the year ended December 31, 2023 recorded a $3.0 million impairment loss on its investment, included in other (expense) income, net on the consolidated statements of operations. In March 2024, the Company entered into a stock purchase agreement, pursuant to which it sold its Series A-1 preferred shares for $3.0 million.

Licensing Agreements

In November 2022, the Company entered into a license agreement with Northwest Pathology, doing business as Avero Diagnostics ("Northwest"), pursuant to which the Company licensed its Preecludia rule-out test for preeclampsia to Northwest for commercial development (the "Northwest License Agreement"). Under the terms of the Northwest License Agreement, Northwest received the rights to assets and intellectual property related to the Preecludia test and the Company will receive commercial milestone payments and royalties on net sales.

In June 2023, the Company entered into a purchase and license agreement with a diagnostics company pursuant to which the Company sold certain assets and licensed intellectual property related to preeclampsia for research and development (the "Preeclampsia Agreement"). Under the terms of the Preeclampsia Agreement, the Company received a one-time payment for the sale of assets, including the sale of rights to certain antibody sequences, during the year ended December 31, 2023 and recorded $1.5 million of other income.

In May 2023, the Company entered into a professional services agreement with an affiliate of Enumera, a related party. Pursuant to the agreement, the affiliate will assist in selling legacy assets. The Company incurred $0.4 million in other expenses in connection with the agreement.

Note 4. Revenues

The Company's current revenue is related to license and collaboration agreements. Revenues historically were derived from contracts with healthcare insurers, government payors, laboratory partners and patients related to tests provided to patients. The Company evaluated its contracts and identified a single performance obligation, the delivery of a test result. The Company satisfied its performance obligation at a point in time upon the delivery of the test result, at which point the Company billed for its products. The amount of revenue recognized reflected the transaction price and considered the effects of variable consideration. All of the historical test revenue is part of the Company's Laboratory Operations and has been included in discontinued operations in the consolidated statements of operations.

The Company had established an accrual for refunds of payments previously made by healthcare insurers based on historical experience and executed settlement agreements with healthcare insurers. Any refunds were accounted for as reductions in revenues in the statement of operations as an element of variable consideration.

The Company periodically updated its estimate of the variable consideration recognized for previously delivered performance obligations. These updates resulted in an additional $2.0 million of revenue for the year ended December 31, 2022 and zero for the year ended December 31, 2023. These amounts included (i) adjustments for actual collections versus estimated variable consideration as of the beginning of the reporting period and (ii) cash collections and the related recognition of revenue in the current period for tests delivered in prior periods due to the release of the constraint on variable consideration, offset by (iii) reductions in revenue for the accrual for reimbursement claims and settlements described in Note 9.

Note 5. Balance Sheet Components

Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consisted of the following (in thousands):

	December 31,	
	2023	2022
Prepaid expenses	$ 2,443	$ 3,634
Other current assets	587	565
Total	$ 3,030	$ 4,199

Property and Equipment, Net

Property and equipment, net consisted of the following (in thousands):

	December 31,	
	2023	2022
Computers and software	$ 1,193	$ 2,715
Building and leasehold improvements	803	750
Laboratory equipment	423	958
Furniture, fixtures, and office equipment	799	1,138
Construction in progress	45	92
Total property and equipment	3,263	5,653
Less accumulated depreciation and amortization	(2,107)	(3,999)
Property and equipment, net	$ 1,156	$ 1,654

Depreciation expense included in continuing operations was $0.6 million and $0.9 million for the years ended December 31, 2023 and 2022, respectively.

Other Assets

Other assets consisted of the following (in thousands):

	December 31,	
	2023	2022
Investment in Enumera	$ 3,000	$ 6,000
Other	302	201
Total	$ 3,302	$ 6,201

Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consisted of the following (in thousands):

	December 31,	
	2023	2022
Accrual for reimbursement claims and legal settlements, current [1]	$ 6,337	$ 8,372
Commissions and bonuses	2,469	1,433
Vacation and payroll benefits	1,367	1,724
Accrued professional services	2,914	307
Accrued interest	173	890
Lease liabilities, current	896	893
Insurance financing	401	445
Contract liabilities	542	47
Other [2]	2,220	2,050
Total	$ 17,319	$ 16,161

(1) Revenues related to Laboratory Operations have all been discontinued; amounts related to the revenue reserve generated from the Laboratory Operations remain on the balance sheet.
(2) Included in this amount are contracts that the Company is responsible for that were expensed in discontinued operations in 2021.

Other Long-term Liabilities

Other long-term liabilities consisted of the following (in thousands):

	December 31,	
	2023	2022
Lease liabilities, net of current portion	818	601
Other [1]	2,211	4,095
Total	$ 3,029	$ 4,696

(1) Included in this amount are contracts that the Company is responsible for that were expensed in discontinued operations in 2021.

Note 6. Fair Value Measurements

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability (an exit price) in an orderly transaction between market participants at the measurement date. The authoritative guidance establishes a three-level valuation hierarchy that prioritizes the inputs to valuation techniques used to measure fair value based upon whether such inputs are observable or unobservable. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect market assumptions made by the reporting entity. This hierarchy requires the Company to use observable market data, when available, and to minimize the use of unobservable inputs when determining fair value. The three-level hierarchy for the inputs to valuation techniques is summarized as follows:

Level 1 - Quoted prices in active markets for identical assets and liabilities that the Company has the ability to access.

Level 2 - Observable market-based inputs or unobservable inputs that are corroborated by market data, such as quoted prices, interest rates, and yield curves.

Level 3 - Inputs that are unobservable data points that are not corroborated by market data.

There were no significant transfers between these fair value measurement classifications during the years ended December 31, 2023 and 2022.

The following table presents information about the Company's assets and liabilities that are measured at fair value on a recurring basis and indicates the fair value hierarchy of the valuation techniques utilized to determine such fair value (in thousands):

	Level 1	Level 2	Level 3
December 31, 2023			
Derivative liabilities	$ —	$ —	$ 22,899
Warrant liabilities	$ —	$ —	$ 40,834
December 31, 2022			
Money market funds [1]	$ 5	$ —	$ —
Warrant liabilities	$ —	$ —	$ 3,538

(1) Included in cash, cash equivalents and restricted cash in the accompanying consolidated balance sheets.

The Company issued 2028 Convertible Notes (see Note 7) that contain conversion features that are required to be bifurcated and recorded as embedded derivative liabilities in the consolidated balance sheet. The Company utilized a binomial pricing model to determine the fair value of the conversion features, which utilizes significant unobservable inputs. The fair value of the embedded derivatives as of December 31, 2023 was estimated using a binomial pricing model with the following inputs and assumptions:

	As of December 31, 2023
Risk-free interest rate	3.8% - 4.3%
Expected volatility	84.3% - 95.7%
Stock price	$1.35
Discount Rate	28.7% - 28.9%

The Company's Level 3 liabilities consist of the warrant liabilities resulting from equity financings (see Note 10) and the Convertible Note exchanges (see Note 7). The Company uses the Black-Scholes Model to value the Level 3 warrant liabilities at inception and on subsequent valuation dates. This model incorporates transaction details such as the Company's stock price, contractual terms, maturity, risk free rates, and volatility. The significant unobservable input for the warrant liabilities includes volatility. Given the limited period of time the Company's stock has been traded in an active market, the expected volatility is estimated by taking the average historical price volatility for industry peers, consisting of several public companies in the Company's industry that are similar in size, stage, or financial leverage, over a period of time commensurate to the expected term of the warrants. At December 31, 2023 and 2022, the fair value of the warrant liabilities were estimated using the Black-Scholes Model with the following inputs and assumptions:

	As of December 31,	
	2023	2022
Risk-free interest rate	3.8% - 4.1%	4.0%
Expected volatility	95.6% - 101.8%	106.2% - 107.1%
Stock price	$1.35	$3.30
Expected life (years)	2.5 - 5.0	3.6 - 5.4

A summary of the changes in the Level 3 classified liabilities is presented below (in thousands):

	Warrant Liabilities	Derivative Liabilities
Balance at December 31, 2021	$ 18,731	$ —
Recognition of new warrant liabilities	2,990	—
Change in fair value	(18,183)	—
Balance at December 31, 2022	$ 3,538	$ —
Recognition of new warrant liabilities	63,393	—
Recognition of derivative liabilities	—	18,984
Change in fair value	(26,097)	3,915
Balance at December 31, 2023	$ 40,834	$ 22,899

Note 7. Convertible Notes

The following table summarizes significant terms of the Company's Convertible Notes at December 31, 2023 (in thousands):

	December 31, 2023				
	Face Value	Carrying Value	Fair Value [1]	Stated Interest Rate	Effective Interest Rate
2028 Convertible Notes	$ 23,500	$ 14,591	$ 14,846	11-13%	48.9%
Related Party 2028 Convertible Notes	$ 17,383	$ 21,155	$ 10,982	11-13%	(22.0)%
2025 Convertible Notes	$ 10,225	$ 9,966	$ 5,984	7.25%	8.7%

(1) To estimate the fair value of the 2028 Convertible Notes, the Company used a binomial pricing model. Including the derivative liabilities of $22.9 million, the 2028 Convertible Notes fair value using the with method is $48.7 million. To estimate the fair value of the 2025 Convertible Notes, the Company used unadjusted quoted prices in the active market obtained from third-party pricing services.

The following table summarizes significant terms of the Company's Convertible Notes at December 31, 2022 (in thousands):

	December 31, 2022				
	Face Value	Carrying Value	Fair Value [2]	Stated Interest Rate	Effective Interest Rate
2025 Convertible Notes	$ 132,725	$ 127,811	$ 71,790	7.25%	8.7%

(2) The Company used unadjusted quoted prices in the active market obtained from third-party pricing services to determine the fair value of the 2025 Convertible Notes.

The carrying value of the Convertible Notes does not approximate their fair values because the carrying values reflect the balance of unamortized discount related to the derivative liabilities associated with the value of the conversion features assessed at inception. The Company amortizes the debt discount using the effective interest method over the term of the Convertible Notes. As of December 31, 2023 and 2022, the unamortized debt discount on the 2025 Convertible Notes was $0.3 million and $4.9 million, respectively, and the amortization of the debt discount was $1.3 million and $1.4 million, respectively, and is included in interest expense, net in the consolidated statements of operations. As of December 31, 2023, the unamortized debt discount on the 2028 Convertible Notes was $19.0 million and the amortization of the debt discount was $0.3 million and is included in interest expense, net in the consolidated statements of operations.

2025 Convertible Notes

In December 2020, the Company issued a total of $168.5 million principal amount of 2025 Convertible Notes in a private offering of the Convertible Notes pursuant to Rule 144A under the Securities Act of 1933, as amended (the "Securities Act"). The 2025 Convertible Notes were issued pursuant to, and are governed by, an indenture, dated as of December 7, 2020, by and between the Company and The Bank of New York Mellon Trust Company, N.A., as trustee ("Indenture"). The 2025 Convertible Notes are due on December 1, 2025, unless earlier repurchased, redeemed or converted, and accrue interest at a rate per annum equal to 7.25% payable semi-annually in arrears on June 1 and December 1 of each year, with the initial payment on June 1, 2021. During the years ended December 31, 2023 and 2022, the Company recognized interest expense on the 2025 Convertible Notes of $8.4 million and $9.6 million, respectively.

The 2025 Convertible Notes are the Company's senior, unsecured obligations and are (i) equal in right of payment with the Company's existing and future senior, unsecured indebtedness; (ii) senior in right of payment to the Company's existing and future indebtedness that is expressly subordinated to the 2025 Convertible Notes; (iii) effectively subordinated to the Company's existing and future secured indebtedness, to the extent of the value of the collateral securing that indebtedness; and (iv) structurally subordinated to all existing and future indebtedness and other liabilities, including trade payables, and (to the extent the Company is not a holder thereof) preferred equity, if any, of the Company's subsidiaries.

At any time, noteholders may convert their 2025 Convertible Notes at their option into shares of the Company's common stock, together, if applicable, with cash in lieu of any fractional share, at the then-applicable conversion rate. The initial conversion rate is 11.1204 shares of common stock per $1,000 principal amount of 2025 Convertible Notes, which represents an initial conversion price of approximately $89.92 per share of common stock. Noteholders that converted their 2025 Convertible Notes before December 1, 2022 were, in certain circumstances, entitled to an additional cash payment representing the present value of any remaining interest payments on the 2025 Convertible Notes through December 1, 2022. The conversion rate and conversion price are subject to customary adjustments upon the occurrence of certain dilutive events. In addition, if certain corporate events that constitute a

“Make-Whole Fundamental Change” (as defined in the Indenture) occur, then the conversion rate will, in certain circumstances, be increased for a specified period of time.

The 2025 Convertible Notes are redeemable, in whole and not in part, at the Company’s option at any time on or after December 1, 2023, at a cash redemption price equal to the principal amount of the 2025 Convertible Notes to be redeemed, plus accrued and unpaid interest, if any, to, but excluding, the redemption date, but only if the last reported sale price per share of the Company’s common stock exceeds 130% of the conversion price on (i) each of at least 20 trading days, whether or not consecutive, during the 30 consecutive trading days ending on, and including, the trading day immediately before the date the Company sends the related redemption notice; and (ii) the trading day immediately before the date the Company sends such notice. In addition, calling the 2025 Convertible Notes will constitute a Make-Whole Fundamental Change, which will result in an increase to the conversion rate in certain circumstances for a specified period of time.

The 2025 Convertible Notes have customary provisions relating to the occurrence of “Events of Default” (as defined in the Indenture). As of December 31, 2023 and December 31, 2022, the Company was in compliance with all such covenants.

The 2025 Convertible Notes had a conversion option which was required to be bifurcated upon issuance and periodically remeasured to fair value separately as an embedded derivative. The conversion feature was bifurcated and recorded separately as an embedded derivative remeasured at fair value each reporting period with changes in fair value recorded in the consolidated statement of operations. As of December 31, 2022, the conversion option expired and there was no longer a derivative liability.

Note Exchanges

In September 2023, certain related-party holders of 2025 Convertible Notes exchanged an aggregate of $50.0 million principal amount for a combination of 9,235,281 shares of the Company's common stock, 7,399,226 pre-funded warrants at an exercise price of $0.001 per share and warrants to purchase up to 16,634,507 shares of common stock at an exercise price of $3.01 per share. The warrants are exercisable on or after September 18, 2023 until September 18, 2026 and the pre-funded warrants have no expiration date. The pre-funded warrants and the warrants (together, the "September Warrants") are subject to certain exercise limitations, including a limitation on the ability to exercise if the holder’s beneficial ownership would exceed 49.9%. As the 2025 Convertible Notes were exchanged for an amount over the fair value of shares issuable under the original conversion terms, the Company recorded an inducement loss of $53.2 million, included in other (expense) income, net in the consolidated statements of operations. Pursuant to ASC 815, the Company deemed the September Warrants to be classified as a liability at fair value initially with subsequent changes in fair value recorded in earnings. The September Warrants were recorded at a fair value of $35.1 million determined using the Black-Scholes Model.

In December 2023, the Company entered into Exchange Agreements (the “Note Exchange Agreements”) with certain holders of 2025 Convertible Notes to exchange an aggregate of $72.5 million principal amount for a combination of (i) $23.9 million in principal amount of 2028 Convertible Notes (ii) 625,000 shares of the Company's common stock, (iii) warrants to purchase 5,039,236 shares of common stock (the “Exchange Warrants”), and (iv) accrued and unpaid interest on the 2025 Convertible Notes. The Company also entered into Note Purchase Agreements (the “Note Purchase Agreements”), with certain investors (the "Purchasers") to purchase $17.0 million in principal amount of additional 2028 Convertible Notes from the Company for cash at par value. The Purchasers were granted warrants to purchase 5,084,613 shares of common stock (the “Additional Warrants”) and certain Purchasers were also granted warrants to purchase 7,352,941 shares of common stock (the “Commitment Warrants”). In connection with the Note Exchange Agreements and the Note Purchase Agreements, the Company has agreed to allow certain of the parties to designate one board observer.

2028 Convertible Notes

The 2028 Convertible Notes were issued pursuant to, and are governed by, an indenture (the “2028 Convertible Notes Indenture”), dated December 19, 2023, by and between the Company and GLAS Trust Company LLC, as trustee (the “Trustee”). The 2028 Convertible Notes will mature on the earlier of December 19, 2028 and the date that is 90 days prior to the maturity of the Convertible Notes solely to the extent there are Convertible Notes outstanding in a principal amount equal to or greater than $5.0 million as of such date, unless earlier repurchased, redeemed or converted. The Notes will accrue interest at a rate of 11.0% per annum in the case of cash payment and 13.0% in the case of blended payments or payments-in-kind, payable semi-annually in arrears on June 1 and December 1 of each year, with the initial payment on June 1, 2024. During the year ended December 31, 2023 the Company recognized interest expense on the 2028 Convertible Notes of $0.1 million.

The 2028 Convertible Notes are the Company’s senior secured obligations, and are secured by substantially all of the Company’s and its subsidiaries’ assets. The 2028 Convertible Notes are (i) senior in right of payment to the Company’s existing and

future senior, unsecured indebtedness to the extent of the value of the collateral; and (ii) senior in right of payment to the Company's existing and future indebtedness that is expressly subordinated to the 2028 Convertible Notes.

At any time, noteholders may convert their 2028 Convertible Notes at their option into shares of the Company's common stock, together, if applicable, with cash in lieu of any fractional share, at the then-applicable conversion rate. The initial conversion rate is 641.02564 shares of common stock per $1,000 principal amount of 2028 Convertible Notes, which represents an initial conversion price of approximately $1.56 per share of common stock. Noteholders that convert their 2028 Convertible Notes will be entitled to an additional premium payment representing the amount of certain of the remaining interest payments on the 2028 Convertible Notes as specified in the 2023 Indenture. The conversion rate and conversion price will be subject to customary adjustments upon the occurrence of certain events.

The 2028 Convertible Notes are redeemable, in whole and not in part, at the Company's option at any time on or after December 19, 2024, and in some circumstances prior to that date, at a cash redemption price equal to the principal amount of the 2028 Convertible Notes to be redeemed, plus accrued and unpaid interest, if any, to, but excluding, the redemption date, but only if the last reported sale price per share of the Company's common stock exceeds 150% of the conversion price on (i) each of at least 20 trading days, whether or not consecutive, during the 30 consecutive trading days ending on, and including, the trading day immediately before the date the Company sends the related redemption notice; and (ii) the trading day immediately before the date the Company sends such notice.

If certain corporate events that constitute a "Fundamental Change" (as defined in the Indenture) occur, then noteholders may require the Company to repurchase their Notes at a cash repurchase price equal to the principal amount of the 2028 Convertible Notes to be repurchased, plus accrued and unpaid interest, if any, to, but excluding, the fundamental change repurchase date. The definition of Fundamental Change includes certain business combination transactions involving the Company and certain de-listing events with respect to the Company's common stock.

The 2028 Indenture contains covenants restricting the Company's ability to incur indebtedness, incur liens, make restricted payments, make asset sales and engage in transactions with affiliates, subject to certain baskets. The 2028 Convertible Notes Indenture requires the Company to maintain minimum liquidity of $4.0 million and to add future assets to the collateral under the Security Agreement (as defined below) and to add future subsidiaries as guarantors under the Security Agreement. The 2028 Convertible Notes have customary provision relating to the occurrence of "Events of Default" (as defined in the Indenture). As of December 31, 2023, the Company was in compliance with all such covenants.

The 2028 Convertible Notes have several conversion features which are required to be bifurcated upon issuance and periodically remeasured to fair value separately as an embedded derivative. The conversion features were bifurcated and recorded separately as an embedded derivative remeasured at fair value each reporting period with changes in fair value recorded in other (expense) income, net in the consolidated statement of operations.

The note exchange with one holder of 2025 Convertible Notes constitutes a troubled debt restructuring ("TDR") under ASC 470, because the Company is experiencing financial difficulty and a concession has been granted by the holder. As the holder is a related party, the Company recorded the restructuring gain as a capital contribution resulting in $25.5 million of restructuring gain recorded within additional paid-in-capital as of December 31, 2023. Following the TDR guidance under ASC 470, future interest payments of approximately $11.7 million were also included in the carrying value of the restructured senior secured convertible notes.

The note exchange with the other holders of 2025 Convertible Notes is considered a debt extinguishment under ASC 470. As a result, the Company recorded a loss on debt extinguishment of $6.4 million, which is the difference between the fair value of the 2028 Convertible Notes combined with the fair value of the warrants, derivative liabilities and common stock and the net carrying value of the 2025 Convertible Notes, which included $0.5 million of unamortized debt discount and third-party fees of $0.3 million.

The Exchange Warrants have an exercise price of $5.50 per share, the Commitment Warrants have an exercise price of $1.36 per share and are exercisable at any time on or after June 19, 2024 and the Additional Warrants have an exercise price of $5.00 per share. Each of the Exchange Warrants, the Commitment Warrants and the Additional Warrants (together the "December Warrants") are subject to certain exercise limitations, including a limitation on the ability to exercise if the holder's beneficial ownership of common stock would exceed specified levels. Pursuant to ASC 815, the Company deemed the December Warrants to be classified as a liability at fair value initially with subsequent changes in fair value recorded in earnings.

Note 8. Related Party Transactions

In November 2022, the Company entered into a securities purchase agreement with affiliates of Athyrium Capital Management, LP ("Athyrium") relating to the offering and sale of an aggregate of 500,250 shares of common stock and accompanying warrants to purchase 500,250 shares of common stock, at a combined purchase price of $7.50 per share and accompanying warrant in a registered direct offering. The warrants have an exercise price of $8.22 per share and became exercisable six months following the date of issuance and will expire five years following the initial exercise date. The Company received approximately $3.8 million in gross proceeds from the offering as an in-kind payment. The in-kind payment was in the form of a waiver of the Company's cash interest payment obligation of approximately $3.8 million due on the 2025 Convertible Notes for the payment date occurring on December 1, 2022. Additionally, the Company agreed with Athyrium to amend outstanding warrants previously issued in 2021 to purchase up to 323,886 shares of common stock with an exercise price of $71.00 per share. The warrants have an amended exercise price of $8.22 per share, will become exercisable on May 9, 2023 and will expire five years following the initial exercise date.

As of December 31, 2022, Athyrium held 1,694,484 shares, or 19.0% of the Company's common stock outstanding and warrants to purchase up to 824,136 shares of common stock at an exercise price of $8.22. Athyrium also held $103.5 million aggregate principal amount of 2025 Convertible Notes as of December 31, 2022. As of December 31, 2022 the accrued interest expense related to the 2025 Convertible Notes held by Athyrium was $0.6 million.

In September 2023, Athyrium exchanged an aggregate of $50.0 million principal amount of 2025 Convertible Notes for a combination of 9,235,281 shares of the Company's common stock, 7,399,226 pre-funded warrants and warrants to purchase up to 16,634,507 shares of common stock at an exercise price of $3.01 (see Note 7).

In December 2023, Athyrium exchanged an aggregate of $53.5 million principal amount of 2025 Convertible Notes for $10.4 million of 2028 Convertible Notes and warrants to purchase up to 5,039,236 shares of common stock at an exercise price of $5.50 per share. Additionally, Athyrium purchased $7.0 million of 2028 Convertible Notes with an in-kind payment in the form of a waiver of the Company's cash interest payment obligation on the Convertible Notes and was granted warrants to purchase up to 2,085,372 shares of common stock at an exercise price of $5.00 per share (see Note 7).

As of December 31, 2023 Athyrium held $17.4 million aggregate principal amount of 2028 Convertible Notes. Athyrium also held 10,929,763 shares, or 39.3%, of the Company's common stock outstanding, 7,399,226 pre-funded warrants and warrants to purchase up to 24,583,231 shares of common stock at exercise prices ranging from of $3.01 to $8.22 as of December 31, 2023.

In November 2022, the Company entered into a securities purchase agreement with an institutional investor relating to the offering and sale of an aggregate of 800,000 shares of common stock and accompanying warrants to purchase 800,000 shares of common stock, at a combined purchase price of $7.50 per share and accompanying warrant in a registered direct offering (see Note 10). Following this transaction, the institutional investor became a related party due to greater than 5% ownership. On January 12, 2023, the Company issued warrants to purchase 90,000 shares of common stock to the institutional investor in exchange for the investor's agreement to waive the lockup provisions contained in the November 2022 Offering (as defined below) securities purchase agreement. As of March 31, 2023 this institutional investor held less than 5% of the Company's outstanding common stock and is no longer considered a related party.

In June 2023, the Company entered into a securities purchase agreement with certain institutional and accredited investors relating to the offering and sale of 1,509,434 shares of common stock in a registered direct offering at an offering price of $5.30 per share. In addition, in a concurrent private placement, the Company issued unregistered warrants to purchase 3,018,868 shares of common stock (see Note 10) to the same investors. Following this transaction, the institutional and accredited investors became related parties due to greater than 5% ownership. As of September 30, 2023 the institutional and accredited investors held less than 5% of the Company's outstanding common stock and are no longer considered related parties.

Note 9. Commitments and Contingencies

Operating Leases

The Company has entered into various non-cancelable operating lease agreements, primarily for office space, laboratory space, and equipment. In March 2023, the Company signed an amended lease agreement for certain office space in San Diego, California to decrease the office space and extend the term to June 2025. In August 2023, the Company signed a 36-month lease agreement for laboratory space in Dallas, Texas.

The components of lease expense were as follows (in thousands):

	Year Ended December 31,	
	2023	2022
Operating lease costs	$ 1,369	$ 1,531
Cash paid for operating leases	$ 1,281	$ 1,609

Supplemental weighted-average information related to operating leases is as follows:

	December 31,	
	2023	2022
Weighted-average remaining lease term (years)	2.2	2.3
Weighted-average discount rate	9.7%	7.8%

As of December 31, 2023, future lease payments under the non-cancelable operating leases were as follows (in thousands):

Year ending December 31,	Minimum Operating Lease Payments
2024	$ 1,022
2025	590
2026	264
2027	18
2028 and thereafter	—
Total minimum lease payments	1,894
Less: interest	(180)
Present value of lease liabilities	$ 1,714

Contingencies

The Company, in the ordinary course of its business, can be involved in lawsuits, threats of litigation, and audit and investigative demands from third parties. While management is unable to predict the exact outcome of such matters, it is management's current belief that any potential liabilities of Biora resulting from these contingencies, individually or in the aggregate, could have a material impact on the Company's financial position and results of operations.

The regulations governing government reimbursement programs (*e.g.*, Medicaid, Tricare, and Medicare) and commercial payor reimbursement programs are complex and may be subject to interpretation. As a former provider of services to patients covered under government and commercial payor programs, post payment review audits, and other forms of reviews and investigations are routine. The Company believes it complied in all material respects with the statutes, regulations, and other requirements applicable to its former laboratory operations.

Federal Investigations

In April 2018, the Company received a civil investigative demand from an Assistant U.S. Attorney ("AUSA") for the Southern District of New York and a Health Insurance Portability and Accountability Act subpoena issued by an AUSA for the Southern District of California ("SDCA") around legacy commercial practices. In May 2018, the Company received a subpoena from the State of New York Medicaid Fraud Control Unit.

On July 21, 2020, July 23, 2020 and October 1, 2020, the Company entered into agreements (the "Agreements") with certain governmental agencies and the 45 states participating in the settlement ("State AGs") to resolve, with respect to such agencies and State AGs, all of such agencies' and State AGs' outstanding civil, and, where applicable, federal criminal investigations described above. In November 2022, the Company entered into an agreement to extend the deadline for the Company's payment due on December 31, 2022 to July 15, 2023. The Company did not make any payments during the year ended December 31, 2022. In July 2023, the Company made payments of $1.7 million and entered into agreements to extend the deadline for the remaining payments to the following:

- approximately $2.8 million on or before January 1, 2024; and
- approximately $2.6 million on or before July 1, 2024.

The remaining amounts payable to the government will be subject to interest at a rate of 1.25% per annum, and any or all amounts may be paid earlier at the option of the Company. As of December 31, 2023, the Company's accrual consisted of $5.3 million in accrued expenses and other current liabilities. In January 2024, the Company paid $2.8 million.

Furthermore, the Company has agreed that, if during calendar years 2020 through 2023, and so long as amounts payable to the government remain unpaid, the Company receives any civil settlement, damages awards, or tax refunds, to the extent that the amounts exceed $5.0 million in a calendar year, it will pay 26% of the amount received in such civil settlement, damages award, or tax refunds as an accelerated payment of the scheduled amounts set forth above, up to a maximum total acceleration of $4.1 million. The Company did not receive any tax refunds during the years ended December 31, 2023 and 2022.

Corporate Integrity Agreement

In connection with the resolution of the investigated matters, and in exchange for the Office of Inspector General of the Department of Health and Human Services ("OIG") agreement not to exercise its authority to permissively exclude the Company from participating in federal healthcare programs, effective July 21, 2020, the Company entered into a five-year Corporate Integrity Agreement with the OIG. The Corporate Integrity Agreement requires, among other matters, that the Company maintain a Compliance Officer, a Compliance Committee, board review and oversight of certain federal healthcare compliance matters, compliance programs, and disclosure programs; provide management certifications and compliance training and education; engage an independent review organization to conduct claims and arrangements reviews; and implement a risk assessment and internal review process. In view of the Company's Strategic Transformation, including cessation of its Laboratory Operations and related billing for services, effective March 7, 2023 the OIG agreed to suspend the Company's obligations under the Corporate Integrity Agreement.

Colorado Recoupment

On July 21, 2021, the Company received a letter from the Colorado Department of Health Care Policy and Financing (the "Department"), informing the Company that, as a result of a post-payment review of Medicaid claims from October 2014 to June 2018, the Department is seeking recoupment for historical payments in an aggregate amount of approximately $5.7 million. In December 2021, the Company received additional correspondence informing them that the Department is seeking recoupment for an additional $3.3 million of historical payments from 2018. The historical payments for which the Department is seeking recoupment primarily relate to the Company's Preparent expanded carrier screening tests primarily on the basis that such tests were not medically necessary.

The Company disputed these claims of recoupment with the Department and filed administrative complaints with the State of Colorado Office of Administrative Courts. During the year ended December 31, 2022, the Company concluded a settlement agreement resolution of the matter that included a dismissal of the complaints and a full release of all the claims, except for approximately $11,000 in claims, which the Company refunded.

California Subpoena

On July 19, 2021, the Company received a subpoena from the California Attorney General's Office, Division of Public Rights (the "OAG"), requesting documents and information related to the Company's former genetic testing practices, the Company's former NIPT, particularly those with a nexus to California patients. The OAG alleged that the Company violated California Business and Professions Code sections 17200 et seq. and 17500 et seq., in a complaint filed September 12, 2023 in the Superior Court of the State of California (case no. 23CV008397) for injunctive and other relief. The Company and OAG settled the matter via a stipulated entry of Final Judgment and Permanent Injunction that was entered and ordered by the Court on September 25, 2023. Pursuant to the order, the Company paid civil penalties in the total amount of $0.2 million.

Payor Dispute

On November 16, 2020, the Company received a letter from Anthem, Inc. ("Anthem") informing the Company that Anthem is seeking recoupment for historical payments made by Anthem in an aggregate amount of approximately $27.4 million. The historical payments for which Anthem is seeking recoupment are claimed to relate primarily to discontinued legacy billing practices for the Company's former NIPT and microdeletion tests and secondarily to discontinued legacy billing practices involving the implementation of a new Current Procedure Terminology code for reimbursement for the Company's former Preparent expanded carrier screening tests. Management disputes this claim of recoupment with Anthem in full, with offsets for amounts owed by Anthem to the Company. Management had previously established an accrual for the estimated probable loss for this matter. During the year ended December 31, 2022, the Company reversed this accrual for a portion of the matter in view of applicable statute of limitations and has reflected this change in revenue within discontinued operations. During the year ended December 31, 2023, the Company

reversed the remaining accrual for this matter in view of applicable statute of limitations and has reflected this change in revenue within discontinued operations.

Payor Recoveries

As noted above, the regulations governing government reimbursement programs (*e.g.*, Medicaid, Tricare, and Medicare) and commercial payor reimbursement programs are complex and may be subject to interpretation. As a former provider of services to patients covered under government reimbursement and commercial payor programs, the Company is routinely subject to post-payment review audits and other forms of reviews and investigations. For example, the Company rejected several managed Medicaid payor recoupment requests that it received in 2022 aggregating to $1.1 million. If a third-party payor successfully challenges that a payment to the Company for prior testing was in breach of contract or otherwise contrary to policy or law, they may recoup such payment. The Company may also decide to negotiate and settle with a third-party payor in order to resolve an allegation of overpayment. In the past, the Company has negotiated and settled these types of claims with third-party payors. The Company may be required to resolve further disputes in the future. While management is unable to predict the exact outcome of any such claims, it is management's current belief that any potential liabilities resulting from these contingencies related to payors and the Company's ceased laboratory operations, individually or in the aggregate, should not have a material impact on the Company's financial position and results of operations.

Texas OIG Inquiry

On October 16, 2019, the Company received an inquiry from the Texas Health & Human Services Commission Office of Inspector General ("TX OIG") alleging that the Company did not hold the required CLIA Laboratory Certificate of Accreditation to perform, bill for, or be reimbursed by the Texas Medicaid Program for certain tests performed by us from January 1, 2015 through December 31, 2018. During the year ended December 31, 2022, the Company fully resolved and settled the matter for an immaterial payment by the Company in exchange for a release of all claims.

Ravgen Lawsuit

On December 22, 2020, Ravgen, Inc. ("Ravgen") filed suit in the District of Delaware (D. Del. Civil Action No. 1:20-cv-1734) asserting the Company's infringement of two Ravgen patents based on the Company's former NIPT testing business. The complaint seeks monetary damages and injunctive relief. The Company responded to the complaint on March 23, 2021. Management believes the claims in Ravgen's complaint are without merit, and the Company is vigorously defending against them. The case is currently scheduled for trial in October 2024. Given the uncertainty of litigation and the legal standards that must be met for, among other things, success on the merits, the Company is unable to predict the ultimate outcome of this matter, and therefore cannot estimate the reasonably possible loss or range of loss, if any, that may result from this action.

IPO Litigation

On June 23, 2020, the Company closed its IPO. Lawsuits were filed on August 28, 2020 and September 11, 2020 against the Company, certain of its executive officers and directors, and the underwriters of the IPO. On December 3, 2020, the U.S. District Court for the Southern District of California consolidated the two actions, appointed Lin Shen, Lingjun Lin and Fusheng Lin to serve as Lead Plaintiffs, and approved Glancy Prongay & Murray LLP to be Lead Plaintiffs' Counsel. Lead Plaintiffs filed their first amended complaint on February 4, 2021. Together with the underwriters of the IPO, the Company moved to dismiss the first amended complaint. On September 1, 2021, the court granted the Company's motion to dismiss, dismissing Lead Plaintiffs' claims without prejudice. On September 22, 2021, Lead Plaintiffs filed their second amended complaint. Together with the underwriters of the IPO, the Company moved to dismiss the second amended complaint on November 15, 2021. On January 13, 2023, the court again granted our motion to dismiss, dismissing Lead Plaintiffs' claims for failure to state a claim without prejudice. On February 3, 2023, Lead Plaintiffs filed their third amended complaint, adding information allegedly produced to Plaintiffs in response to freedom of information requests. The third amended complaint alleges that the Company's registration statement and related prospectus for the IPO contained false and misleading statements and omissions in violation of the Securities Act by failing to disclose that (i) the Company had overbilled government payors for Preparent tests beginning in 2019 and ending in or before early 2020; (ii) there was a high probability that the Company had received, and would have to refund, a material amount of overpayments from government payors for Preparent tests; (iii) in February 2020 the Company ended a supposedly improper marketing practice on which the competitiveness of the Company's business depended; and (iv) the Company was suffering from material negative trends with respect to testing volumes, average selling prices for its tests, and revenues. Lead Plaintiffs seek certification as a class, unspecified compensatory damages, interest, costs and expenses including attorneys' fees, and unspecified extraordinary, equitable, and/or injunctive relief. The Company filed a motion to dismiss the third amended complaint with prejudice on March 20, 2023, which the court granted on July 12, 2023. Lead Plaintiffs filed a notice of appeal on August 11, 2023 and the appeal is currently before the United States Court of Appeals for the Ninth Circuit (Case No: 23-55716) with appellate briefing concluded and submitted by the parties in March 2024. Subject to a reservation of rights, the Company is advancing expenses subject to indemnification to the underwriters of the IPO. In March 2024, the Company and plaintiffs agreed to settle the litigation, subject to negotiation and entry into

definitive and binding agreements and court approval, for an amount of $1.0 million. The Company has accrued this amount in accrued expenses in the balance sheet as of December 31, 2023. The expense of $1.0 million was recorded in selling, general and administrative expenses from discontinued operations for the year ended December 31, 2023.

On June 4, 2021, a purported shareholder filed a lawsuit in the U.S. District Court for the SDCA, claiming to sue derivatively on behalf of the Company. The complaint names certain of the Company's officers and directors as defendants, and names the Company as a nominal defendant. Premised largely on the same allegations as the above-described securities lawsuit, it alleges that the individual defendants breached their fiduciary duties to the Company, wasted corporate assets, and caused the Company to issue a misleading proxy statement in violation of the Securities Exchange Act of 1934, as amended. The complaint seeks the award of unspecified damages to the Company, equitable and injunctive remedies, and an order directing the Company to reform and improve its internal controls and board oversight. It also seeks the costs and disbursements associated with bringing suit, including attorneys', consultants', and experts' fees. The case is stayed pending the resolution of the appeal in the above-described securities lawsuit. The Company intends to vigorously defend against these claims.

On August 17, 2021, the Company received a letter purportedly on behalf of a stockholder of the Company demanding that the Company's board of directors investigate and take action against certain of the Company's current and former officers and directors to recover damages for alleged breaches of fiduciary duties and related claims arising out of the IPO litigation discussed above. This matter is pending the outcome of the companion securities litigation.

Given the uncertainty of litigation, the preliminary stages of the litigation and other matters described above, and the legal standards that must be met for, among other things, success on the merits, the Company is unable to predict the ultimate outcome of these actions, and therefore cannot estimate the reasonably possible loss or range of loss, if any, that may result from these actions.

Note 10. Stockholders' Equity

Common Stock

On January 3, 2023, the Company effected a 1-for-25 reverse stock split of the Company's common stock. The Reverse Stock Split, which has been retroactively reflected throughout the consolidated financial statements, reduced the authorized shares of the Company to 164,000,000 and did not change the par value of the Company's common stock.

Registered Offerings

In November 2022, the Company entered into a securities purchase agreement with certain institutional and accredited investors relating to the offering and sale of an aggregate of (i) 1,300,250 shares of common stock and (ii) warrants to purchase 1,300,250 shares of common stock in registered direct offering (the "November 2022 Offering"). Each share was sold together with one warrant to purchase one share of common stock at a combined public offering price of $7.50 per share of the common stock and the accompanying warrant. The Company received approximately $9.0 million in net proceeds, after deducting placement agent fees and offering expenses. Approximately $3.8 million of the gross proceeds were received in the form of a waiver of the Company's December 1, 2022 interest payment on the Convertible Notes. The warrants have an exercise price of $8.22 per share, are exercisable six months following the date of issuance, and will expire five years following the initial exercise date. Pursuant to ASC 815, the Company deemed the warrants to be classified as a liability at fair value initially with subsequent changes in fair value recorded in earnings. The warrants were recorded at a fair value of $6.0 million. As the total fair value of the warrant liability and common stock exceeds the in-kind payment proceeds of $3.8 million, the Company recorded an extinguishment loss of the $1.6 million excess to other income, net in the consolidated statements of operations. The Company incurred a total of $0.8 million in issuance costs, which were allocated between the warrants and common stock on a relative fair value basis.

Additionally, as part of the November 2022 Offering, the Company agreed with certain institutional investors to amend outstanding warrants previously issued to purchase up to 104,895 shares of common stock with an exercise price of $171.50 per share and to purchase up to 403,887 shares of common stock with an exercise price of $71.00 per share. Accordingly, the Company agreed to (i) lower the exercise price of such existing warrants to $8.22 per share, (ii) provide that such existing warrants, as amended, were not exercisable until May 9, 2023 and (iii) extend the original expiration date of such existing warrants to May 9, 2028. The modified warrants are equity classified both before and after the modification and were fair valued as of the date of the amendment, this resulted in an increase in the value of the warrants and an additional $0.9 million was recorded to additional paid in capital on the consolidated balance sheet.

In January 2023, the Company issued warrants to purchase 90,000 shares of common stock to an institutional investor in exchange for the investor's agreement to waive the lockup provisions contained in the November 2022 Offering securities purchase agreement. The warrants have an exercise price of $8.22, were exercisable beginning on May 9, 2023. Pursuant to ASC 815, the

Company deemed the warrants to be classified as a liability at fair value initially with subsequent changes in fair value recorded in earnings.

In June 2023, the Company entered into a securities purchase agreement with certain institutional and accredited investors relating to the offering and sale of 1,509,434 shares of common stock in a registered direct offering at an offering price of $5.30 per share (the "June 2023 Offering"). In addition, in a concurrent private placement with the same investors, the Company issued unregistered warrants to purchase 3,018,868 shares of common stock. The warrants have an exercise price of $5.05 per share and are exercisable at any time. The Company received approximately $7.3 million in net proceeds, after deducting placement agent fees and offering expenses. Pursuant to ASC 815, the Company deemed the warrants to be classified as a liability at fair value initially with subsequent changes in fair value recorded in earnings. The warrants were recorded at a fair value of $9.0 million, as the total fair value of the warrant liability exceeds the gross proceeds of $8.0 million, the Company recorded a loss of the $1.0 million excess to gain (loss) on warrant liabilities in the consolidated statements of operations. Accordingly, there were no proceeds allocated to the common stock issued as part of this transaction. The Company incurred a total of $0.7 million in issuance costs, which were allocated between the warrants and common stock on a relative fair value basis.

In October 2023, the Company issued warrants to purchase up to 1,000,000 shares and 4,278,074 shares of the Company's common stock, with exercise prices of $1.93 per share and $1.87 per share, respectively, to accredited investors in private placement transactions. The warrants are exercisable in April 2024, six months following the dates of issuance. The investors may from time to time agree to acquire, and the Company may agree to sell, up to an aggregate of $9.9 million of common stock at any time prior to January 31, 2024. The warrants will vest in proportion to issuances described in the preceding sentence. Pursuant to ASC 815, the Company deemed the warrants to be classified as a liability at fair value initially with subsequent changes in fair value recorded in earnings. The warrants were recorded at a fair value of $6.7 million and the Company recorded a loss of the $6.7 million excess to gain (loss) on warrant liabilities in the consolidated statements of operations.

Common stock warrants

As of December 31, 2023, the Company had the following warrants outstanding to acquire shares of its common stock:

Expiration Date	Shares of common stock issuable upon exercise of warrants		Exercise Price per share
Held by Related Parties			
N/A	7,399,226	$	0.001
September 2026	16,634,507	$	3.01
May 2028	824,116	$	8.22
December 2028	2,085,372	$	5.00
December 2028	5,039,236	$	5.50
Related Parties Total	31,982,457		
Held by non-affiliates			
February 2026	69,930	$	171.50
June 2026	3,018,868	$	5.05
August 2026	452,635	$	25.00
April 2027	826,816	$	1.87
April 2027	698,107	$	1.93
May 2028	1,074,916	$	8.22
December 2028	7,352,941	$	1.36
December 2028	2,999,241	$	5.00
Non-affiliate Total	16,493,454		
Total	48,475,911		

At-The-Market Sales Agreement and Offering

In November 2021, the Company entered into an At Market Issuance Sales Agreement ("ATM Sale Agreement") with B. Riley Securities, Inc., BTIG, LLC, and H.C. Wainwright & Co. LLC ("Agents"), pursuant to which the Company may offer and sell shares of common stock having an aggregate offering price of up to $90.0 million from time to time, in “at the market” offerings through the Agents. In connection with the November 2022 Offering, the aggregate price was reduced to $70.0 million. The Company further reduced the aggregate offering price to $12.0 million in connection with the June 2023 Offering. As of October 9, 2023, the aggregate offering price was increased to $37.6 million. Sales of the shares of common stock, if any, will be made at prevailing market prices at the time of sale, or as otherwise agreed with the Agents. The Agents will receive a commission from the Company of up to 3.0% of

the gross proceeds of any shares of common stock sold under the ATM Sale Agreement. The following table provides information on the shares sold under the ATM Sale Agreement for the three months and year ended December 31, 2023 and 2022.

	Three Months Ended December 31,		Year Ended December 31,	
	2023	2022	2023	2022
Net proceeds (in millions)	$ 4.9	$ 0.6	$ 17.7	$ 7.1
Number of shares	3,799,814	52,620	6,735,839	317,155
Weighted average purchase price	$ 1.37	$ 10.93	$ 3.66	$ 30.27

Preferred Stock

Pursuant to the Company's eighth amended and restated certificate of incorporation, which went into effect immediately prior to the completion of the IPO, the Company was authorized to issue 10,000,000 shares of undesignated preferred stock. This amount and the par value of preferred stock remained unchanged after the Reverse Stock Split.

On November 10, 2022, the Board declared a dividend of one one-thousandth of a share of Series X Preferred Stock, par value $0.001 per share ("Series X Preferred Stock"), for each outstanding share of common stock to stockholders of record as of November 21, 2022. This Series X Preferred Stock entitled its holders to 3,000 votes per share exclusively on the vote for the proposal to approve the Reverse Stock Split. All shares of Series X Preferred Stock that were not present to vote on the Reverse Stock Split were redeemed by the Company (the "Initial Redemption"). Any outstanding shares of Series X Preferred Stock that were not redeemed pursuant to an Initial Redemption would be redeemed in whole, but not in part, (i) if such redemption is ordered by the Board in its sole discretion, automatically and effective on such time and date specified by the Board in its sole discretion or (ii) automatically upon the effectiveness of the Certificate of Amendment implementing the Reverse Stock Split. At the December 19, 2022 special meeting of the Company's stockholders, the holders of 136,961 shares of Series X Preferred Stock were represented in person or by proxy. Immediately prior to the special meeting, all 86,210 shares of Series X Preferred Stock that were not voted were redeemed. The remaining 136,961 outstanding shares of Series X Preferred Stock were redeemed automatically upon the effectiveness of the Certificate of Amendment on January 3, 2023.

On January 9, 2023, the Company filed a Certificate of Elimination of Series X Preferred Stock with the Secretary of State of the State of Delaware, which, effective immediately upon filing, eliminated all matters set forth in the Certificate of Designation of Series X Preferred Stock filed with the Secretary of State of the State of Delaware on November 21, 2022.

Note 11. Stock-Based Compensation

In February 2018, the Company adopted the 2018 Equity Incentive Plan ("2018 Plan"). The 2018 Plan is the successor to and continuation of the Second Amended and Restated 2012 Stock Plan ("2012 Plan") and is administered with either stock options or RSUs. The Board of Directors administers the plans. Upon adoption of the 2018 Plan, no new stock options or awards are issuable under the 2012 Plan, as amended. The 2018 Plan also provides for other types of equity to issue awards, which at this time the Company does not plan to utilize.

On June 14, 2023, the Company's stockholders approved the Fifth Amended and Restated 2018 Equity Incentive Plan ("2018 Fifth Amended Plan"), which included an increase of 5,500,000 shares of common stock reserved for issuance. As of December 31, 2023 there were 3,302,136 shares available for issuance under the 2018 Fifth Amended Plan.

On November 3, 2021, the Company's Board of Directors approved and adopted the Company's 2021 Inducement Plan ("2021 Inducement Plan") to provide for the reservation of 260,000 shares of the Company's common stock to be used exclusively for the grant of awards to individuals not previously an employee or non-employee director of the Company. As of December 31, 2023, 63,964 shares were available for grant under the 2021 Inducement Plan.

Stock Options

The following table summarizes stock option activity, which includes Performance Awards, under the 2012 Stock Plan, the 2018 Fifth Amended Plan and the 2021 Inducement Plan during the year ended December 31, 2023:

	Stock Options Outstanding	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Balance at December 31, 2022	582,557	$ 59.89		
Options granted	265,000	$ 3.54		
Options exercised	—	$ —		
Options forfeited/cancelled	(84,545)	$ 96.78		
Balance at December 31, 2023	763,012	$ 36.23	8.0	$ 0.2
Vested and expected to vest at December 31, 2023	763,012	$ 36.23	8.0	$ 0.2
Vested and exercisable at December 31, 2023	269,718	$ 66.98	7.3	$ —

The Company uses the Black-Scholes option pricing model to estimate the fair value of each option grant on the date of grant or any other measurement date. The following table sets forth the assumptions used to determine the fair value of stock options granted during the years ended December 31, 2023 and 2022:

	Year ended December 31,	
	2023	2022
Risk-free interest rate	3.5% - 4.7%	2.0% - 4.2%
Expected volatility	97.6% - 102.7%	90.7% - 101.3%
Expected dividend yield	—	—
Expected life (years)	5.5 - 6.3	5.5 - 6.3

The weighted-average grant date fair value of options granted during the years ended December 31, 2023 and 2022 was $2.49 per option and $19.09 per option, respectively.

Restricted Stock Units

The following table summarizes RSU activity for the year ended December 31, 2023:

	Number of Shares	Weighted-Average Grant Date Fair Value
Balance at December 31, 2022	278,112	$ 38.95
Granted	3,703,321	$ 3.09
Vested	(1,370,520)	$ 9.70
Forfeited/cancelled	(73,556)	$ 7.96
Balance at December 31, 2023	2,537,357	$ 3.31

In August 2023, the Board of Directors approved the acceleration of vesting of all unvested, outstanding RSUs. As a result of this modification, an additional $7.9 million of stock-based compensation expense was recognized for the year ended December 31, 2023.

2020 Employee Stock Purchase Plan

In June 2020, the Company's board of directors adopted the ESPP with 20,400 shares of common stock reserved for future issuance under the ESPP. The ESPP also provides for automatic annual increases in the number of shares of common stock reserved for issuance. As of December 31, 2023 there were 71,450 total shares of common stock reserved for future issuance. The ESPP was suspended on November 6, 2022. All employee payroll withholdings related to the ESPP were either reimbursed or shares were purchased subsequent to the suspension of the program.

Stock-Based Compensation Expense

The following table presents total stock-based compensation expense included in each functional line item in the accompanying consolidated statements of operations (in thousands):

	Year Ended December 31,	
	2023	2022
Research and development	6,979	2,626
Selling, general and administrative	9,496	5,178
Total stock-based compensation expense	$ 16,475	$ 7,804

At December 31, 2023 there was $6.6 million of compensation cost related to unvested stock options expected to be recognized over a remaining weighted average vesting period of 2.5 years and $7.5 million of compensation cost related to unvested RSUs expected to be recognized over a remaining weighted average vesting period of 3.6 years.

Note 12. Income Taxes

The provision for income taxes consists of the following (in thousands):

	Year Ended December 31,	
	2023	2022
Current provision:		
Federal	$ —	$ (546)
State	(15)	(347)
Foreign	—	126
	(15)	(767)
Deferred expense:		
Federal	(75)	347
State	—	—
	(75)	347
Net income tax provision	$ (90)	$ (420)

The components of income tax benefit from continuing operations relate to the following (in thousands):

	Year Ended December 31,	
	2023	2022
Income tax benefit at U.S. federal statutory rate	$ (26,129)	$ (10,343)
Cancellation of debt	8,161	—
Inducement loss	11,172	—
Extinguishment loss	1,336	—
Convertible debt and warrant liabilities	(3,781)	(4,390)
Derivative Liability	822	—
Stock-based compensation	2,687	1,504
Tax refunds	(35)	(900)
Change in valuation allowance	5,556	13,004
Other	121	705
Total income tax benefit	$ (90)	$ (420)

Deferred income taxes reflect the net tax effects of (a) temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes, and (b) operating losses and tax credit

carryforwards. Significant components of the Company's deferred tax assets and deferred tax liabilities as of December 31, 2023 and 2022 are presented below (in thousands):

	December 31, 2023	December 31, 2022
Deferred tax assets:		
Net operating losses and carryforwards	$ 139,735	$ 137,149
Section 174 Capitalization	7,536	4,027
Reserves	656	949
Accrued expenses	1,159	527
Lease liability	360	343
Stock-based compensation	1,460	2,591
Other, net	—	101
Total deferred tax assets	150,906	145,687
Deferred tax liabilities:		
Fixed assets	(222)	(726)
Intangible assets	(1,110)	(1,201)
Investment in Enumera	(574)	(1,317)
ROU asset	(339)	(340)
Prepaid expenses	(271)	(743)
Convertible debt	—	(552)
Total deferred tax liabilities	(2,516)	(4,879)
Net deferred tax assets	148,390	140,808
Less: valuation allowance	(148,649)	(141,155)
Net deferred tax liabilities	$ (259)	$ (347)

The Company has established a valuation allowance against net deferred tax assets due to the uncertainty that such assets will be realized. The Company periodically evaluates the recoverability of the deferred assets. At such time as it is determined that it is more likely than not that the deferred tax asset will be realized, the valuation allowance will be reduced. The change in the valuation allowance for the year ended December 31, 2023 was an increase of $7.5 million.

At December 31, 2023, the Company had federal and state income tax net operating loss (“NOL”) carryforwards of approximately $500.3 million and $218.6 million, respectively. The U.S. federal NOLs will be carried forward indefinitely and state NOLs will begin to expire in various years, depending on the applicable jurisdiction. Federal NOL carryforwards generated post the Tax Cuts and Jobs Act of 2017 may be carried forward indefinitely, subject to the 80% taxable income limitation on the utilization of the carryforwards. In addition, the Company has federal and state research and expenditure credit carryforwards of approximately $8.5 million and $1.9 million, respectively, as of December 31, 2023. The federal research and expenditure credit will begin to expire after 2033 unless otherwise utilized and the state research and expenditure credit may be carried forward indefinitely.

Pursuant to Section 382 and Section 383 of the Internal Revenue Code, annual use of the Company’s NOL carryforwards and tax credit carryforwards may be limited as a result of cumulative changes of ownership resulting in a change of control of the Company. The Company performed a formal study through the date of the IPO and determined future utilization of tax attribute carryforwards are not limited per Section 382 of the Internal Revenue Code. The Company has not updated their 382 study since the IPO offering 2020. Any future changes may limit future utilization of tax attribute carryforwards. Due to the existence of the valuation allowance, limitations created by future ownership changes, if any, will not impact the Company's effective tax rate.

In accordance with ASC 740-10, *Income Taxes—Overall,* the impact of an uncertain income tax position on the income tax return must be recognized at the largest amount that is more likely than not to be sustained upon audit by the relevant taxing authority. An uncertain income tax position will not be recognized if it has less than a 50% likelihood of being sustained. The Company has no uncertain tax positions at December 31, 2023.

The Company is subject to taxation in the United States and various U.S. state jurisdictions. Multiple tax years remain open to examination depending on the applicable jurisdiction. The Company’s policy is to recognize interest and penalties related to income tax matters in the provision for income taxes. At December 31, 2023, there were no interest and penalties related to uncertain tax positions.

Note 13. Net Loss Per Share

The table below provides potentially dilutive securities in equivalent shares of common stock not included in the Company's calculation of diluted loss per share because to do so would be antidilutive:

	Year Ended December 31,	
	2023	2022
Stock options to purchase common stock	763,012	582,557
Restricted stock units	2,537,357	278,112
Common stock warrant	48,475,911	2,331,597
Common stock issuable upon conversion of Convertible Notes	26,332,126	1,623,547
Total	78,108,406	4,815,813

Note 14. Employee Benefit Plan

The Company has a qualified 401(k) employee savings plan for the benefit of its employees ("401(k) Plan"). Substantially all employees are eligible to participate in the 401(k) Plan. Under the 401(k) Plan, employees can contribute and defer taxes on compensation contributed. The Company has the option to make discretionary profit-sharing contributions to the 401(k) Plan. The Company made employer contributions to the 401(k) Plan of $0.5 million for both of the years ended December 31, 2023 and 2022.

Note 15. Subsequent Events

From January 1, 2024 through March 27, 2024, the Company received net proceeds of $2.8 million, after deducting commissions and other offering expenses, from the sale of 2,591,662 shares under the ATM Sale Agreement. The Company sold such shares at a weighted average purchase price of $1.13 per share.

On March 8, 2024 the Company entered into an exchange agreement with a holder of the Company's 2025 Convertible Notes, pursuant to which the Company agreed to acquire an aggregate of $5.6 million of 2025 Convertible Notes from the holder in exchange for (i) $3.8 million in aggregate principal amount of 2028 Convertible Notes, and (ii) accrued and unpaid interest on the 2025 Convertible Notes exchanged. The Company also entered into a note purchase agreement with the investor to purchase $2.8 million in aggregate principal amount of 2028 Convertible Notes from the Company for cash at par value. Additionally, as part of the agreements, the investor was granted warrants to purchase 2,000,000 shares of common stock.

On March 31, 2024, the Company entered into a securities purchase agreement with certain institutional and accredited investors relating to (1) the offering and sale of an aggregate of 5,454,548 shares of the Company's common stock at an offering price of $1.10 per share in a registered direct offering (the "Offering") and (2) the issuance of unregistered warrants to purchase up to 5,454,548 shares of Common Stock with an exercise price of $1.10 to certain accredited investors in a concurrent private placement (the "Private Placement"). The Offering and the Private Placement are expected to close on April 3, 2024. The Company expects to receive gross proceeds from the Offering of approximately $6 million before deducting placement agent fees and estimated offering expenses.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Management's Evaluation of Disclosure Controls and Procedures

As of December 31, 2023, our management, with the participation and supervision of our principal executive officer and our principal financial officer, evaluated our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the Company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost benefit relationship of possible controls and procedures. Based on this evaluation, our principal executive officer and our principal financial officer concluded that our disclosure controls and procedures were effective as of December 31, 2023 to provide reasonable assurance that information we are required to disclose in reports that we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in SEC rules and forms, and that such information is accumulated and communicated to our management, including our principal executive officer and our principal financial officer, as appropriate, to allow timely decisions regarding required disclosure.

Changes in Internal Control over Financial Reporting

No changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) occurred during the quarter ended December 31, 2023 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rules 13a-15(f) under the Exchange Act). Internal control over financial reporting is a process designed under the supervision and with the participation of our management, including our principal executive officer and our principal financial officer, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles in the United States.

As of December 31, 2023, our management assessed the effectiveness of our internal control over financial reporting using the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control-Integrated Framework. Based on this assessment, our management concluded that our internal control over financial reporting was effective as of December 31, 2023.

Attestation Report of Registered Public Accounting Firm

As an emerging growth company, we are not required to provide an attestation report on our internal control over financial reporting issued by the Company's independent registered public accounting firm.

Item 9B. Other Information.

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Directors and Executive Officers

Biographical and other information regarding our executive officers and directors is set forth below. There are no family relationships among any of our directors or executive officers.

Name	Age	Position
Executive Officers		
Adi Mohanty	57	Chief Executive Officer and Director
Eric d'Esparbes	56	Chief Financial Officer
Clarke Neumann	60	SVP, General Counsel and Secretary
Non-Employee Directors		
Jeffrey D. Alter [(1)(3)]	61	Independent Chairman of the Board
Jeffrey A. Ferrell [(2)(3)]	49	Independent Director
Jill Howe [(1)(3)]	48	Independent Director
Brian L. Kotzin, M.D. [(2)]	75	Independent Director
Lynne Powell [(1)]	57	Independent Director

(1) Member of the Audit Committee
(2) Member of the Compensation Committee
(3) Member of the Nominating & Corporate Governance Committee (the "Nominating Committee")

Executive Officers

Adi Mohanty. Mr. Mohanty has served as our Chief Executive Officer and a member of our Board since November 2021. Prior to joining the Company, Mr. Mohanty founded EnCellX, Inc., a functional cell selection company, and he served as its Chief Executive Officer from December 2019 to November 2021. From 2014 to September 2018, he served as Chief Executive Officer, President and a member of the board of directors of BioTime (now Lineage Cell Therapeutics, Inc. (NYSE: LCTX)), a biotechnology company. Prior to BioTime, Mr. Mohanty served in various leadership roles at Transkaryotic Therapies, Inc., a biopharmaceutical company, and then at Shire PLC following its acquisition of Transkaryotic Therapies. Mr. Mohanty held several executive positions at Shire spanning global technical operations, product development and commercial operations. He was responsible for a global franchise in rare diseases with over $600 million in sales and operations in over 50 countries. His most recent role at Shire was as President of Regenerative Medicine, a full vertically integrated business unit of Shire with commercial and clinical products. Earlier in his career, Mr. Mohanty held a variety of management positions in the bioscience division of Baxter International Inc. (NYSE: BAX), a healthcare company. Mr. Mohanty previously served on the board of directors of Oncocyte Corp. (Nasdaq: OCX), a molecular diagnostics company, from 2015 to 2020 and Asterias Biotherapeutics, Inc., a cell therapy company, from 2015 to 2018. Mr. Mohanty earned his M.S. in Chemical Engineering from Clarkson University and his M.B.A. from Saint Mary's College, California.

We believe Mr. Mohanty is qualified to serve on our Board because of his extensive leadership experience in the biotechnology industry.

Eric d'Esparbes. Mr. d'Esparbes has served as our Chief Financial Officer since May 2019 and he served as our interim Chief Executive Officer from September 2021 to November 2021. With a focus on establishing strong financial controls and resolving legacy company challenges, Mr. d'Esparbes led the effort to bring the Company public in 2020, raising capital to support the Company's key innovation programs. He was also one of the leading forces behind its transformation into a highly focused biotherapeutics company. From 2014 to August 2018, Mr. d'Esparbes served as Chief Financial Officer of Innoviva, Inc. (Nasdaq: INVA), a publicly traded biotechnology company managing a portfolio of drug-device combination medicines for the treatment of asthma and chronic obstructive pulmonary disease, which are sold globally by GlaxoSmithKline, where he was responsible for all aspects of the finance function including financial accounting, capital planning, audit, tax and investor relations. Mr. d'Esparbes also served as the interim Principal Executive Officer of Innoviva from February 2018 to June 2018. Prior to this, Mr. d'Esparbes held leadership positions as Chief Financial Officer for Joule Unlimited, Vice President of Finance for global energy company AEI, Inc. and Chief Financial Officer for Meiya Power Company (now CNG New Energy), where he collaborated with large private equity investors to raise and optimize capital. In his previous CFO roles, he was responsible for profit and loss management of up to $3.5 billion annual global sales. Mr. d'Esparbes earned his bachelor's degree from Hautes Études Commercial in Montréal, Canada.

Clarke Neumann, J.D. Mr. Neumann has served as our General Counsel and Secretary since September 2014. Previously, Mr. Neumann served as Vice President, Associate General Counsel and Assistant Secretary of Sequenom, Inc., a molecular diagnostic testing and genetics analysis company, from 2012 to 2014, as Vice President, General Counsel and Assistant Secretary from 2001 to

2012 and as Corporate Counsel from 1999 to 2001. From 1993 to 1999, Mr. Neumann was an attorney at Lyon & Lyon, LLP, specializing in intellectual property litigation, strategic counseling, business litigation and transactional matters. Mr. Neumann earned his B.S. in Chemical Engineering from Pennsylvania State University and his J.D. from Loyola Law School, Los Angeles.

Non-employee Directors

Jeffrey D. Alter. Mr. Alter has served as a member of our Board since January 2019 and as the Chairman of our Board since November 2021. Mr. Alter has served as Chief Executive Officer and as a member of the board of directors of Sound Inpatient Physicians, Inc., a multi-specialty physician practice, since September 2023. Mr. Alter served as Chief Executive Officer and as a member of the board of directors of Summit Health, a healthcare network, from October 2021 to January 2023. Prior to joining Summit Health, Mr. Alter served as the Executive Vice President of IngenioRX and Anthem Health Solutions, at Anthem, Inc. (NYSE: ANTM), a health benefits company, from September 2020 to October 2021. From July 2018 to September 2020, Mr. Alter served as President of Arcturus One Consulting, LLC, a consulting company. From 2004 to June 2018, he served in various executive leadership positions at UnitedHealthcare Inc., a health plan business, including as Chief Executive Officer of its commercial group from 2014 to June 2018, as Chief Executive Officer of its employer and individual business from 2011 to 2014, as Chief Executive Officer of the Northeast Region from 2008 to 2011, as Chief Operating Officer from 2005 to 2008 and as Chief Financial Officer of the Northeast Region from 2004 to 2005. Mr. Alter earned both his B.S. in Marketing and his M.B.A. in Finance from Saint John's University, New York.

We believe Mr. Alter is qualified to serve on our Board because of his extensive leadership experience in the healthcare industry and finance experience.

Jeffrey A. Ferrell. Mr. Ferrell has served as a member of our Board since June 2014. Mr. Ferrell has served as the Managing Partner of Athyrium Capital Management, LP, a life sciences focused investment and advisory company, since 2008. Prior to Athyrium Capital, Mr. Ferrell served in a number of roles at Lehman Brothers Holdings Inc., a former financial services firm, including as Senior Vice President from 2005 to 2008 and as Vice President in its private equity division from 2002 to 2005. From 1997 to 2001, Mr. Ferrell served as a principal at Schroder Ventures Life Sciences, a healthcare fund. Mr. Ferrell previously served as a director of Lpath, Inc., a biotechnology company, from 2007 to 2016. Mr. Ferrell earned his A.B. in Biochemical Sciences from Harvard University.

We believe Mr. Ferrell is qualified to serve on our Board because of his extensive experience investing in and guiding early stage life sciences companies.

Jill Howe. Ms. Howe has served as a member of our Board since November 2021. Ms. Howe has served as Chief Financial Officer of Lineage Cell Therapeutics, Inc. (NYSE: LCTX), a biotechnology company, since November 2022. Prior to joining Lineage Cell Therapeutics, she served as Chief Financial Officer at DTx Pharma, Inc., a biotechnology company, from June 2021 to July 2022. Previously, Ms. Howe served as Treasurer and Vice President of Finance at Gossamer Bio, Inc. (Nasdaq: GOSS), a clinical-stage biopharmaceutical company, from January 2018 to June 2021, where she was the internal project lead for the company's initial public offering, follow-on offering and debt offerings, and oversaw finance for 18 subsidiaries across the U.S. and Ireland. Prior to Gossamer Bio, she served as Controller of Amplyx Pharmaceuticals, Inc., a biopharmaceutical company, from 2016 to December 2017. She previously held positions, including as Controller and Director of Finance, at Receptos, Inc., a biotechnology company, and at Somaxon Pharmaceuticals, Inc., a specialty pharmaceutical company. Ms. Howe has served on the board of directors at Codagenix, Inc., a clinical stage synthetic biology company, since 2021. Ms. Howe earned a B.S. in Accountancy from San Diego State University.

We believe Ms. Howe is qualified to serve on our Board because of her financial expertise in the biotechnology industry.

Brian L. Kotzin, M.D. Dr. Kotzin has served as a member of our Board since June 2019. Dr. Kotzin has served as Chief Executive Officer of BL Kotzin, Inc., a consulting services company, since 2015. Dr. Kotzin served as Chief Medical Officer, Senior Vice President of Clinical Development and Head of Immunology at Nektar Therapeutics (Nasdaq: NKTR), a biopharmaceutical company, from April 2022 to June 2023, and has previously held various other leadership positions at Nektar, including serving as Senior Vice President of Clinical Development and Head of Immunology from September 2021 to April 2022, as Chief Medical Officer and Head of Clinical Development from January 2021 to September 2021 and as Senior Vice President of Clinical Development since April 2017. Prior to Nektar, from 2004 to 2015, Dr. Kotzin served as Vice President of Global Clinical Development and Head of the Inflammation Therapeutic Area at Amgen Inc. (Nasdaq: AMGN), a biopharmaceutical company. During his employment at Amgen, he also served as Vice President of Translational Sciences and Head of Medical Sciences from 2006 to 2011. From 1981 to 2004, Dr. Kotzin served as a faculty member in the Division of Rheumatology of the Department of Medicine and Department of Immunology at the University of Colorado Health Sciences Center in Denver, Colorado. During this time, he also served as Head of Clinical Immunology in the Department of Medicine and as director of the Autoimmunity Center of Excellence from 1998 to 2004. Dr. Kotzin has been elected as a Master of the American College of Rheumatology and is an elected

Member of the American Society of Clinical Investigation and the Association of American Physicians. He has served as a member of the board of directors of Kyverna Therapeutics, Inc., a cell therapy company, since 2019, Rigel Pharmaceuticals, Inc. (Nasdaq: RIGL), a biotechnology company, since 2017, and Genascence, Inc., a gene therapy biotechnology company, since 2022. Dr. Kotzin previously served as a member of the board of directors of Vera Therapeutics, Inc. (Nasdaq: VERA), a clinical stage biotechnology company, in 2020. Dr. Kotzin earned his M.D. from Stanford University and his B.S. in Mathematics from the University of Southern California.

We believe Dr. Kotzin is qualified to serve on our Board because of his extensive academic research experience in immunology and experience as a senior executive and board member for life sciences companies

Lynne Powell. Ms. Powell has served as a member of our Board since February 2019. Since September 2019 and October 2019, Ms. Powell has served as Chief Executive Officer and as a member of the board of directors, respectively, of Tavanta Therapeutics (formerly known as Druggability Technologies Holdings Ltd prior to a reorganization), a specialty pharmaceutical company. Prior to joining Tavanta, Ms. Powell served as Senior Vice President and Chief Commercial Officer of BioCryst Pharmaceuticals, Inc. (Nasdaq: BCRX), a biotherapeutics company, from 2015 to July 2019. From 2010 to 2014, Ms. Powell served as Senior Vice President of North American Commercial Operations at CSL Behring, a biotherapeutics company. She earned her B.S. in Applied Biology, Pharmacology & Toxicology from the University of East London and her M.B.A. from Monash University (Australia) and Warwick University (UK).

We believe Ms. Powell is qualified to serve on our Board because of her extensive experience as a senior executive and board member in the pharmaceutical industry.

Code of Business Conduct and Ethics

Our Board has adopted a Code of Business Conduct and Ethics that establishes the standards of ethical conduct applicable to all our directors, officers and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. It addresses, among other matters, compliance with laws and policies, conflicts of interest, corporate opportunities, regulatory reporting, external communications, confidentiality requirements, insider trading, proper use of assets and how to report compliance concerns. A copy of the code is available on our website at https://investors.bioratherapeutics.com/, under "Governance." We intend to disclose any amendments to the code, or any waivers of its requirements, on our website to the extent required by applicable rules. Our Board is responsible for applying and interpreting the code in situations where questions are presented to it.

Audit Committee and Audit Committee Financial Expert

Our Board has a separately designated Audit Committee. The members of our Audit Committee are Mr. Alter, Ms. Howe, and Ms. Powell, each of whom qualifies as an "independent" director for audit committee purposes, as defined under Nasdaq listing rules and the rules and regulations established by the SEC. Ms. Howe qualifies as an "audit committee financial expert," as that term is defined in the rules and regulations established by the SEC, and all members of the Audit Committee are "financially literate" under Nasdaq listing rules.

Item 11. Executive Compensation.

Our named executive officers ("NEOs") for 2023, which consist of our principal executive officer and the next two most highly-compensated executives who served during the year ended December 31, 2023, are:

- Adi Mohanty, our Chief Executive Officer, or CEO;
- Eric d'Esparbes, our Chief Financial Officer and former interim CEO; and
- Clarke Neumann, our SVP, General Counsel and Secretary.

2023 Summary Compensation Table

The following table summarizes the compensation awarded to, earned by, or paid to our NEOs for 2023 and 2022.

Name and Principal Position	Year	Salary ($)	Stock Awards ($)[1]	Option Awards ($)[1]	Non-Equity Incentive Plan Compensation ($)[2]	All Other Compensation ($)[3]	Total ($)
Adi Mohanty	2023	574,141	2,154,881	—	388,125	21,870	3,139,017
Chief Executive Officer	2022	550,000	1,171,875	1,492,015	288,750	20,070	3,522,710
Eric d'Esparbes	2023	500,816	848,997	—	225,573	21,870	1,597,256
Chief Financial Officer	2022	486,130	450,998	576,680	146,003	19,773	1,679,584
Clarke Neumann	2023	483,034	808,302	—	217,641	23,940	1,532,917
SVP, General Counsel and Secretary	2022	464,550	364,815	466,527	139,514	20,070	1,455,476

(1) Amounts shown in this column represent the aggregate grant date fair value (calculated in accordance with Financial Accounting Standards Board Accounting Standards Codification Topic 718) of stock awards and stock options granted during the year. A description of the methodologies and assumptions we use to value equity awards and the manner in which we recognize the related expense are described in Note 11 to our consolidated financial statements, Stock-Based Compensation. These amounts may not correspond to the actual value eventually realized by each NEO because the value depends on the market value of our common stock at the time the award vests or is exercised.

(2) On January 30, 2024, the Compensation Committee approved the non-equity incentive plan compensation earned in respect of 2023 as shown in the 2023 Summary Compensation Table for Eric d'Esparbes and Clarke Neumann and on February 6, 2024 the Board of Directors approved the non-equity incentive plan compensation earned in respect of 2023 as shown in the 2023 Summary Compensation Table for Adi Mohanty. Such bonuses are expected to be paid no later than June 30, 2024.

(3) For each NEO, the amounts shown in this column represent the value of life insurance premiums paid by the Company and the value of 401(k) contributions made by the Company.

Outstanding Equity Awards at 2023 Fiscal-Year End Table

The following table sets forth information regarding outstanding equity awards as of December 31, 2023 for each of our NEOs.

	Option Awards					Stock Awards	
Name	Grant Date	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price ($)	Option Expiration Date	Number of Shares or Units of Stock That Have Not Vested (#)	Market Value of Shares or Units of Stock That Have Not Vested ($)
Adi Mohanty	11/8/2021[1]	43,476	39,999	88.50	11/8/2031	—	—
	5/15/2022[2]	39,506	60,310	18.75	5/15/2032	—	—
	8/15/2023[10]	—	—	—	—	559,450	755,258
Eric d'Esparbes	1/9/2020[3]	1,136	—	247.25	1/9/2030	—	—
	1/15/2020[4]	3,568	76	247.25	1/15/2030	—	—
	3/4/2020	311	—	244.00	3/4/2030	—	—
	8/15/2020[5]	2,522	431	192.75	8/15/2030	—	—
	3/15/2021	2,718	—	118.25	3/15/2031	—	—
	4/15/2021[6]	4,834	2,197	85.25	4/15/2031	—	—
	4/15/2022[7]	6,562	8,438	25.00	4/15/2032	—	—
	5/15/2022[8]	7,874	11,025	18.75	5/15/2032	—	—
	8/15/2023[10]	—	—	—	—	219,650	296,528
Clarke Neumann	9/10/2014	1,035	—	162.18	9/10/2024	—	—
	2/1/2015	388	—	268.75	2/1/2025	—	—
	2/24/2016	388	—	313.53	2/24/2026	—	—
	1/9/2020[3]	1,810	—	247.25	1/9/2030	—	—
	3/4/2020[9]	1,334	58	244.00	3/4/2030	—	—
	3/4/2020	257	—	244.00	3/4/2030	—	—
	8/15/2020[5]	1,437	246	192.75	8/15/2030	—	—
	3/15/2021	3,565	—	118.25	3/15/2031	—	—
	4/15/2021[6]	5,039	2,290	85.25	4/15/2031	—	—
	4/15/2022[7]	5,235	6,732	25.00	4/15/2032	—	—
	5/15/2022[8]	6,460	9,049	18.75	5/15/2032	—	—
	8/15/2023[10]	—	—	—	—	210,175	283,736

(1) The stock options granted on November 8, 2021 vest over a four-year period, with 25% vesting on the one-year anniversary of the date of grant and then in equal monthly installments thereafter.
(2) The stock options granted on May 15, 2022 vest over a four-year period, with 25% vesting on the one-year anniversary of the date of grant and then in equal monthly installments thereafter.
(3) On January 9, 2020, our Board and stockholders approved the reduction of the exercise price of the stock options to $247.25 to reflect the current fair market value of our common stock on such date.
(4) The stock options granted on January 15, 2020 vest over a four-year period, with 25% vesting on the one-year anniversary of the date of grant and then in equal monthly installments thereafter.
(5) The stock options granted on August 15, 2020 vest over a four-year period, in equal monthly installments ending on July 15, 2024.
(6) The stock options granted on April 15, 2021 vest over a four-year period in equal monthly installments ending on March 15, 2025.
(7) The stock options granted on April 15, 2022 vest over a four-year period in equal monthly installments ending on April 15, 2026.
(8) The stock options granted on May 15, 2022 vest over a four-year period in equal monthly installments ending on May 15, 2026.
(9) The stock options granted on March 4, 2020 vested over a four-year period in equal monthly installments ending on February 4, 2024.
(10) The RSUs granted on August 15, 2023 vest 25% on August 15, 2024 and thereafter in semi-annual installments beginning on February 15, 2025 and ending on August 15, 2027.

Employment Agreements

We do not have employment agreements with any of our NEOs at this time, but, in connection with Messrs. Mohanty's, d'Esparbes' and Neumann's commencement of employment, we extended offer letters to each of them that provide for base salary, participation in benefit plans and eligibility to earn an annual bonus. In addition, the offer letters provided for the grant of stock options and, in some cases, restricted stock units ("RSUs"), to each NEO, which are reflected in the Outstanding Equity Awards at 2023 Fiscal-Year End Table above. The offer letters also included a brief protection of confidential information commitment and related representations.

Base Salary

Messrs. Mohanty's, d'Esparbes' and Neumann's base salaries for 2023 were $575,000, $501,275 and $483,647, respectively, and such amounts represent ordinary course increases from the prior year equal to 4.5%, 3% and 4%, respectively. At the beginning of fiscal year 2024, the Compensation Committee approved ordinary course increases in base salary for Messrs. Mohanty, d'Esparbes and Neumann equal to 4.0%, 2.7% and 2.3%, respectively, resulting in base salaries equal to $598,000, $515,000 and $495,000, respectively.

Incentive Compensation

Annual Incentive. For fiscal 2023 our NEOs were eligible to receive an annual incentive bonus determined as a percentage of base salary based upon the achievement of pre-established corporate performance goals, which for 2023 included NaviCap Phase 1 IND submission weighted at 15%, NaviCap Phase 1 first patient in weighted at 15%, NaviCap Phase 1 last patient out weighted at 20%, NaviCap Functional DDS3 prototype device (performance demonstrated on benchtop) weighted at 10%, BioJet Preclinical PK data that supports further development with collaborator agreement weighted at 10%, sign broader Pharma partnership for BioJet (contingent on preclinical data) weighted at 10%, manage corporate spend within budget weighted at 10%, financing activities to support operations weighted at 10%, and stretch goal to optimize capital structure (reduce/remove debt) weighted at 10%. For 2023, the target award opportunities were 75%, 50% and 50% of base salary for each of Messrs. Mohanty, d'Esparbes and Neumann, respectively. Performance was measured at fiscal year-end and the Compensation Committee and the Board of Directors determined that the corporate goals were achieved at 90% and as a result decided to award bonuses as reported in the 2023 Summary Compensation Table for Messrs. Mohanty, d'Esparbes and Neumann.

Equity Incentive. We maintain our 2018 Equity Incentive Plan (as amended, the "2018 Plan") pursuant to which we currently grant stock option and RSU awards to eligible participants. We also maintain our 2021 Inducement Plan (the "2021 Plan"), pursuant to which we granted equity awards to Mr. Mohanty as a material inducement to his entry into employment with us in 2021. In March and August of 2023, each NEO received equity awards under the 2018 Plan in the form of RSUs, subject to our standard four-year vesting schedule. The equity awards were awarded in two tranches due to limited available shares in our 2018 Plan prior to approval by our stockholders in June 2023 to increase the number of shares authorized under our 2018 Plan.

Post-Employment Compensation and Change in Control Payments and Benefits

In December 2019, our Board adopted the Biora Therapeutics, Inc. Severance Plan (the "Severance Plan"), pursuant to which certain senior employees, including our NEOs, may become eligible to receive compensation and benefits upon certain qualifying terminations of employment. In the event that an NEO is terminated by the company without cause or voluntarily terminates employment with good reason (with "cause" and "good reason" each as defined in the Severance Plan), in either case more than three months prior to or 13 months or more following a change in control (as defined in the Severance Plan), subject to execution of a general release of claims in favor of the company and compliance with various standard restrictive covenants (such as protection of confidential information and non-disparagement commitments), the NEO is entitled to receive: (i) continued payment of base salary (for a period of 12 months, in the case of our CEO and Mr. d'Esparbes, and for a period of nine months, in the case of Mr. Neumann); and (ii) payment of the before-tax cost of the NEO's premiums to continue coverage (the "Continued Coverage") for the NEO and the NEO's eligible dependents, if any, under the company's health, vision and/or dental benefit plans to the extent such NEO (and eligible dependents, if applicable) were enrolled prior to such termination (for a period of 12 months, in the case of our CEO and Mr. d'Esparbes, and for a period of nine months, in the case of Mr. Neumann) ((i) and (ii) collectively, the "Non-Change in Control Benefits"). In the event that an NEO is terminated by the company without cause or voluntarily terminates employment with good reason, in either case within the period that is three months prior to or 13 months following a change in control, subject to execution of a general release of claims in favor of the company, the NEO is entitled to receive: (i) a lump sum payment within 30 days of the change in control equal to 24 months of base salary for the CEO and Mr. d'Esparbes and 18 months of base salary for Mr. Neumann; (ii) a lump sum payment within 30 days of the change in control equal to the NEO's average cash incentive bonus earned for the two most recently completed fiscal years multiplied by 2, in the case of the CEO and Mr. d'Esparbes, and by 1.5, in the case of Mr. Neumann; (iii) the Continued Coverage for a period of 24 months (or such shorter period as required by law), in the case of the CEO and Mr. d'Esparbes, and 18 months, in the case of Mr. Neumann; and (iv) all unvested time-based equity awards will accelerate in full and all unvested performance-based equity awards that are outstanding as of the termination date will vest, if at all, based on actual performance for the portion of the performance period ending shortly prior to the occurrence of the change in control as if such partial performance period were the entire performance period.

401(k) Plan

We offer our eligible full-time employees, including our NEOs, the opportunity to participate in our tax-qualified 401(k) plan. Employees can contribute 1% to 85% of their eligible earnings up to the Internal Revenue Service's annual limits, which is generally $23,000 for 2024. We provide a match of 60% of the first 10% contributed. The matches we provided to our NEOs in 2023 are reflected in the "All Other Compensation" column of the 2023 Summary Compensation Table above. The matching funds that we provide are 100% vested after the completion of one year of service.

Other Benefits

We do not maintain any defined benefit pension plans or any nonqualified deferred compensation plans. We previously maintained an Employee Stock Purchase Plan in order to enable eligible employees, including our eligible NEOs, to purchase shares of our common stock at a discount, but that plan was suspended in 2022.

Clawback Policy

Effective as of October 2, 2023, we adopted a clawback policy intended to comply with the requirements of Nasdaq Listing Standard 5608 implementing Rule 10D-1 under the Exchange Act. In the event the Company is required to prepare an accounting restatement of the Company's financial statements due to material non-compliance with any financial reporting requirement under the federal securities laws, the Company will recover, on a reasonably prompt basis, the excess incentive-based compensation received by any covered executive, including the NEOs, during the prior three fiscal years that exceeds the amount that the executive otherwise would have received had the incentive-based compensation been determined based on the restated financial statements.

Director Compensation

Outside Director Compensation Policy

We adopted a policy for compensating our non-employee directors with a combination of cash and equity, with such equity awards being subject to the terms and conditions of our 2018 Plan and the RSU Agreement and Stock Option Agreement thereunder, and related forms of grant notices approved by the Board.

Cash Compensation. Each of our non-employee directors is eligible to receive a $50,000 ($90,000 for our Chairman, Jeffrey D. Alter) annual cash retainer for serving as a member of the Board as well as the following additional annual cash retainers for their committee service:

	Chair	Member
Audit Committee	$ 20,000	$ 8,000
Compensation Committee	15,000	6,000
Nominating Committee	10,000	5,000

Each annual cash retainer and additional annual fee is paid quarterly in advance on a prorated basis. In addition, we reimburse all of our directors for their reasonable out-of-pocket expenses, including travel, food and lodging, incurred by them in connection with attendance at Board and committee meetings.

Equity Compensation. New non-employee directors are entitled to receive an initial equity grant of 30,000 RSUs and 30,000 stock options. Subject to the director's continued service, such initial equity awards vest in equal annual installments over a three-year period following the date of grant. In addition, in 2023 each non-employee director was entitled to receive an annual equity grant of 12,500 RSUs and 12,500 stock options vesting, subject to continued service through such date, on the earlier of (i) the one-year anniversary of the date of grant or (ii) the date of the following year's annual meeting of stockholders.

Fiscal Year 2023 Outside Director Compensation Table

Name	Fees Earned or Paid in Cash ($)	Stock Awards ($)[1]	Option Awards ($)[1]	All Other Compensation ($)	Total ($)
Jeffrey D. Alter	$ 103,000	58,688	46,424	—	208,112
Jeffrey A. Ferrell	—	—	—	—	—
Jill Howe	75,000	58,688	46,424	—	180,112
Brian L. Kotzin, M.D.	65,000	58,688	46,424	15,000 [3]	185,112
Lynne Powell	58,000	58,688	46,424	—	163,112
Surbhi Sarna [4]	28,000	—	—	—	28,000

(1) Amounts shown in this column represent the aggregate grant date fair value (calculated in accordance with Financial Accounting Standards Board Accounting Standards Codification Topic 718 "*Compensation—Stock Compensation*") of stock awards and stock options granted during the year. A description of the methodologies and assumptions we use to value equity awards and the manner in which we recognize the related expense are described in Note 11 to our consolidated financial statements, Stock-Based Compensation. These amounts may not correspond to the actual value eventually realized by each director because the value depends on the market value of our common stock at the time the award vests or is exercised. As of December 31, 2023, Mr. Alter held 12,500 RSUs and 21,679 stock options, Mr. Ferrell held no RSUs and no stock options, Ms. Howe held 14,035 RSUs and 21,767 stock options, Dr. Kotzin held 12,500 RSUs and 21,679 stock options, Ms. Powell held 12,500 RSUs and 21,679 stock options, and Ms. Sarna held no RSUs and no stock options.

(2) Mr. Ferrell elected not to receive any compensation from us for his services in 2023.

(3) Represents amounts received pursuant to a consulting agreement between the Company and Dr. Kotzin.

(4) Ms. Sarna served as a director until the 2023 Annual Meeting of Stockholders.

Mr. Mohanty did not receive any additional compensation for his 2023 Board service. The compensation received by Mr. Mohanty for his services to us as our Chief Executive Officer is presented in the 2023 Summary Compensation Table below.

Indemnification Agreements

We have entered into indemnification agreements with our officers and directors. The indemnification agreements and our Bylaws require us to indemnify these individuals to the fullest extent permitted by Delaware law.

Compensation Committee Interlocks

None of the members of our Compensation Committee has at any time during the prior three years been one of our officers or employees. None of our executive officers currently serves, or in the past fiscal year has served, as a member of the board or compensation committee of any entity that has one or more executive officers serving on our Board or Compensation Committee. For more information regarding transactions involving entities affiliated with certain members of the Compensation Committee, please see transactions described under "Certain Relationships and Transactions" in Item 13. Certain Relationships and Related Transactions, and Director Independence.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

Security Ownership of Certain Beneficial Owners and Management

Unless otherwise specified below, the following table presents information regarding beneficial ownership of our common stock as of March 1, 2024 by:

- each stockholder or group of stockholders known by us to be the beneficial owner of more than 5% of our outstanding common stock;
- each of our directors;
- each of our NEOs; and
- all of our current directors and executive officers as a group.

Beneficial ownership is determined in accordance with the rules of the SEC, and thus represents voting or investment power with respect to our securities. Under such rules, beneficial ownership includes any shares over which the individual has sole or shared voting power or investment power as well as any shares that the individual has the right to acquire within 60 days after the date of this table. To our knowledge and subject to applicable community property rules, and except as otherwise indicated below, the persons and entities named in the table have sole voting and sole investment power with respect to all shares beneficially owned.

The percentage ownership information shown in the column titled "Percentage of Shares Beneficially Owned" in the table below is based on 29,336,364 shares of our common stock outstanding as of March 1, 2024 (plus any shares such person has the right to acquire within 60 days after the date of this table). Unless otherwise indicated, the address of each individual listed in this table is the Company's address set forth on the cover of this Annual Report on Form 10-K.

Name and Address of Beneficial Owner	Number of Shares Beneficially Owned	Percentage of Shares Beneficially Owned
Greater than 5% Holders		
Entities affiliated with Athyrium Capital Management, LP[1]	18,333,122	49.90%
Entities affiliated with Davidson Kempner Capital Management[2]	12,687,978	30.19%
Entities affiliated with Highbridge Tactical[3]	6,000,365	17.29%
Named Executive Officers and Directors		
Adi Mohanty[4]	259,296	*
Jeffrey D. Alter[5]	15,725	*
Jeffrey A. Ferrell[1]	18,333,122	49.90%
Jill Howe[6]	12,989	*
Brian L. Kotzin, M.D.[7]	14,925	*
Lynne Powell[8]	14,925	*
Eric d'Esparbes[9]	92,267	*
Clarke Neumann[10]	82,062	*
All current directors and executive officers as a group (8 persons)[11]	18,852,311	50.97%

* Represents beneficial ownership of less than one percent.

(1) Based solely on certain Company records and a Schedule 13D/A filed on December 20, 2023 and includes shares of common stock, shares of common stock issuable upon conversion of the 11.00% / 13.00% Convertible Senior Secured Notes due 2028 (the "11.00% / 13.00% Convertible Notes") and shares underlying certain warrants held by certain affiliates of Athyrium Capital Management, LP ("Athyrium"), and excludes shares underlying the 11.00% / 13.00% Convertible Notes and certain warrants that are subject to certain limitations on the ability on the ability of the holders of such notes or warrants to convert or exercise, applicable, if the holders' beneficial ownership of common stock (together with its affiliates and certain attribution parties) would exceed 49.9% of the outstanding shares of common stock. Consists of (a) 12,958,820 shares of common stock owned by Athyrium Opportunities III Co-Invest 1 LP ("Co-Invest LP"), (b) 671,917 shares of common stock owned by Athyrium Opportunities III Acquisition LP ("Acquisition LP"), (c) 4,519,052 shares of common stock owned by Athyrium Opportunities III Acquisition 2 LP ("Acquisition 2 LP" and, together with Acquisition LP, the "AOIII Acquisition Funds") and (d) 183,333 shares of common stock owned by Athyrium Opportunities 2020 LP ("2020 LP" and, together with Co-Invest LP and the AOIII Acquisition Funds, the "Funds"). Voting and investment power with respect to the shares of the Company's common stock held by the Funds may be deemed to be shared by certain affiliated entities. Athyrium Opportunities Associates III LP ("Associates III LP") is the General Partner of the AOIII Acquisition Funds and 2020 LP. Athyrium Opportunities Associates III GP LLC ("Associates III GP") is the General Partner of Associates III LP. Athyrium Opportunities Associates Co-Invest LLC ("Associates Co-Invest") is the General Partner of Co-Invest LP. Athyrium Funds GP Holdings LLC ("GP Holdings") is the Managing Member of Associates Co-Invest and Associates III GP. Jeffrey A. Ferrell, a member of the Company's Board, serves as the Managing Member of GP Holdings and the President of Associates III GP and Associates Co-Invest, and in his capacity as such, may be deemed to exercise shared voting and investment power over the shares owned by the Funds. Mr. Ferrell and each of the foregoing entities disclaim beneficial ownership of such shares except to the extent of his or its pecuniary interest therein. The business address of each of the above entities and Mr. Ferrell is c/o Athyrium Capital Management, LP, 505 Fifth Avenue, Floor 18, New York, New York 10017.

(2) Based solely on certain Company records. Consists of (a) 1,993,991 shares of common stock underlying certain exercisable warrants and 10,334,820 shares of common stock issuable upon the conversion of the 11.00% / 13.00% Convertible Notes held by Davidson Kempner Arbitrage, Equities and Relative Value LP and (b) 58,090 shares of common stock underlying certain exercisable warrants and 301,077 shares of common stock issuable upon the conversion of the 11.00% / 13.00% Convertible Notes held by M.H Davidson & Co. The business address of such affiliates of Davidson Kempner Capital Management is 520 Madison Avenue, 30th Floor, New York, New York 10022.

(3) Based solely on certain Company records. Consists of (a) 500,000 shares of common stock, 757,728 shares of common stock underlying certain exercisable warrants and 3,542,307 shares of common stock issuable upon the conversion of the 11.00% / 13.00% Convertible Notes held by certain affiliates of Highbridge Tactical Credit Master Fund, L.P and (b) 125,000 shares of common stock, 189,432 shares of common stock underlying certain exercisable warrants and 885,898 shares of common stock issuable upon the conversion of the 11.00% / 13.00% Convertible Notes held by certain affiliates of Highbridge Tactical Credit Institutional Fund, Ltd . The business address of such affiliates of Highbridge Tactical is 277 Park Ave, 23rd Floor, New York, New York, 10172.

(4) Consists of (a) 161,042 shares of common stock and (b) 98,254 shares of common stock underlying options that are exercisable as of the date of this table or will become exercisable within 60 days after such date.

(5) Consists of (a) 6,546 shares of common stock and (b) 9,179 shares of common stock underlying options that are exercisable as of the date of this table or will become exercisable within 60 days after such date.

(6) Consists of (a) 5,381 shares of common stock and (b) 7,608 shares of common stock underlying options that are exercisable as of the date of this table or will become exercisable within 60 days after such date.

(7) Consists of (a) 5,746 shares of common stock and (b) 9,179 shares of common stock underlying options that are exercisable as of the date of this table or will become exercisable within 60 days after such date.

(8) Consists of (a) 5,746 shares of common stock and (b) 9,179 shares of common stock underlying options that are exercisable as of the date of this table or will become exercisable within 60 days after such date.

(9) Consists of (a) 59,012 shares of common stock and (b) 33,255 shares of common stock underlying options that are exercisable as of the date of this table or will become exercisable within 60 days after such date.

(10) Consists of (a) 52,018 shares of common stock and (b) 30,044 shares of common stock underlying options that are exercisable as of the date of this table or will become exercisable within 60 days after such date.

(11) Consists of those shares described in footnotes (1) and (4) through (10) above.

Securities Authorized for Issuance Under Equity Compensation Plans

The following table contains information about our equity compensation plans as of December 31, 2023. As of such date, we had outstanding awards under six equity compensation plans: our 2011 Incentive Stock Plan (the "2011 Plan"),Second Amended and Restated 2012 Stock Plan (the :2012 Plan"), our 2015 Consultant Stock Plan (the "2015 Plan"), our 2018 Plan, our 2020 Employee Stock Purchase Plan ("the "ESPP") and our 2021 Plan.

Plan Category	Number of Securities to Be Issued Upon Exercise of Outstanding Options, Warrants and Rights		Weighted-Average Exercise Price of Outstanding Options, Warrants and Rights	Number of Securities Remaining Available for Future Issuance under Equity Compensation Plans (Excluding Securities Reflected in Column (a))	
	(a)		(b)[1]	(c)	
Equity compensation plans approved by security holders	3,136,913	(2)	$29.16	3,397,586	(3)
Equity compensation plans not approved by security holders	163,456	(4)	$60.13	63,964	(5)
Total	3,300,369		$36.23	3,461,550	

(1) The weighted-average exercise price does not take into account the shares issuable upon vesting of outstanding RSU awards, which have no exercise price.

(2) Consists of stock options to purchase 634,556 shares of our common stock and 2,502,357 RSUs granted under our 2018 Plan, our 2011 Plan, our 2012 Plan and our 2015 Plan.

(3) Represents 3,302,136 shares of our common stock reserved for future grants under our 2018 Plan and 95,450 shares reserved for issuance under our ESPP. Excludes 4,237,838 that were added to our 2018 Plan on January 1, 2024 pursuant to the evergreen provisions thereunder that provide for automatic annual increases on January 1 of each year until January 1, 2030 equal to 4% of our outstanding shares as of the preceding December 31 (or such lesser amounts as approved by the Board). Our ESPP was suspended effective November 6, 2022.

(4) Consists of stock options to purchase 128,456 shares of our common stock and 35,000 RSUs granted under our 2021 Plan.

(5) Represents shares of our common stock reserved for future grants under our 2021 Plan.

Material Features of the 2021 Inducement Plan

On November 3, 2021, the Board approved and adopted the 2021 Plan for the grant of awards to individuals not previously an employee or non-employee director of the Company (or following a bona fide period of non-employment with the Company), as an inducement material to the individual's entry into employment with the Company within the meaning of Rule 5635(c)(4) of the Nasdaq Listing Rules ("Rule 5635(c)(4)"). The Inducement Plan was approved by the independent directors of the Board without stockholder approval pursuant to Rule 5635(c)(4). The Inducement Plan was established with the purpose of helping the Company secure and retain the services of eligible award recipients, provide incentives for such persons to exert maximum efforts for the success of the Company and any affiliate and provide a means by which the eligible recipients may benefit from increases in the value of our common stock. Subject to adjustment for certain changes in our capitalization, the maximum aggregate number of shares that may be issued under the Inducement Plan is 260,000. The Inducement Plan permits the grant of non-statutory stock options, stock appreciation rights, restricted stock, RSUs, performance stock awards and other awards based in whole or part by reference to shares of our common stock.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The following is a summary of each transaction or series of similar transactions since January 1, 2022, or any currently proposed transaction, to which we were or are a party in which:

- the amount involved exceeds $120,000; and
- any related person (including our directors, executive officers, beneficial owners of more than 5% of our common stock, and any members of their immediate family) had or will have a direct or indirect material interest, other than compensation and other arrangements that are described under the section titled "Executive Compensation" or that were approved by our Compensation Committee.

Beneficial ownership of securities is determined in accordance with the rules of the SEC.

Related Party Transactions

Convertible Notes, Securities Purchase Agreement and Warrants

In November 2022, we entered into a securities purchase agreement with affiliates of Athyrium relating to the offering and sale of an aggregate of 500,250 shares of common stock and accompanying warrants to purchase 500,250 shares of common stock, at a combined purchase price of $7.50 per share and accompanying warrant in a registered direct offering. The warrants have an exercise price of $8.22 per share and will become exercisable commencing six months following the date of issuance and will expire five years following the initial exercise date. The Company received approximately $3.75 million in gross proceeds from the offering as an in-kind payment. The in-kind payment was in the form of a waiver of the Company's cash interest payment obligation of approximately $3.75 million due on our 7.25% Convertible Senior Notes due 2025 (the 7.25% Convertible Notes") for the payment date occurring on December 1, 2022. Additionally, the Company agreed with Athyrium to amend outstanding warrants previously issued in 2021 to purchase up to 323,886 shares of common stock with an exercise price of $71.00 per share (the "Amended Warrants"). The Amended Warrants have an amended exercise price of $8.22 per share, will become exercisable on May 9, 2023 and will expire five years following the initial exercise date.

In September 2023, we entered into a convertible notes exchange agreement for common stock and warrants (the "September 2023 Exchange Agreement") with certain affiliates of Athyrium, pursuant to which $50,000,000 aggregate principal amount of the 7.25% Convertible Notes was exchanged for (1) an aggregate of 9,235,281 shares of common stock, (2) pre-funded warrants to purchase an aggregate of 7,399,226 shares of common stock ("September 2023 Pre-Funded Warrants"), (3) warrants to purchase an aggregate of 16,634,507 shares of common stock ("September 2023 Warrants"), and (4) accrued and unpaid interest paid in cash on the 7.25% Convertible Notes exchanged to, but excluding, the closing date. The September 2023 Pre-Funded Warrants have an exercise price of $0.001 per share and are exercisable at any time on or after September 18, 2023 until such September 2023 Pre-Funded Warrants have been fully exercised in accordance with their terms. The September 2023 Warrants have an exercise price of $3.01 per share and are exercisable at any time on or after September 18, 2023 until September 18, 2026. Each of the September 2023 Pre-Funded Warrants and the September 2023 Warrants are subject to certain exercise limitations, including a limitation on the ability to exercise if the holder's beneficial ownership of common stock (together with its affiliates and certain attribution parties) would exceed 49.9% of the outstanding common stock.

In December 2023, we entered into a convertible notes purchase agreement (the "December 2023 Purchase Agreement") with certain affiliates of Athyrium, pursuant to which such affiliates of Athyrium purchased $6,953,000 aggregate principal amount of the 11.00% / 13.00% Convertible Notes and warrants to purchase an aggregate of 2,085,372 shares of common stock (such warrants, "December 2023 Additional Warrants"), which warrants were issued to and are directly held by such affiliates of Athyrium pursuant to the terms of the December 2023 Purchase Agreement, from the Company in exchange for an aggregate of $6,953,000 in interest that had accrued but not yet been paid to such affiliates of Athyrium under the 7.25% Convertible Notes.

In December 2023, we entered into a convertible notes exchange agreement for new notes and warrants (the "December 2023 Exchange Agreement") with certain affiliates of Athyrium, pursuant to which such affiliates of Athyrium exchanged (1) $13,906,000 aggregate principal amount of 7.25% Convertible Notes for $10,430,000 aggregate principal amount of 11.00% / 13.00% Convertible Notes, together with accrued and unpaid interest on the 7.25% Convertible Notes exchanged, and (2) $39,594,000 aggregate principal amount of 7.25% Convertible Notes for warrants to purchase an aggregate of 5,039,236 shares of common stock ("December 2023 Exchange Warrants"), which warrants were issued to and are directly held by such affiliates of Athyrium pursuant to the terms of the December 2023 Exchange Agreement, together with accrued and unpaid interest on the 7.25% Convertible Notes exchanged. All accrued and unpaid interest on 7.25% Convertible Notes exchanged pursuant to the December 2023 Exchange Agreement was used to pay the purchase price owing pursuant to the December 2023 Purchase Agreement. The 11.00% / 13.00% Convertible Notes are subject to certain limitations on conversion, and limitations on the Company's ability to issue common stock to satisfy obligations under the 11.00% / 13.00% Convertible Notes, including a limitation on the ability of the holder to convert or the Company to issue common stock if the holder's beneficial ownership of common stock (together with its affiliates and certain attribution parties) would, in the case of Acquisition LP and Co-Invest LP, exceed 49.9% of the outstanding common stock. The December 2023 Additional Warrants have an exercise price of $5.00 per share and are exercisable at any time on or after December 19, 2023 until December 19, 2028. The December 2023 Exchange Warrants have an exercise price of $5.50 per share and are exercisable at any time on or after December 19, 2023 until December 19, 2028. Each of the December 2023 Additional Warrants and the December 2023 Exchange Warrants are subject to certain exercise limitations, including a limitation on the ability to exercise if the holder's beneficial ownership of common stock (together with its affiliates and certain attribution parties) would exceed 49.9% of the outstanding common stock.

In December 2023, we entered into a convertible notes purchase agreement with entities affiliated with Davidson Kempner Capital Management ("DK"), pursuant to which DK purchased $6,842,000 aggregate principal amount of the 11.00% / 13.00% Convertible Notes, Additional Warrants to purchase an aggregate of 2,052,081 shares of common stock and warrants to purchase an aggregate of 5,030,882 shares of common stock (such warrants, "December 2023 Commitment Warrants"). The December 2023 Commitment Warrants have an exercise price of $1.36 per share and are exercisable at any time on or after December 19, 2023 until December 19, 2028. Additionally, as part of the December 2023 Exchange Agreement, we entered into the agreement with certain

affiliates of DK, pursuant to which such affiliates of DK exchanged $13,000,000 aggregate principal amount of 7.25% Convertible Notes for $9,750,000 aggregate principal amount of 11.00% / 13.00% Convertible Notes.

In December 2023, we entered into a convertible notes purchase agreement with entities affiliated with Highbridge Tactical ("Highbridge"), pursuant to which Highbridge purchased $3,158,000 aggregate principal amount of the 11.00% / 13.00% Convertible Notes, December 2023 Additional Warrants to purchase an aggregate of 947,160 shares of common stock and December 2023 Commitment Warrants to purchase an aggregate of 2,322,059 shares of common stock. Additionally, as part of the December 2023 Exchange Agreement, we entered into the agreement with certain affiliates of Highbridge, pursuant to which such affiliates of Highbridge exchanged $6,000,000 aggregate principal amount of 7.25% Convertible Notes for (1) $3,750,000 aggregate principal amount of 11.00% / 13.00% Convertible Notes and (2) 625,000 shares of common stock.

In November 2022, we entered into a securities purchase agreement with Armistice Capital Master Fund Ltd. (together with its affiliates, "Armistice") relating to the offering and sale of an aggregate of 800,000 shares of common stock and accompanying warrants to purchase 800,000 shares of common stock, at a combined purchase price of $7.50 per share and accompanying warrant in a registered direct offering. Following this transaction, Armistice became a related party due to greater than 5% ownership. On January 12, 2023, the Company issued warrants to purchase 90,000 shares of common stock to Armistice in exchange for Armistice's agreement to waive the lockup provisions contained in the November 2022 offering securities purchase agreement. The warrant has an exercise price of $8.22, is exercisable beginning on May 9, 2023 and expires on May 9, 2028.

Fourth Amended and Restated Investors' Rights Agreement

We are party to a fourth amended and restated investors' rights agreement, effective as of August 27, 2019, as amended, which provides certain holders of our capital stock, including funds managed by Athyrium, with certain registration rights, including the right to demand that we file a registration statement or request that their shares be covered by a registration statement that we are otherwise filing. The registration of shares of the Company's common stock pursuant to the exercise of registration rights described below would enable holders to sell these shares without restriction under the Securities Act of 1933, as amended (the "Securities Act") when the registration statement is declared effective. We will pay all expenses related to any demand, piggyback, or Form S-3 registration described below, with the exception of underwriting discounts and commissions. The registration rights described below will expire (i) five years after the completion of the Company's initial public offering, (ii) with respect to any particular holder, at the time that such holder can sell all its registrable securities under Rule 144 or another similar exemption under the Securities Act without limitation during a three-month period without registration or (iii) upon termination of the fourth amended and restated investors' rights agreement.

Demand Registration Rights

At any time beginning on January 14, 2021, the holders of 50% or more of the registrable securities then outstanding may make a written request that we register all or a portion of their shares, subject to certain specified exceptions. Such request for registration must cover securities with an aggregate offering price, net of underwriting discounts and commissions, of at least $20,000,000. We will prepare and file a registration statement as requested, unless, in the good faith judgment of the Board, such registration would be seriously detrimental to the Company and its stockholders and filing should be deferred. We may defer only once in any 12-month period, and such deferral shall not exceed 120 days after receipt of the request. In addition, we are not obligated to effect more than two of these registrations within any 12-month period or if the holders' proposed registered securities may be immediately registered on Form S-3.

Piggyback Registration Rights

Subject to certain specified exceptions, if we propose to register any of the Company's securities under the Securities Act either for the Company's own account or for the account of other stockholders, the holders of shares having registration rights are entitled to written notice and certain "piggyback" registration rights allowing them to include their shares in the Company's registration statement. These registration rights are subject to specified conditions and limitations, including the right of the underwriters, in their sole discretion, to limit the number of shares included in any such offering under certain circumstances, but not below 15% of the total amount of securities included in such offering, unless all other securities, other than the Company's securities, are entirely excluded from the offering.

Form S-3 Registration Rights

At any time after we are qualified to file a registration statement on Form S-3, and subject to limitations and conditions, the holders of 50% or more of the registrable securities then outstanding are entitled to written notice of such registration and may make a written request that we prepare and file a registration statement on Form S-3 under the Securities Act covering their shares, so long as the aggregate price to the public, net of the underwriters' discounts and commissions, is at least $10,000,000. We will prepare and file the Form S-3 registration as requested, unless, in the good faith judgment of the Board, such registration would be seriously

detrimental to the Company and its stockholders and filing should be deferred. We may defer only once in any 12-month period, and such deferral shall not exceed 120 days after receipt of the request. In addition, we are not obligated to prepare or file any of these registration statements: (i) within 180 days after the effective date of a registration statement pursuant to demand or piggyback registration rights or (ii) if two of these registrations have been completed within any 12-month period.

Registration Rights for Shares of Common Stock Issuable Upon Conversion of Notes

In connection with the issuance of the 7.25% Convertible Notes, we entered into an amendment to the registration rights agreement with certain entities affiliated with Athyrium pursuant to which certain entities affiliated with Athyrium acquired rights to cause us to register the resale of shares of common stock issuable upon conversion of the 7.25% Convertible Notes.

Investment in Enumera Molecular, Inc.

In May 2022, we completed the divesture of our single-molecule detection platform. Under the terms of the agreements, we contributed intellectual property and fixed assets related to the single-molecule detection platform to a newly-formed entity, Enumera Molecular, Inc. ("Enumera"), which intends to develop and commercialize the platform. Enumera was formed by and is affiliated with Dr. Matthew Cooper, our former Chief Scientific Officer, who owned approximately 10% of the equity interests of Enumera on a fully diluted basis immediately following the consummation of the transaction. Upon the consummation of the transaction, the Company received 6,000,000 shares of Series A-1 preferred stock of Enumera with an estimated value of $6.0 million in exchange for the contributed assets, representing 25% minority ownership in Enumera on a fully-diluted basis. In March 2024 we sold all of our ownership interest in Enumera.

Related Party Transaction Policy

We have adopted a written related party transaction policy that sets forth our procedures for the identification, review, consideration and approval or ratification of related person transactions. For purposes of our policy, a related person transaction is a transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships, in which we and any related person (as defined above) are, were or will be participants in which the amount involved exceeds $100,000. Transactions involving compensation for services provided to us as an employee or director, among other limited exceptions, are deemed to have standing pre-approval by the Audit Committee but may be specifically reviewed if appropriate in light of the facts and circumstances.

Under the policy, if a transaction has been identified as a related party transaction, including any transaction that was not a related party transaction when originally consummated or any transaction that was not initially identified as a related party transaction prior to consummation, our management must present information regarding the related party transaction to our Audit Committee for review, consideration and approval or ratification. The presentation must include a description of, among other matters, the material facts, the interests, direct and indirect, of the related persons, the benefits to us of the transaction and whether the transaction is on terms that are comparable to the terms available to or from, as the case may be, an unrelated third party or to or from employees generally. Under the policy, we will collect information that we deem reasonably necessary from each director, executive officer and, to the extent feasible, significant stockholder to enable us to identify any existing or potential related party transactions and to effectuate the terms of the policy. In addition, under our Code of Business Conduct and Ethics, our employees and directors have an affirmative responsibility to disclose any transaction or relationship that reasonably could be expected to give rise to a conflict of interest. In considering related party transactions, our Audit Committee will take into account the relevant available facts and circumstances including, but not limited to:

- the risks, costs and benefits to us;
- the impact on a director's independence in the event that the related person is a director, immediate family member of a director or an entity with which a director is affiliated;
- the availability of other sources for comparable services or products; and
- the terms available to or from, as the case may be, unrelated third parties or to or from employees generally.

The policy requires that, in determining whether to approve, ratify, or reject a related party transaction, our Audit Committee consider, in light of known circumstances, whether the transaction is in, or is not inconsistent with, our best interests and those of our stockholders, as our Audit Committee determines in the good faith exercise of its discretion.

Certain related party transactions described above were consummated prior to our adoption of the formal, written policy described above, and, accordingly, the foregoing policies and procedures were not followed with respect to these transactions. However, we believe that the terms obtained or consideration that we paid or received, as applicable, in connection with the

transactions described below were comparable to terms available or the amounts that would be paid or received, as applicable, in arm's-length transactions at such time.

Director Independence

Nasdaq listing rules require a majority of a listed company's board of directors to be comprised of independent directors who, in the opinion of the board of directors, do not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. Subject to specified exceptions, each member of a listed company's audit, compensation and nominating committees must be independent, and audit and compensation committee members must satisfy additional independence criteria under the Securities Exchange Act of 1934, as amended (the "Exchange Act").

Our Board undertook a review of its composition and the independence of each director. Based upon information requested from and provided by each director concerning his or her background, employment and affiliations, including the beneficial ownership of our capital stock by each non-employee director, our Board has determined that Messrs. Alter and Ferrell, Dr. Kotzin and Mses. Howe and Powell qualify as "independent directors" as defined by the Nasdaq listing rules. Surbhi Sarna, our former director, was determined to be independent during the period she served on the Board in 2023. Mr. Mohanty is deemed not to be independent by virtue of his employment with the Company.

Our Board also determined that each of the directors currently serving on the Audit Committee and the Compensation Committee satisfy the additional independence criteria applicable to directors on such committees under Nasdaq listing rules and the rules and regulations established by the SEC.

In determining that Dr. Kotzin qualifies as an "independent director" as defined by the Nasdaq listing rules and satisfies the heightened independence standards for compensation committees, the Board took into consideration a consulting agreement between Dr. Kotzin and the Company pursuant to which Dr. Kotzin is eligible to receive up to $15,000 per year, which the Board determined did not affect his independence.

Item 14. Principal Accountant Fees and Services.

Our independent registered public accounting firm is KPMG LLP, San Diego, CA, Auditor Firm ID: 185.

Audit Fees and Services

KPMG has served as our independent auditor since 2011. The following table summarizes the audit fees billed and expected to be billed by KPMG for the indicated fiscal years and the fees billed by KPMG for all other services rendered during the indicated fiscal years. All services associated with such fees were by our Audit Committee in accordance with the Policies and Procedures" described below.

	Year Ended December 31,	
Fee Category	**2023**	**2022**
Audit Fees[1]	$ 1,430,000	$ 1,450,000
Audit-Related Fees[2]	—	—
Tax Fees[3]	657,511	536,119
All Other Fees[4]	—	—
Total Fees	$ 2,087,511	$ 1,986,119

(1) Consists of aggregate fees billed for professional services related to the audit of our annual consolidated financial statements, review of our quarterly condensed consolidated financial statements and professional consultations with respect to accounting matters. Also includes services provided in connection with SEC filings, including consents and comment and comfort letters.
(2) Consists of fees for assurance and related services reasonably related to the performance of the audit or review of our financial statements.
(3) Consists of fees for professional services for tax compliance, tax advice and tax planning.
(4) Consists of fees for all other services.

Pre-Approval Policies and Procedures

Our Audit Committee has adopted procedures requiring the pre-approval of all audit and non-audit services performed by our independent auditor in order to assure that these services do not impair the auditor's independence. These procedures generally approve the performance of specific services subject to a cost limit for all such services. This general approval is reviewed, and if necessary modified, at least annually. Management must obtain the specific prior approval of the committee for each engagement of our auditor to perform other audit-related or other non-audit services. The committee does not delegate its responsibility to approve services performed by our auditor to any member of management. The committee has delegated authority to the committee chair to pre-approve any audit or non-audit service to be provided to us by our auditor provided that the fees for such services do not exceed $100,000. Any approval of services by the committee chair pursuant to this delegated authority must be reported to the committee at its next regularly scheduled meeting.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a) 1. FINANCIAL STATEMENTS

Reference is made to the Index to Financial Statements under Item 8, Part II hereof.

2. FINANCIAL STATEMENT SCHEDULES

The financial statement schedules have been omitted either because they are not required or because the information has been included in the consolidated financial statements or the notes thereto included in this annual report.

3. EXHIBITS

EXHIBIT NUMBER	DESCRIPTION
3.1	Eighth Amended and Restated Certificate of Incorporation of the registrant (filed with the SEC as Exhibit 3.1 to the registrant's Form 8-K filed on June 26, 2020).
3.2	Certificate of Amendment of the Eighth Amended and Restated Certificate of Incorporation of the registrant, effective April 26, 2022 (filed with the SEC as Exhibit 3.1 to the registrant's Form 8-K filed on April 27, 2022).
3.3	Second Certificate of Amendment of the Eighth Amended and Restated Certificate of Incorporation of registrant (filed with the SEC as Exhibit 3.1 to the registrant's Form 8-K filed on December 30, 2022).
3.4	Certificate of Designation for Series X Preferred Stock (filed with the SEC as Exhibit 3.1 to the registrant's Form 8-K filed on November 28, 2022).
3.5	Certificate of Elimination of Series X Preferred Stock (filed with the SEC as Exhibit 3.1 to the registrant's Form 8-K filed on January 9, 2023).
3.6	Third Amended and Restated Bylaws of the registrant (filed with the SEC as Exhibit 3.2 to the registrant's Form 8-K filed on November 28, 2022).
4.1	Form of common stock certificate of the registrant (filed with the SEC as Exhibit 4.1 to the registrant's Form S-1/A filed on June 4, 2020).
4.2	Fourth Amended and Restated Investors' Rights Agreement, dated as of August 27, 2019, by and among Progenity, Inc. and certain of its stockholders (filed with the SEC as Exhibit 4.5 to the registrant's Form S-1 filed on May 27, 2020).
4.3	Amendment No. 1 to Fourth Amended and Restated Investors' Rights Agreement, dated as of November 10, 2020, by and among Progenity, Inc., and certain of its stockholders (filed with the SEC as Exhibit 4.6 to the registrant's Form S-1 filed on November 30, 2020).
4.4	Amendment No. 2 to Fourth Amended and Restated Investors' Rights Agreement, dated as of December 7, 2020, by and among Progenity, Inc., and certain of its stockholders (filed with the SEC as Exhibit 4.7 to the registrant's Form 10-K filed on March 18, 2021).
4.5	Amendment No. 3 to Fourth Amended and Restated Investors' Rights Agreement, dated as of May 31, 2021, by and among Progenity, Inc., and certain of its stockholders (filed with the SEC as Exhibit 4.3 to the registrant's Form 10-Q filed on August 12, 2021).
4.6	Amendment No. 4 to Fourth Amended and Restated Investors' Rights Agreement, dated September 18, 2023, by and among Biora Therapeutics, Inc., and certain of its stockholders (filed with the SEC as Exhibit 4.3 to the registrant's Form 8-K filed on September 19, 2023).
4.7	Indenture, dated as of December 7, 2020, between Progenity, Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee (filed with the SEC as Exhibit 4.1 to the registrant's Form 8-K filed on December 7, 2020).
4.8*	First Supplemental Indenture, dated as of December 19, 2023, between Biora Therapeutics, Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee.
4.9*	Second Supplemental Indenture, dated as of March 12, 2024, between Biora Therapeutics, Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee.
4.10	Form of certificate representing the 7.25% Convertible Senior Notes due 2025 (filed with the SEC as Exhibit 4.1 to the registrant's Form 8-K filed on December 7, 2020).
4.11	Form of Warrant (filed with the SEC as Exhibit 4.1 to the registrant's Form 8-K filed on February 25, 2021).
4.12	Form of Warrant (filed with the SEC as Exhibit 4.1 to the registrant's Form 8-K filed on June 14, 2021).
4.13	Form of Warrant (filed with the SEC as Exhibit 4.1 to the registrant's Form 8-K filed on August 23, 2021).
4.14	Form of Pre-Funded Warrant (filed with the SEC as Exhibit 4.2 to the registrant's Form 8-K filed on June 14, 2021).
4.15	Form of Warrant (filed with the SEC as Exhibit 10.2 to the registrant's Form 8-K on November 9, 2022).
4.16	Form of Amended Warrant (filed with the SEC as Exhibit 10.3 to the registrant's Form 8-K filed on November 9, 2022).
4.17	Form of Amended Warrant (filed with the SEC as Exhibit 10.4 to the registrant's Form 8-K filed on November 9, 2022).

4.18	Form of Warrant (filed with the SEC as Exhibit 10.1 to the registrant's Form S-3 filed on January 27, 2023).
4.19	Form of Warrant (filed with the SEC as Exhibit 10.2 to the registrant's Form 8-K filed on June 14, 2023).
4.20	Form of Pre-Funded Warrant (filed with the SEC as Exhibit 4.1 to the registrant's Form 8-K filed on September 19, 2023).
4.21	Form of September 2023 Warrant (filed with the SEC as Exhibit 4.2 to the registrant's Form 8-K filed on September 19, 2023).
4.22	Form of October 2023 Private Placement Warrant (filed with the SEC as Exhibit 4.1 to the registrant's Form 8-K filed on October 11, 2023).
4.23*	Description of Securities.
4.24*	Indenture, dated as of December 19, 2023, between Biora Therapeutics, Inc. and GLAS Trust Company LLC.
4.25*	Supplemental Indenture, dated as of March 12, 2024, between Biora Therapeutics, Inc. and GLAS Trust Company LLC.
4.26	Form of Note (filed with the SEC as Exhibit 4.2 to the registrant's Form 8-K filed on December 18, 2023).
4.27	Form of Exchange Warrant (filed with the SEC as Exhibit 4.3 to the registrant's Form 8-K filed on December 18, 2023).
4.28	Form of Commitment Warrant (filed with the SEC as Exhibit 4.4 to the registrant's Form 8-K filed on December 18, 2023).
4.29	Form of Additional Warrant (filed with the SEC as Exhibit 4.5 to the registrant's Form 8-K filed on December 18, 2023).
4.30	Form of March 2024 Warrant (filed with the SEC as Exhibit 4.4 to the registrant's Form 8-K filed on March 11, 2024).
10.1	Form of Indemnification Agreement for directors and executive officers (filed with the SEC as Exhibit 10.1 to the registrant's Form S-1/A filed on June 4, 2020).
10.2+	Second Amended and Restated 2012 Stock Plan (filed with the SEC as Exhibit 10.2 to the registrant's Form 10-K filed on March 31, 2023).
10.3+	Fifth Amended and Restated 2018 Equity Incentive Plan (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on June 15, 2023).
10.4+	2020 Employee Stock Purchase Plan (filed with the SEC as Exhibit 10.4 to the registrant's Form 10-K filed on March 31, 2023).
10.5+	2021 Inducement Plan (filed with the SEC as Exhibit 10.5 to the registrant's Form 10-K filed on March 31, 2023).
10.6+	Form of 2021 Inducement Plan Stock Option Grant Notice (filed with the SEC as Exhibit 10.6 to the registrant's Form 10-K filed on March 31, 2023).
10.7+	Form of Inducement Plan Stock Option Award Agreement (filed with the SEC as Exhibit 10.7 to the registrant's Form 10-K filed on March 31, 2023).
10.8+	Form of Inducement Plan RSU Grant Notice (filed with the SEC as Exhibit 10.8 to the registrant's Form 10-K filed on March 31, 2023).
10.9+	Form of 2021 Inducement Plan RSU Award Agreement (filed with the SEC as Exhibit 10.9 to the registrant's Form 10-K filed on March 31, 2023).
10.10+	Offer Letter by and between Progenity, Inc. and Eric d'Esparbes, dated as of May 1, 2019 (filed with the SEC as Exhibit 10.7 to the registrant's Form S-1 filed on May 27, 2020).
10.11+	Offer Letter by and between Progenity, Inc. and Clarke Neumann, dated as of August 26, 2014 (filed with the SEC as Exhibit 10.10 to the registrant's Form S-1 filed on May 27, 2020).
10.12+	Offer Letter by and between Progenity, Inc. and Adi Mohanty, dated as of October 30, 2021 (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on November 9, 2021).
10.13+	Severance Plan (filed with the SEC as Exhibit 10.14 to the registrant's Form S-1/A filed on June 4, 2020).
10.14	Stipulation and Order of Settlement and Dismissal, effective July 23, 2020, among the U.S. Department of Justice through the U.S. Attorney's Office for the Southern District of New York, and on behalf of the Office of Inspector General of the Department of Health and Human Services, and with the relator named therein and Progenity, Inc. (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on July 24, 2020).
10.15	Settlement Agreement, effective July 23, 2020, among the United States of America, acting through the U.S. Department of Justice through the U.S. Attorney's Office for the Southern District of California, and on behalf of the Defense Health Agency, the Tricare Program and the Office of Personnel Management, which administers the Federal Employees Health Benefits Program, and Progenity, Inc. (filed with the SEC as Exhibit 10.2 to the registrant's Form 8-K filed on July 24, 2020).
10.16	Promissory Note issued pursuant to the Settlement Agreement, dated July 21, 2020, among the United States of America, acting through the U.S. Department of Justice through the U.S. Attorney's Office for the Southern District of California, and on behalf of the Defense Health Agency, the Tricare Program and the Office of Personnel Management, which administers the Federal Employees Health Benefits Program, and Progenity, Inc. (filed with the SEC as Exhibit 10.3 to the registrant's Form 8-K filed on July 24, 2020).
10.17	Non-Prosecution Agreement, effective July 21, 2020, between the U.S. Attorney's Office for the Southern District of California and Progenity, Inc. (filed with the SEC as Exhibit 10.4 to the registrant's Form 8-K filed on July 24, 2020).
10.18	Corporate Integrity Agreement, effective July 21, 2020, between the Office of Inspector General of the Department of Health and Human Services and Progenity, Inc. (filed with the SEC as Exhibit 10.5 to the registrant's Form 8-K filed on July 24, 2020).

10.19	Securities Purchase Agreement, dated February 22, 2021, by and between Progenity, Inc. and the Purchasers signatory therein (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on February 25, 2021).
10.20	Securities Purchase Agreement, dated June 9, 2021, by and between Progenity, Inc. and the Purchasers signatory thereto (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on June 14, 2021).
10.21	At Market Issuance Sales Agreement, dated November 22, 2021, by and among Progenity, Inc., B. Riley Securities, Inc., BTIG, LLC, and H.C. Wainwright & Co. LLC (filed with the SEC as Exhibit 1.1 to the registrant's Form 8-K filed on November 22, 2021).
10.22	Securities Purchase Agreement dated November 6, 2022, by and between Biora Therapeutics, Inc. and the Purchasers signatory therein (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on November 9, 2022).
10.23	Letter Agreement, dated November 21, 2022, by and between the Company and SDNY (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on November 23, 2022).
10.24	Form of Securities Purchase Agreement (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on June 14, 2023).
10.25	Convertible Notes Exchange Agreement for Common Stock and Warrants, dated September 18, 2023, by and among Biora Therapeutics, Inc., Athyrium Opportunities III Acquisition LP and Athyrium Opportunities III Co-Invest 1 LP (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on September 19, 2023).
10.26	Purchase and Sale Agreement, dated October 6, 2023, by and among Biora Therapeutics, Inc. and Lynxdx, Inc (filed with the SEC as Exhibit 10.2 to the registrant's Form 10-Q filed on November 13, 2023).
10.27	Form of Note Exchange Agreement, dated December 18, 2023, between the Company and the holders named therein (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on December 18, 2023).
10.28	Form of Note Purchase Agreement, dated December 18, 2023, between the Company and the purchasers named therein (filed with the SEC as Exhibit 10.2 to the registrant's Form 8-K filed on December 18, 2023).
10.29*	Security Agreement, dated as of December 19, 2023, between the Company, as issuer, subsidiaries of the Company, as guarantors, and GLAS Trust Company LLC, as Collateral Agent.
10.30	Form of Registration Rights Agreement, dated as of December 19, 2023, between the Company and the investors named therein (filed with the SEC as Exhibit 10.4 to the registrant's Form 8-K filed on December 18, 2023).
10.31	Form of Note Exchange Agreement, dated March 8, 2024, between the Company and the holder named therein (filed with the SEC as Exhibit 10.1 to the registrant's Form 8-K filed on March 11, 2024).
10.32	Form of Note Purchase Agreement, dated March 8, 2024, between the Company and the purchaser named therein (filed with the SEC as Exhibit 10.2 to the registrant's Form 8-K filed on March 11, 2024).
10.33	Form of Registration Rights Agreement, dated as of March 12, 2024, between the Company and the investor named therein (filed with the SEC as Exhibit 10.4 to the registrant's Form 8-K filed on March 11, 2024).
21.1*	List of subsidiaries.
23.1*	Consent of Independent Registered Public Accounting Firm.
31.1*	Certification of principal executive officer pursuant to Rule 13a-14(a) promulgated under the Securities Exchange Act of 1934.
31.2*	Certification of principal financial officer pursuant to Rule 13a-14(a) promulgated under the Securities Exchange Act of 1934.
32.1†	Certification of principal executive officer and principal financial officer pursuant to 18 U.S.C. Section 1350 and Rule 13a-14(b) promulgated under the Securities Exchange Act of 1934.
97.1*	Biora Therapeutics, Inc. Compensation Recoupment (Clawback) Policy
101.INS	Inline XBRL Instance Document
101.SCH	Inline XBRL Taxonomy Extension Schema with Embedded Linkbases Document
104	Cover Page Interactive Data File (embedded within the Inline XBRL document)

* Filed herewith.
\+ Indicates management contract or compensatory plan.
† Furnished herewith and not deemed to be "filed" for purposes of Section 18 of the Exchange Act, and shall not be deemed to be incorporated by reference into any filing under the Securities Act of 1933, as amended, or the Exchange Act.

Item 16. Form 10-K Summary

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized**.**

Biora Therapeutics, Inc.

Date: April 1, 2024

By: /s/ Aditya P. Mohanty
Aditya P. Mohanty
Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each individual whose signature appears below hereby constitutes and appoints Eric d'Esparbes and Clarke W. Neumann, and each of them, the true and lawful attorneys-in-fact and agents of the undersigned, with full power of substitution and resubstitution, for and in the name, place and stead of the undersigned, to sign in any and all capacities (including, without limitation, the capacities listed below), with respect to this Annual Report on Form 10-K, and any and all amendments thereto, and to file the same, with all exhibits thereto, and all other documents in connection therewith, with the U.S. Securities and Exchange Commission, or the SEC, and hereby grants to such attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and anything necessary to be done to enable Biora Therapeutics, Inc. to comply with the provisions of the Securities Exchange Act of 1934 and all the requirements of the SEC, as fully to all intents and purposes as the undersigned might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their or his substitute, or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Report has been signed below by the following persons on behalf of the Registrant in the capacities and on the dates indicated.

Name	Title	Date
/s/ Aditya P. Mohanty **Aditya P. Mohanty**	Chief Executive Officer (principal executive officer)	April 1, 2024
/s/ Eric d'Esparbes **Eric d'Esparbes**	Chief Financial Officer (principal financial and accounting officer)	April 1, 2024
/s/ Jeffrey Alter **Jeffrey Alter**	Director	April 1, 2024
/s/ Jeffrey Ferrell **Jeffrey Ferrell**	Director	April 1, 2024
/s/ Jill Howe **Jill Howe**	Director	April 1, 2024
/s/ Dr. Brian L. Kotzin **Dr. Brian L. Kotzin**	Director	April 1, 2024
/s/ Lynne Powell **Lynne Powell**	Director	April 1, 2024

Exhibit 4.8

FIRST SUPPLEMENTAL INDENTURE

THIS FIRST SUPPLEMENTAL INDENTURE (this "*Supplemental Indenture*"), dated as of December 19, 2023, is made by and between Biora Therapeutics, Inc. (formerly known as Progenity, Inc.), a Delaware corporation (the "*Company*") and The Bank of New York Mellon Trust Company, N.A., a national banking association, as trustee under the Indenture referred to below (the "*Trustee*").

W I T N E S E T H:

WHEREAS, the Company has heretofore executed and delivered to the Trustee an indenture (the "*Indenture*"), dated as of December 7, 2020, providing for the issuance of 7.25% Convertible Senior Notes due 2025 (the "*Notes*");

WHEREAS, Section 8.02 of the Indenture provides that, with the consent of the Holders of at least a majority in aggregate principal amount of the Notes then outstanding (and, in the case of an amendment, supplement or waiver that affects Notes that are not Affiliate Notes a majority in aggregate principal amount of all Notes then outstanding that are not Affiliate Notes), the Company and the Trustee may amend or supplement the Indenture or the Notes in accordance with such Section 8.02;

WHEREAS, the Holders of at least a majority in aggregate principal amount of the outstanding Notes and a majority in aggregate principal amount of all Notes outstanding that are not Affiliate Notes (the "*Requisite Consent*") have validly tendered, and not withdrawn, their consents to the adoption of certain proposed amendments to the Indenture as set forth in Article I to this Supplemental Indenture (the "*Proposed Amendments*") to be effectuated by this Supplemental Indenture in accordance with the provision of the Indenture, and the Company, having received the Requisite Consent for the Proposed Amendments for the Notes, desires to amend the Indenture as provided in this Supplemental Indenture only in respect to the Notes; and

WHEREAS, the Company has heretofore delivered or is delivering contemporaneously herewith to the Trustee the Officer's Certificate and Opinion of Counsel pursuant to Section 8.06 of the Indenture;

NOW, THEREFORE, in consideration of the foregoing and notwithstanding any provision of the Indenture which, absent this Supplemental Indenture, might operate to limit such action, the parties hereto, intending to be legally bound hereby, agree as follows:

ARTICLE I
AMENDMENTS

SECTION 1.01.Amendment of Provisions. Section 3.09 of the Indenture is hereby amended to replace clause (C) thereof with the following "(C) 11.00%/13.00% Convertible Senior Secured Notes due 2028 of the Company (the "New Notes") in an aggregate principal amount of forty million, eight hundred eighty-three thousand dollars ($40,883,000), together with any paid in kind interest thereon in accordance with the terms thereof" and to add a new clause (D) that reads "additional secured indebtedness that is permitted by Sections 3.09(A)-(E) (other than Section 3.09(B)(ii)) and Section 3.11 of the indenture dated as of December 19, 2023 governing the New Notes."

ARTICLE II
MISCELLANEOUS PROVISIONS

SECTION 2.01. Ratification and Incorporation of Indenture. As supplemented hereby, the Indenture is in all respects ratified and confirmed by the Company, and the Indenture and this Supplemental Indenture shall be read, taken and construed as one and the same instrument. Capitalized terms used herein for which no definition is provided herein shall have the meaning set forth in the Indenture.

SECTION 2.02. Executed in Counterparts. The parties may sign any number of copies of this Supplemental Indenture. Each signed copy shall be an original, but all of them together represent the same agreement.

SECTION 2.03. Governing Law. THIS SUPPLEMENTAL INDENTURE WILL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK.

SECTION 2.04. Waiver of Jury Trial. EACH OF THE COMPANY AND THE TRUSTEE HEREBY IRREVOCABLY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATING TO THIS SUPPLEMENTAL INDENTURE, THE INDENTURE, THE NOTES OR THE TRANSACTIONS CONTEMPLATED HEREBY OR THEREBY.

SECTION 2.05. Severability. In case any provision in this Supplemental Indenture or the Notes is invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions will not in any way be affected or impaired thereby.

SECTION 2.06. Headings. The headings of the Sections of this Supplemental Indenture have been inserted for convenience of reference only, are not to be considered a part of this Supplemental Indenture and shall in no way modify or restrict any of the terms or provisions hereof.

SECTION 2.07. Requisite Consent. To the extent Requisite Consent is determined by a court of competent jurisdiction to have not been validly obtained in accordance with the Indenture or applicable laws, the Proposed Amendments shall not be deemed to have occurred.

SECTION 2.08. Trustee's Disclaimer. The recitals contained herein and the statements made in any Officer's Certificate shall be taken as the statements of the Company, and the Trustee assumes no responsibility for their correctness, and none of the recitals contained herein or the statements made in any Officer's Certificate are intended to or shall be construed as statements made or agreed to by the Trustee. The Trustee makes no representations as to the validity or sufficiency of this Supplemental Indenture or the consequences of the Proposed Amendments provided herein.

[Signature Pages Follow]

IN WITNESS WHEREOF, each party hereto has caused this Supplemental Indenture to be signed in its name and behalf by its duly authorized officer, all as of the day and year first above written.

BIORA THERAPEUTICS, INC.

By: /s/ Eric d'Esparbes
Name: Eric d'Esparbes
Title: Chief Financial Officer

[Signature Page to Supplemental Indenture]

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., as Trustee

By: /s/ Ann Dolezal
Name: Ann Dolezal
Title: Vice President

[Signature Page to Supplemental Indenture]

Exhibit 4.9

SECOND SUPPLEMENTAL INDENTURE

THIS SECOND SUPPLEMENTAL INDENTURE (this "*Supplemental Indenture*"), dated as of March 12, 2024, is made by and between Biora Therapeutics, Inc. (formerly known as Progenity, Inc.), a Delaware corporation (the "*Company*") and The Bank of New York Mellon Trust Company, N.A., a national banking association, as trustee under the Indenture referred to below (the "*Trustee*").

W I T N E S E T H:

WHEREAS, the Company has heretofore executed and delivered to the Trustee an indenture (the "*Indenture*"), dated as of December 7, 2020, providing for the issuance of 7.25% Convertible Senior Notes due 2025 (the "*Notes*"), as supplemented by that certain First Supplemental Indenture, dated as of December 19, 2023;

WHEREAS, Section 8.02 of the Indenture provides that, with the consent of the Holders of at least a majority in aggregate principal amount of the Notes then outstanding (and, in the case of an amendment, supplement or waiver that affects Notes that are not Affiliate Notes a majority in aggregate principal amount of all Notes then outstanding that are not Affiliate Notes), the Company and the Trustee may amend or supplement the Indenture or the Notes in accordance with such Section 8.02;

WHEREAS, the Holders of at least a majority in aggregate principal amount of the outstanding Notes and a majority in aggregate principal amount of all Notes outstanding that are not Affiliate Notes (the "*Requisite Consent*") have validly tendered, and not withdrawn, their consents to the adoption of certain proposed amendments to the Indenture as set forth in Article I to this Supplemental Indenture (the "*Proposed Amendments*") to be effectuated by this Supplemental Indenture in accordance with the provision of the Indenture, and the Company, having received the Requisite Consent for the Proposed Amendments for the Notes, desires to amend the Indenture as provided in this Supplemental Indenture only in respect to the Notes; and

WHEREAS, the Company has heretofore delivered or is delivering contemporaneously herewith to the Trustee the Officer's Certificate and Opinion of Counsel pursuant to Section 8.06 of the Indenture;

NOW, THEREFORE, in consideration of the foregoing and notwithstanding any provision of the Indenture which, absent this Supplemental Indenture, might operate to limit such action, the parties hereto, intending to be legally bound hereby, agree as follows:

ARTICLE I
AMENDMENTS

SECTION 1.01.Amendment of Provisions. Section 3.09 of the Indenture is hereby amended to replace clause (C) thereof with the following "(C) 11.00%/13.00% Convertible Senior Secured Notes due 2028 of the Company (the "New Notes") issued under the Indenture dated as of December 19, 2023, by and between the Company and GLAS Trust Company LLC, as trustee and collateral agent (as it may be amended or supplemented from time to time, the "New Notes Indenture"), together with any paid in kind interest thereon in accordance with the terms thereof" and replace clause (D) thereof with the following: "additional secured indebtedness that is permitted by Sections 3.09(A)-(E) (other than Section 3.09(B)(ii)) and Section 3.11 of the New Notes Indenture."

ARTICLE II
MISCELLANEOUS PROVISIONS

SECTION 2.01. Ratification and Incorporation of Indenture. As supplemented hereby, the Indenture is in all respects ratified and confirmed by the Company, and the Indenture and this Supplemental Indenture shall be read, taken and construed as one and the same instrument. Capitalized terms used herein for which no definition is provided herein shall have the meaning set forth in the Indenture.

SECTION 2.02. Executed in Counterparts. The parties may sign any number of copies of this Supplemental Indenture. Each signed copy shall be an original, but all of them together represent the same agreement.

SECTION 2.03. Governing Law. THIS SUPPLEMENTAL INDENTURE WILL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK.

SECTION 2.04. Waiver of Jury Trial. EACH OF THE COMPANY AND THE TRUSTEE HEREBY IRREVOCABLY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATING TO THIS SUPPLEMENTAL INDENTURE, THE INDENTURE, THE NOTES OR THE TRANSACTIONS CONTEMPLATED HEREBY OR THEREBY.

SECTION 2.05. Severability. In case any provision in this Supplemental Indenture or the Notes is invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions will not in any way be affected or impaired thereby.

SECTION 2.06. Headings. The headings of the Sections of this Supplemental Indenture have been inserted for convenience of reference only, are not to be considered a part of this Supplemental Indenture and shall in no way modify or restrict any of the terms or provisions hereof.

SECTION 2.07. Requisite Consent. To the extent Requisite Consent is determined by a court of competent jurisdiction to have not been validly obtained in accordance with the Indenture or applicable laws, the Proposed Amendments shall not be deemed to have occurred.

SECTION 2.08. Trustee's Disclaimer. The recitals contained herein and the statements made in any Officer's Certificate shall be taken as the statements of the Company, and the Trustee assumes no responsibility for their correctness, and none of the recitals contained herein or the statements made in any Officer's Certificate are intended to or shall be construed as statements made or agreed to by the Trustee. The Trustee makes no representations as to the validity or sufficiency of this Supplemental Indenture or the consequences of the Proposed Amendments provided herein.

[Signature Pages Follow]

IN WITNESS WHEREOF, each party hereto has caused this Supplemental Indenture to be signed in its name and behalf by its duly authorized officer, all as of the day and year first above written.

BIORA THERAPEUTICS, INC.

By: /s/ Eric d'Esparbes
Name: Eric d'Esparbes
Title: Chief Financial Officer

[Signature Page to Supplemental Indenture]

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., as Trustee

By: /s/ April Bradley
Name: April Bradley
Title: Vice President

[Signature Page to Supplemental Indenture]

Exhibit 4.23

DESCRIPTION OF THE REGISTRANT'S SECURITIES REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

The following is a summary of the material terms of our capital stock, as well as other material terms of our eighth amended and restated certificate of incorporation, as amended (our "certificate of incorporation"), and our third amended and restated bylaws (our "bylaws"), and certain provisions of Delaware law. This summary does not purport to be complete and is qualified in its entirety by the provisions of our certificate of incorporation and bylaws, copies of which are filed as exhibits to our Annual Report on Form 10-K, to which this exhibit is also appended.

Our authorized capital stock consists of 164,000,000 shares of common stock, $0.001 par value per share, and 10,000,000 shares of "blank check" preferred stock, $0.001 par value per share.

Common Stock

Our certificate of incorporation authorizes the issuance of up to 164,000,000 shares of our common stock. All outstanding shares of our common stock are validly issued, fully paid and nonassessable, and the shares of our common stock to be issued in connection with this offering will be validly issued, fully paid and nonassessable.

The holders of our common stock are entitled to one vote per share on all matters submitted to a vote of stockholders, and our eighth amended and restated certificate of incorporation does not provide for cumulative voting in the election of directors. The holders of our common stock will receive ratably any dividends declared by our board of directors ("Board") out of funds legally available therefor. In the event of our liquidation, dissolution, or winding-up, the holders of our common stock are entitled to share ratably in all assets remaining after payment of or provision for any liabilities.

Preferred Stock

Our Board may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of our common stock. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring, or preventing a change in our control and may adversely affect the market price of our common stock and the voting and other rights of the holders of our common stock.

Registration Rights

We are party to a fourth amended and restated investors' rights agreement, as amended, which provides that certain holders of our common stock have certain registration rights described below. The registration of shares of our common stock pursuant to the exercise of registration rights described below would enable holders to sell these shares without restriction under the Securities Act when the registration statement is declared effective. We will pay all expenses related to any demand, piggyback, or Form S-3 registration described below, with the exception of underwriting discounts and commissions.

The registration rights described below will expire (i) five years after the completion of our initial public offering, (ii) with respect to any particular holder, at the time that such holder can sell all its registrable securities under Rule 144 or another similar exemption under the Securities Act without limitation during a three-month period without registration or (iii) upon termination of the fourth amended and restated investors' rights agreement, as amended.

Demand Registration Rights

The holders of 50% or more of the registrable securities then outstanding may make a written request that we register all or a portion of their shares, subject to certain specified exceptions. Such request for registration must cover securities with an aggregate offering price, net of underwriting discounts and commissions, of at least $20,000,000. We will prepare and file a registration statement as requested, unless, in the good faith judgment of our Board, such registration would be seriously detrimental to the company and its stockholders and filing should be

deferred. We may defer only once in any 12-month period, and such deferral shall not exceed 120 days after receipt of the request. In addition, we are not obligated to effect more than two of these registrations within any twelve 12-month period or if the holders' proposed registered securities may be immediately registered on Form S-3.

Piggyback Registration Rights

Subject to certain specified exceptions, if we propose to register any of our securities under the Securities Act either for our own account or for the account of other stockholders, the holders of shares having registration rights are entitled to written notice and certain "piggyback" registration rights allowing them to include their shares in our registration statement. These registration rights are subject to specified conditions and limitations, including the right of the underwriters, in their sole discretion, to limit the number of shares included in any such offering under certain circumstances, but not below 15% of the total amount of securities included in such offering, unless all other securities, other than our securities, are entirely excluded from the offering.

Form S-3 Registration Rights

At any time after we are qualified to file a registration statement on Form S-3, and subject to limitations and conditions, the holders of 50% or more of the registrable securities then outstanding are entitled to written notice of such registration and may make a written request that we prepare and file a registration statement on Form S-3 under the Securities Act covering their shares, so long as the aggregate price to the public, net of the underwriters' discounts and commissions, is at least $10,000,000. We will prepare and file the Form S-3 registration as requested, unless, in the good faith judgment of our board of directors, such registration would be seriously detrimental to the company and its stockholders and filing should be deferred. We may defer only once in any 12-month period, and such deferral shall not exceed 120 days after receipt of the request. In addition, we are not obligated to prepare or file any of these registration statements (i) within 180 days after the effective date of a registration statement pursuant to demand or piggyback registration rights or (ii) if two of these registrations have been completed within any 12-month period.

Our Certificate of Incorporation and Our Bylaws

Special Meetings; Action by Written Consent

Under our certificate of incorporation, only a majority of the members of our Board then in office may be able to call special meetings of stockholders and only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders. Under our certificate of incorporation, stockholders will be permitted to take action by written consent with respect to any matter that can be acted upon at a meeting of our stockholders for so long as certain stockholders named therein collectively own more than 50% of our issued and outstanding common stock. In all other circumstances, our certificate of incorporation provides that stockholders may not take any action by written consent in lieu of a meeting. This limit may lengthen the amount of time required to take stockholder actions and would prevent the amendment of our bylaws or removal of directors by our stockholders without holding a meeting of stockholders.

Requirements for Advance Notification of Stockholder Nominations and Proposals

Our bylaws establish advance notice procedures with respect to stockholder proposals and the nomination of candidates for election as directors that specify certain requirements as to the timing, form, and content of a stockholder's notice. Business that may be conducted at an annual meeting of stockholders will be limited to those matters properly brought before the meeting. These provisions may make it more difficult for our stockholders to nominate directors at or bring other matters before our annual meeting.

Election and Removal of Directors

Directors will be elected by a plurality vote. Our Board has the exclusive right to increase or decrease the size of the Board and to fill vacancies on the Board. These provisions prevent stockholders from increasing the size of our Board and filling the resulting vacancies. Directors may be removed with or without cause with the approval of the holders of a majority of our outstanding common stock.

Issuance of Undesignated Preferred Stock

Under our certificate of incorporation, our Board has the authority, without further action by the stockholders, to issue up to 10,000,000 shares of undesignated preferred stock with rights and preferences, including voting rights, designated from time to time by our Board. Depending on the rights and terms of any new series of preferred stock created, rights of existing stockholders could be negatively affected. The existence of authorized but unissued shares of preferred stock enables our Board to make it more difficult to attempt to obtain control of us by means of a merger, tender offer, proxy contest, or otherwise.

Delaware General Corporation Law Section 203

As a Delaware corporation, we are also subject to the anti-takeover provisions of Section 203 of the Delaware General Corporation Law, which prohibits a Delaware corporation from engaging in a business combination specified in the statute with an interested stockholder (as defined in the statute) for a period of three years after the date of the transaction in which the person first becomes an interested stockholder, unless the business combination is approved in advance by a majority of the independent directors or by the holders of at least two-thirds of the outstanding disinterested shares. The application of Section 203 of the Delaware General Corporation Law could also have the effect of delaying or preventing a change of control of us.

Exclusive Forum Selection Clause

Our certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the sole and exclusive forum to the fullest extent permitted by law for: (1) any derivative action or proceeding brought on our behalf; (2) any action asserting a breach of fiduciary duty owed by any director, officer or other employee to us or our stockholders; (3) any action asserting a claim against us or any director or officer or other employee arising pursuant to the Delaware General Corporation Law; (4) any action to interpret, apply, enforce or determine the validity of our amended and restated certificate of incorporation or bylaws; or (5) any other action asserting a claim that is governed by the internal affairs doctrine, shall be the Court of Chancery of the State of Delaware (or another state court or the federal court located within the State of Delaware if the Court of Chancery does not have or declines to accept jurisdiction), in all cases subject to the court's having jurisdiction over indispensable parties named as defendants. In addition, our certificate of incorporation will provide that the federal district courts of the United States will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act but the forum selection provisions will not apply to claims brought to enforce a duty or liability created by the Exchange Act. Although we believe these provisions benefit us by providing increased consistency in the application of Delaware law for the specified types of actions and proceedings, the provisions may have the effect of discouraging lawsuits against us or our directors or officers.

Transfer Agent and Registrar

Equiniti Trust Company, LLC serves as the transfer agent and registrar for our common stock.

Listing

Our common stock is listed on The Nasdaq Global Market under the symbol "BIOR."

Exhibit 4.24

BIORA THERAPEUTICS, INC.,

THE GUARANTORS PARTY HERETO FROM TIME TO TIME

and

GLAS TRUST COMPANY LLC

as Trustee and Collateral Agent

INDENTURE

Dated as of December 19, 2023

11.00% / 13.00 % Convertible Senior Secured Notes due 2028

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INDENTURE, dated as of December 19, 2023, among Biora Therapeutics, Inc., a Delaware corporation, as issuer (the "**Company**"), the Guarantors party hereto from time to time (as defined herein), and GLAS Trust Company LLC, as trustee (in such capacity, the "**Trustee**") and as collateral agent (in such capacity, the "**Collateral Agent**").

Each party to this Indenture (as defined below) agrees as follows for the benefit of the Trustee, the Collateral Agent and for the equal and ratable benefit of the Holders (as defined below) of the Company's 11.00% / 13.00% Convertible Senior Secured Notes due 2028 (the "**Notes**").

Article 1.DEFINITIONS; RULES OF CONSTRUCTION

SECTION 1.01.DEFINITIONS.

"**Additional Interest**" means any interest that accrues on any Note pursuant to **Section 3.04**.

"**Affiliate**" has the meaning set forth in Rule 144 as in effect on the Issue Date.

"**Affiliate Note**" means any Note, which shall initially be a Physical Note, issued under this Indenture to, and initially registered in the name of, an Affiliate of the Company, and any Notes issued in exchange therefor or in substitution thereof; *provided*, *however*, that a Note that is an Affiliate Note will cease to be an Affiliate Note at such time, if any, when such Note ceases to be a Transfer-Restricted Security. For the avoidance of doubt, each Affiliate Note shall be deemed to be a Transfer-Restricted Security until such time until it ceases to be so in accordance with such definition. Neither the Trustee nor the Collateral Agent is under any obligation to determine or inquire whether any Note is an Affiliate Note and may conclusively rely on an Officer's Certificate with respect thereto.

"**Affiliate Transaction**" shall have the meaning specified in **Section 3.13.**

"**Applicable Premium**" means, for any Note to be converted, an amount equal to the lesser of (x) the amount, as of such Conversion Date or date of acceleration (including, without limitation, as a result of the commencement of any insolvency proceeding under any provision of any Bankruptcy Law), of all regularly scheduled interest payments due on such Note on each Interest Payment Date calculated at the Cash Interest Rate occurring after such Conversion Date through and including the Maturity Date and (y) the amount, as of such Conversion Date or date of acceleration (including, without limitation, as a result of the commencement of any insolvency proceeding under any provision of any Bankruptcy Law), of all interest amounts (calculated at the Cash Interest Rate) that would have accrued on such Note had such Note remained outstanding through the second anniversary of such Conversion Date or date of acceleration (including, without limitation, as a result of the commencement of any insolvency proceeding under any provision of any Bankruptcy Law); *provided, however*, that if such Conversion Date or date of acceleration is after a Regular Record Date and on or before the next Interest Payment Date, the Holder of such Note at the Close of Business on such Regular Record Date will, pursuant to **Section 5.02(D)** be entitled, notwithstanding such conversion, to receive, on or, at the Company's election, before such Interest Payment Date, the unpaid interest that would have accrued on such Note to, but excluding, such Interest Payment Date and (A) in the case of clause (x) above, such amount shall be deducted from the Applicable Premium, and (B) in the case of clause (y) above, the Applicable

Premium shall be reduced by the amount of interest that would have accrued on such Note from and including such Conversion Date or date of acceleration through but excluding such Interest Payment Date.

"**Applicable Share Price**" means, (1) in the case of any conversion other than during a Redemption Period, the greater of (x) the Minimum Price and (y) the simple average of the Daily VWAP for the 10 consecutive Trading Days ending on and including the Trading Day immediately preceding the applicable Conversion Date and (2) in the case of a conversion with a Conversion Date during a Redemption Period, the greater of (x) the Minimum Price and (y) the simple average of the Daily VWAP for the 10 consecutive Trading Days ending on and including the Trading Day immediately preceding the Redemption Notice Date, in each case subject to adjustment pursuant to **Section 5.05(A)(vi)**.

"**Asset Sale**" means:

(A) the sale, conveyance, transfer or other Disposition (whether in a single transaction or a series of related transactions) of property or assets outside the ordinary course of business of the Company or any Subsidiary;

(B) any license of Intellectual Property; or

(C) the issuance or sale of Capital Stock (other than director's qualifying shares, shares or interests required to be held by foreign nationals or other third parties to the extent required by applicable law or Disqualified Stock) of any Subsidiary (other than to the Company or another Subsidiary), whether in a single transaction or a series of related transactions,

in each case, *other than*:

(i) a sale, exchange or other Disposition of obsolete, damaged, unnecessary, unsuitable or worn out equipment, or other assets, in the ordinary course of business, or Dispositions of property no longer used, useful or economically practicable or commercially reasonable to maintain in the conduct of the business of the Company and its Subsidiaries, taken as a whole;

(ii) any Disposition that constitutes a Fundamental Change;

(iii) any transaction specifically excluded from the definition of Investment or Restricted Payment or any Permitted Investment (other than as a result of the application of clause (D) or clause (P) of such definition);

(iv) Dispositions between or among the Company and/or its Subsidiaries; *provided*, that the fair market value of Dispositions from the Company and the Guarantors to Subsidiaries that are not Guarantors shall not exceed $50,000 in the aggregate during the term of this Agreement;

(v) any settlement of or payment in respect of any property or casualty insurance claim or any foreclosure, condemnation, expropriation or similar proceeding relating to any property or assets of the Company or any of its Subsidiaries;

(vi) any sale or Disposition deemed to occur in connection with the granting or creation of any Lien;

(vii) issuances of Capital Stock pursuant to benefit plans, employment agreements, equity plans, stock subscription or shareholder agreements, stock ownership plans and other similar plans, policies, contracts or arrangements established in the ordinary course of business or approved by Board of Directors in good faith;

(viii) the lease, assignment, license, sublicense or sublease of any real or personal property (including Intellectual Property) in the ordinary course of business or consistent with industry practice, other than any Material Intellectual Property (or any license thereof) and other than any licenses, sublicenses, leases, subleases or assignments that are exclusive generally or exclusive with respect to any region, geography, field of use or therapeutic indication;

(ix) the surrender or waiver of contract rights or settlement, release or surrender of a contract, tort or other litigation claim in the ordinary course of business;

(x) Dispositions of Investments (including Capital Stock) in joint ventures to the extent required by, or made pursuant to customary buy/sell arrangements between, the joint venture parties set forth in joint venture arrangements and similar binding arrangements of joint ventures;

(xi) the sale, exchange or other Disposition of cash or Cash Equivalents or marketable securities;

(xii) the lapse, abandonment or other Disposition of Intellectual Property (other than Material Intellectual Property) by the Company and its Subsidiaries in the ordinary course of business to the extent not material to the conduct of their businesses, taken as a whole; or

(xiii) the unwinding of any Swap Agreement.

"**Asset Sale Offer**" shall have the meaning specified in **Section 3.12(C).**

"**Authorized Denomination**" means, with respect to a Note, a principal amount thereof equal to $1,000 or any integral multiple of $1.00 in excess thereof.

"**Bankruptcy Law**" means Title 11, United States Code, or any similar U.S. federal or state or non-U.S. law for the relief of debtors.

"**Blended Interest Rate**" means 13.00% per annum.

"**Board of Directors**" means the board of directors of the Company or a committee of such board duly authorized to act on behalf of such board.

"**Business Day**" means any day other than a Saturday, a Sunday or any day on which the Federal Reserve Bank of New York is authorized or required by law or executive order to close or be closed.

"**Capital Lease Obligations**" of any Person means the obligations of such Person to pay rent or other amounts under any lease of (or other arrangement conveying the right to use) real or personal property, or a combination thereof, which obligations are required to be classified and accounted for as capital leases on a balance sheet of such Person under GAAP, and the amount of such obligations shall be the capitalized amount thereof determined in accordance with GAAP.

"**Capitalization Amount**" means, for any Interest PIK Date, an amount per Note equal to, as applicable in accordance with Section 2.05(D), the Stock Amount or the interest accrued on the principal amount of such Note as of the immediately preceding Interest Payment Date (or, if there is no immediately preceding Interest Payment Date, the interest accrued on the Initial Principal Amount) and not paid in cash, calculated at the Blended Interest Rate on the principal amount of such Note for which interest is not paid in cash for the period from, and including, such immediately preceding Interest Payment Date (or, if there is no immediately preceding Interest Payment Date, from, and including, the issue date of such Notes) or such other date from which such Note bears interest as stated on such Note to, but excluding, such Interest PIK Date.

"**Capitalization Method**" shall have the meaning specified in **Section 2.05(D)(i).**

"**Capitalized Principal Amount**" means, for any date, the principal amount per Note equal to the Initial Principal Amount of such Note, as increased on each Interest PIK Date occurring on or prior to such date by the Capitalization Amount for such Interest PIK Date, if any to the extent such Capitalization Amount was paid on such Note using the Capitalization Method.

"**Capital Stock**" of any Person means any and all shares of, interests in, rights to purchase, warrants or options for, participations in, or other equivalents of, in each case however designated, the equity of such Person, but excluding any debt securities convertible into such equity.

"**Cash Equivalents**" means:

(A) (i) cash or (ii) readily marketable obligations issued or directly and fully guaranteed or insured by the United States of America or any agency or instrumentality thereof having maturities of not more than 360 days from the date of acquisition thereof; provided that, in the case of Investments of the type described in clause (ii), the full faith and credit of the United States of America is pledged in support thereof;

(B) corporate debt issued by any Person organized under the laws of any state of the United States of America and rated at least "Prime-2" (or the then equivalent grade) by Moody's or at least "A-2" (or the then equivalent grade) by S&P (or, if at any time neither Moody's nor S&P shall be rating such obligations, an equivalent rating from another nationally recognized statistical rating agency), in each case with maturities of not more than 365 days from the date of acquisition thereof;

(C) time and demand deposits with, or certificates of deposit or bankers' acceptances of, any commercial bank that has combined capital and surplus of at least $500,000,000;

(D) fully collateralized repurchase agreements with a term of not more than 30 days for securities described in clause (A) above (without regard to the limitation on maturity contained in such clause) and entered into with a financial institution satisfying the criteria described in clause (C) above or with any primary dealer and having a market value at the time that such repurchase agreement is entered into of not less than 100% of the repurchase obligation of such counterparty entity with whom such repurchase agreement has been entered into;

(E) commercial paper maturing within 180 days from the date of acquisition thereof and having, at such date of acquisition, the highest credit rating obtainable from Moody's or S&P;

(F) marketable short-term money market and similar liquid funds having a rating of at least P-2 or A-2 from either Moody's or S&P, respectively (or, if at any time neither Moody's nor S&P shall be rating such obligations, an equivalent rating from another nationally recognized statistical rating agency);

(G) securities issued or fully guaranteed by any state, commonwealth or territory of the United States of America or by any political subdivision (including any municipality) or taxing authority of any such state, commonwealth or territory, the securities of which state, commonwealth, territory, political subdivision or taxing authority (as the case may be) are rated at least "A" (or A-1, SP1 or other then equivalent grade) by S&P or at least "A1" (or "Prime-1" or MIG-1 or other then equivalent grade) by Moody's as of the date of acquisition and, in each case, with a maturity of not more than one year from the date of acquisition thereof;

(H) Investments, classified in accordance with GAAP as current assets, in any money market fund, mutual fund, or other investment companies that are registered under the Investment Company Act of 1940, as amended, which are administered by financial institutions that invest solely in one or more of the types of securities described in clauses (A) through (G) above; and

(I) in the case of a Subsidiary incorporated, organized or formed outside the United States, other short-term investments that are analogous to the foregoing, are of comparable credit quality and are customarily used by companies in the jurisdiction of such Subsidiary for cash management purposes.

"**Cash Interest Rate**" means 11.00% per annum.

"**Cash Method**" shall have the meaning specified in **Section 2.05(D)(i)**.

"**Cash Settlement**" shall have the meaning specified in **Section 5.03(A)**.

"**Close of Business**" means 5:00 p.m., New York City time.

"**Code**" means the U.S. Internal Revenue Code of 1986, as amended from time to time.

"**Collateral**" means, collectively, all property of whatever kind and nature, whether now existing or hereafter acquired, pledged or purported to be pledged as collateral or otherwise subject to a security interest or purported to be subject to a security interest under any Collateral Document, excluding in all events Excluded Assets (as defined in the Security Agreement).

"**Collateral Agent**" means the Person named as the "Collateral Agent" in the first paragraph of this Indenture, acting in such capacity, until a successor Collateral Agent shall have become such pursuant to the applicable provisions of this Indenture, and thereafter "Collateral Agent" shall mean or include each Person who is then a Collateral Agent hereunder.

"**Collateral Documents**" means, collectively, the Security Agreement and each other security agreement or pledge agreement (including, without limitation, any mortgages) executed and delivered pursuant to **Section 3.10** to secure any of the Obligations in respect of the Notes.

"**Combination Settlement**" shall have the meaning specified in **Section 5.03(A).**

"**Common Stock**" means the common stock, $0.001 par value per share, of the Company, subject to **Section 5.09**.

"**Company**" means the Person named as such in the first paragraph of this Indenture and, subject to **Article 6**, its successors and assigns.

"**Company Order**" means a written request or order signed on behalf of the Company by one (1) of its Officers and delivered to the Trustee.

"**Contingent Obligations**" means, with respect to any Person, any obligation of such Person guaranteeing any leases, dividends or other obligations that do not constitute Indebtedness ("**primary obligations**") of any other Person (the "**primary obligor**") in any manner, whether directly or indirectly, including any obligation of such Person, whether or not contingent: (a) to purchase any such primary obligation or any property constituting direct or indirect security therefor; (b) to advance or supply funds (i) for the purchase or payment of any such primary obligation or to maintain working capital or equity capital of the primary obligor or otherwise to maintain the net worth or solvency of the primary obligor; or (c) to purchase property, securities or services primarily for the purpose of assuring the owner of any such primary obligation of the ability of the primary obligor to make payment of such primary obligation against loss in respect thereof.

"**Conversion Date**" means, with respect to a Note, the first Business Day on which the requirements set forth in **Section 5.02(A)** to convert such Note are satisfied, subject to **Section 5.03(B)**.

"**Conversion Price**" means, as of any time, an amount equal to (A) one thousand dollars ($1,000) *divided by* (B) the Conversion Rate in effect at such time.

"**Conversion Rate**" initially means 641.02564 shares of Common Stock per $1,000 principal amount of Notes; *provided*, *however*, that the Conversion Rate is subject to adjustment

pursuant to **Article 5**; *provided*, *further*, that whenever this Indenture refers to the Conversion Rate as of a particular date without setting forth a particular time on such date, such reference will be deemed to be to the Conversion Rate immediately after the Close of Business on such date.

"**Conversion Share**" means any share of Common Stock issued or issuable upon conversion of any Note.

"**Corporate Trust Office**" means the office of the Trustee, the Collateral Agent or a Note Agent, as applicable, at which, at any particular time, its corporate trust business in respect of this Indenture is administered, which office as of the Issue Date for purposes of surrender for registration of transfer or exchange or for presentation for payment or repurchase or for conversion only is located at GLAS Trust Company LLC, 3 Second Street, Suite 206, Jersey City, NJ 07311, Attn. TMGUS/Biora Therapeutics, Inc., or the principal corporate trust office of any successor Trustee, Collateral Agent or Note Agent, as applicable (or such other address as such successor Trustee, Collateral Agent or Note Agent, as applicable, may designate from time to time by notice to the Holders and the Company).

"**Covenant Defeasance**" means any defeasance pursuant to, and subject to the terms of, **Section 9.04**.

"**Daily VWAP**" means the per share volume-weighted average price as displayed under the heading "Bloomberg VWAP" on Bloomberg page "BIOR <equity> AQR" (or its equivalent successor if such page is not available) in respect of the period from the scheduled open of trading until the scheduled close of trading of the primary trading session on such Trading Day (or if such volume-weighted average price is unavailable, the market value of one share of the Common Stock on such Trading Day determined, using a volume-weighted average method, by a nationally recognized independent investment banking firm retained for this purpose by the Company). The "**Daily VWAP**" shall be determined without regard to after-hours trading or any other trading outside of the regular trading session trading hours.

"**De-Legending Deadline Date**" means, with respect to any New Money Note, the fifteenth (15th) day after the Free Trade Date of such Note; *provided*, *however*, that if such fifteenth (15th) day is after a Regular Record Date and on or before the next Interest Payment Date, then the De-Legending Deadline Date for such Note will instead be the Business Day immediately after such Interest Payment Date.

"**Default**" means any event that is (or, after notice, passage of time or both, would be) an Event of Default.

"**Depositary**" means The Depository Trust Company or its successor.

"**Depositary Participant**" means any member of, or participant in, the Depositary.

"**Depositary Procedures**" means, with respect to any conversion, transfer, exchange or transaction involving a Global Note or any beneficial interest therein, the rules and procedures of the Depositary applicable to such conversion, transfer, exchange or transaction. For the avoidance of doubt, the Trustee shall have no responsibility for the actions or inactions of the Depositary pursuant to its Depositary Procedures.

"**Disposition**" or "**Dispose**" means the sale, transfer, issuance, license, lease, contribution or other disposition (including any sale and leaseback transaction or any contribution or other transfer in exchange for an Investment), whether in one transaction or in a series of transactions, of any property or assets (including, without limitation, any Capital Stock of the Company or any of its Subsidiaries) by any Person (or the granting of any option or other right to do any of the foregoing), including any sale, assignment, transfer or other disposal, with or without recourse, of any notes or accounts receivable or any rights and claims associated therewith.

"**Disqualified Stock**" means any Capital Stock that, by its terms (or by the terms of any security into which it is convertible, or for which it is exchangeable, in each case at the option of the holder thereof), or upon the happening of any event, matures or is mandatorily redeemable, pursuant to a sinking fund obligation or otherwise, or redeemable at the option of the holder thereof, in whole or in part, on or prior to the date that is 91 days after the date on which the Notes mature (other than, in each case, any provision requiring an offer to purchase such Capital Stock as a result of a change of control, delisting, asset sale or similar provision or any other provision permitting holders to convert such Capital Stock so long as any right of the holders thereof upon the occurrence of a change of control, delisting, asset sale or similar provision shall be subject to the prior repayment in full in cash of the Notes); *provided* that if such Capital Stock are issued pursuant to a plan for the benefit of employees of the Company or any of its Subsidiaries or by any such plan to such employees, such Capital Stock shall not constitute Disqualified Stock solely because it may be required to be repurchased by the Company in order to satisfy applicable statutory or regulatory obligations. The amount of Disqualified Stock deemed to be outstanding at any time for purposes of this Indenture will be the maximum amount that the Company and its Subsidiaries may become obligated to pay upon maturity of, or pursuant to any redemption provisions of, such Disqualified Stock or portion thereof, plus accrued dividends.

"**Ex-Dividend Date**" means, with respect to an issuance, dividend or distribution on the Common Stock, the first date on which shares of the Common Stock trade on the applicable exchange or in the applicable market, regular way, without the right to receive such issuance, dividend or distribution (including pursuant to due bills or similar arrangements required by the relevant stock exchange). For the avoidance of doubt, any alternative trading convention on the applicable exchange or market in respect of the Common Stock under a separate ticker symbol or CUSIP number will not be considered "regular way" for this purpose.

"**Exchange Act**" means the U.S. Securities Exchange Act of 1934, as amended.

"**Exchange Agreements**" means those certain exchange agreements, dated December 18, 2023, providing for the issuance by the Company of $23,930,000 aggregate principal amount of Notes.

"**Exchange Notes**" means Notes issued pursuant to the Exchange Agreements.

"**Excluded Proceeds**" shall mean, with respect to any Disposition of Intellectual Property (i) any royalty or similar payments received by the Company or its Subsidiaries from the counterparty in such Disposition in respect of products sold or commercialized by the Company, any of its Subsidiaries, or any third party, which payments are calculated based on and as a percentage of net sales (or similar metrics) of such products achieved after the applicable

Disposition or other direct or indirect monetization, and (ii) the portion, if any, of an upfront payment or a milestone payment solely to the extent required to be used, and used, to fund a feasibility study or confirmation study, or to the extent required to be used, and used, to fund clinical work or further research and development efforts, in each case related to the applicable Disposition or monetization and which is contemplated or required by the terms of the arrangements providing for such Disposition or monetization.

"**Excluded Subsidiaries**" means all of the following and "Excluded Subsidiary" means any of them:

(1) any Subsidiary (including any regulated entity that is subject to net worth or net capital or similar capital and surplus restrictions) that is prohibited or restricted by applicable Law or by contractual obligation (including in respect of assumed Indebtedness permitted hereunder) existing on the Issue Date (or, with respect to any Subsidiary acquired by the Company or a Subsidiary after the Issue Date (and so long as such contractual obligation was not incurred in contemplation of such acquisition), on the date such Subsidiary is so acquired) from providing a Guarantee or if such Guarantee would require governmental (including regulatory) or third party (other than the Company or any Guarantor or their respective Subsidiaries) consent, approval, license or authorization pursuant to such contractual obligation (unless such consent, approval, license or authorization has been obtained or is received after commercially reasonable efforts to obtain the same),

(2) any Subsidiary with respect to which the Company determines and demonstrates to the satisfaction of the Required Holders in their sole discretion that the burden or cost (including any adverse tax consequences to the Company or any of the Company's Subsidiaries) of providing the Guarantee will outweigh the benefits to be obtained by the Secured Parties therefrom, and

(3) Biora Therapeutics UK Limited, so long as it remains in the process of dissolution and otherwise has no material assets or operations.

Notwithstanding anything to the contrary herein, to the extent a Subsidiary which would otherwise constitute an Excluded Subsidiary by the terms of this Indenture becomes a guarantor in respect of any Indebtedness incurred by the Company or a Guarantor, such Subsidiary shall immediately and automatically cease to constitute an Excluded Subsidiary hereunder and shall comply with Section 3.15 and Section 3.16 within the time periods set forth therein.

"**Existing Convertible Notes**" means the Company's outstanding 7.25% Convertible Senior Notes due 2025 issued pursuant to the Existing Convertible Notes Indenture.

"**Existing Convertible Notes Indenture**" means that certain Indenture, dated as of December 7, 2020, between the Company and The Bank of New York Mellon Company, N.A., as trustee.

"**Fair Market Value**" means the value that would be paid by a willing buyer or licensor to an unaffiliated willing seller or licensee in a transaction not involving distress or necessity of either party, reasonably determined in good faith by (unless otherwise provided in this Indenture) the Board of Directors.

"**Free Trade Date**" means (i) with respect to any New Money Note (other than any Affiliate Notes), the date that is one (1) year after the Original Issue Date of such Note, and (ii) with respect to any Affiliate Note, the date on which such Affiliate Note ceases to be a Transfer-Restricted Security.

"**Freely Tradable**" means, with respect to any New Money Note, that such New Money Note would be eligible to be offered, sold or otherwise transferred pursuant to Rule 144 or otherwise if held by a Person that is not an Affiliate of the Company, and that has not been an Affiliate of the Company during the immediately preceding three (3) months, without any requirements as to volume, manner of sale, availability of current public information or notice under the Securities Act (except that, during the six (6) month period beginning on, and including, the date that is six (6) months after the Original Issue Date of such New Money Note, any such requirement as to the availability of current public information will be disregarded if the same is satisfied at that time); *provided*, *however*, that from and after the Free Trade Date of such New Money Note, such Note will not be "Freely Tradable" unless such New Money Note (x) is not identified by a "restricted" CUSIP or ISIN number; and (y) is not represented by any certificate that bears the Restricted Note Legend. For the avoidance of doubt, whether a New Money Note is deemed to be identified by a "restricted" CUSIP or ISIN number or to bear the Restricted Note Legend is subject to **Section 2.12**.

"**Fundamental Change**" means any of the following events:

(A) a "person" or "group" (within the meaning of Section 13(d)(3) of the Exchange Act), other than the Company or its Wholly Owned Subsidiaries, files any report with the SEC indicating that such person or group has become the direct or indirect "beneficial owner" (as defined below) of shares of the Common Stock representing more than fifty percent (50%) (or, in the case of any Permitted Party or any "group" consisting only of Permitted Parties, seventy percent (70%)) of the voting power of all of the Company's Common Stock;

(B) the consummation of (i) any sale, lease or other transfer, in one transaction or a series of transactions, of all or substantially all of the assets of the Company and its Subsidiaries, taken as a whole, to any Person; or (ii) any transaction or series of related transactions in connection with which (whether by means of merger, consolidation, share exchange, combination, reclassification, recapitalization, acquisition, liquidation or otherwise) all of the Common Stock is exchanged for, converted into, acquired for, or constitutes solely the right to receive, other securities, cash or other property; *provided*, *however*, that any merger, consolidation, share exchange or combination of the Company pursuant to which the Persons that directly or indirectly "beneficially owned" (as defined below) all classes of the Company's common equity immediately before such transaction directly or indirectly "beneficially own," immediately after such transaction, more than fifty percent (50%) of all classes of common equity of the surviving, continuing or acquiring company or other transferee, as applicable, or the parent thereof, in substantially the same proportions vis-à-vis each other as immediately before such transaction will be deemed not to be a Fundamental Change pursuant to this **clause (B)**;

(C) the Company's stockholders approve any plan or proposal for the liquidation or dissolution of the Company; or

(D) the Common Stock ceases to be listed on any of The New York Stock Exchange, The Nasdaq Global Market or The Nasdaq Global Select Market (or any of their respective successors);

provided, *however*, that a transaction or event described in **clause (A)** or **(B)** above will not constitute a Fundamental Change if at least ninety percent (90%) of the consideration received or to be received by the holders of Common Stock (excluding cash payments for fractional shares or pursuant to dissenters rights), in connection with such transaction or event, consists of shares of common stock listed on any of The New York Stock Exchange, The Nasdaq Global Market or The Nasdaq Global Select Market (or any of their respective successors), or that will be so listed when issued or exchanged in connection with such transaction or event, and such transaction or event constitutes a Common Stock Change Event whose Reference Property consists of such consideration.

For the purposes of this definition, (x) any transaction or event described in both **clause (A)** and in **clause (B)(i)** or **(ii)** above (without regard to the proviso in **clause (B)**) will be deemed to occur solely pursuant to **clause (B)** above (subject to such proviso); and (y) whether a Person is a "**beneficial owner**" and whether shares are "**beneficially owned**" will be determined in accordance with Rule 13d-3 under the Exchange Act.

"**Fundamental Change Repurchase Date**" means the date fixed for the repurchase of any Notes by the Company pursuant to a Repurchase Upon Fundamental Change.

"**Fundamental Change Repurchase Notice**" means a notice (including a notice substantially in the form of the "Fundamental Change Repurchase Notice" set forth in **Exhibit A**) containing the information, or otherwise complying with the requirements, set forth in **Section 4.02(F)(i)** and **Section 4.02(F)(ii)**.

"**Fundamental Change Repurchase Price**" means the cash price payable by the Company to repurchase any Note upon its Repurchase Upon Fundamental Change, calculated pursuant to **Section 4.02(D)**.

"**GAAP**" means generally accepted accounting principles in the United States of America as in effect from time to time, including those set forth in the opinions and pronouncements of the Accounting Principles Board of the American Institute of Certified Public Accountants and statements and pronouncements of the Financial Accounting Standards Board or in such other statements by such other entity as approved by a significant segment of the accounting profession. Notwithstanding the foregoing, for purposes of determining compliance with any provision herein, the determination of whether a lease is to be treated as an operating lease or capital lease shall be made without giving effect to any change in accounting for leases pursuant to GAAP resulting from the implementation of proposed Accounting Standards Update (ASU) Leases (Topic 840) issued August 17, 2010, or any successor proposal.

"**Global Note**" means a Note that is represented by a certificate substantially in the form set forth in **Exhibit A**, registered in the name of the Depositary or its nominee, duly executed by the Company and authenticated by the Trustee, and deposited with the Trustee, as custodian for the Depositary.

"**Global Note Legend**" means a legend substantially in the form set forth in **Exhibit B-2**.

"**Guarantee**" means the guarantee by each Guarantor of the Company's obligations under this Indenture, the Notes and the other Notes Documents pursuant to **Article 13**.

"**Guarantor**" means each Person that becomes a Guarantor by executing an amended or supplemental indenture pursuant to **Section 3.15** or **Section 13.03** and, subject to **Section 13.04**, its successors and assigns of the foregoing.

"**Holder**" means a person in whose name a Note is registered on the Registrar's books.

"**Indebtedness**" of any Person means, without duplication, (a) all obligations of such Person for borrowed money, (b) all obligations of such Person evidenced by bonds, debentures, notes or similar instruments, (c) all obligations of such Person under conditional sale or other title retention agreements relating to property acquired by such Person, (d) all obligations of such Person in respect of the deferred purchase price of property or services (excluding accounts payable incurred in the ordinary course of business and not past due by more than 90 days) and have not been paid within 90 days thereof, (e) all Indebtedness of others secured by (or for which the holder of such Indebtedness has an existing right, contingent or otherwise, to be secured by) any Lien on property owned or acquired by such Person, whether or not the Indebtedness secured thereby has been assumed, (f) all guarantees by, and Contingent Obligations of, such Person of Indebtedness of others set forth in clauses (a) through (e) and (g) through (j) of this definition, (g) all Capital Lease Obligations of such Person, (h) all obligations, contingent or otherwise, of such Person as an account party in respect of letters of credit, letters of guaranty or bankers' acceptances; (i) obligations in respect of a Royalty Financing, and (j) net termination obligations under Swap Agreements (other than any such obligations that are settleable at the option of such Person in Capital Stock (other than Disqualified Stock) of the Company); *provided*, *however*, that notwithstanding the foregoing, Indebtedness shall be deemed not to include: (1) Contingent Obligations (other than, for the avoidance of doubt, those described in clause (f) above) incurred in the ordinary course of business and not in respect of borrowed money; (2) deferred or prepaid revenues; (3) purchase price holdbacks in respect of a portion of the purchase price of an asset to satisfy warranty or other unperformed obligations of the respective seller; (4) obligations in respect of non-exclusive time-based in-licenses in the ordinary course of business and consistent with customary industry practices; (5) deferred compensation; (6) trade payables or similar obligations to trade creditors or accrued expenses; or (7) obligations in respect of Preferred Stock that is not Disqualified Stock.

"**Indenture**" means this Indenture, as amended or supplemented from time to time.

"**Initial Principal Amount**" of any Note means the principal amount of such Note at the time of original issuance of such Note.

"**Intellectual Property**" means (a) all compounds, formulations, materials, methods, techniques, trade secrets, copyrights, know-how, data, documentation, regulatory submissions, specifications, and other intellectual property of any kind (whether or not protectable under patent, trademark, copyright, or similar laws) and (b) all patents and patent applications claiming the foregoing, as applicable, and all divisions, continuations and continuations-in-part of such patent

applications, all patents issuing thereon and all reissues, reexaminations and extensions of any of the foregoing patents.

"**Interest Payment Date**" means, with respect to a Note, each June 1 and December 1 of each year, commencing on June 1, 2024 (or commencing on such other date specified in the certificate representing such Note). For the avoidance of doubt, the Maturity Date is an Interest Payment Date.

"**Interest PIK Date**" means each Interest Payment Date with respect to which the Company elects (or is deemed to have elected) or agrees to pay interest accrued on the Notes to, but excluding, such Interest Payment Date by the Capitalization Method pursuant to **Section 2.05(D)** hereof.

"**Investment**" means, with respect to any specified Person, all direct or indirect investments by such specified Person in other Persons (including Affiliates) in the forms of loans (including guarantees of Indebtedness or other Obligations), advances or capital contributions (excluding (i) commission, travel and similar advances to Officers and employees made in the ordinary course of business, (ii) accounts receivable, credit card and debit card receivables, trade credit, advances to customers, (iii) extensions of credit to customers or advances, deposits or payment to or with suppliers, lessors or utilities or for workers' compensation, and (iv) intercompany investments among the Company and its Subsidiaries to finance foreign operations in the form of loans, in each case, that are incurred in the ordinary course of business), or purchases or other acquisitions for consideration of Indebtedness, Capital Stock or other securities. The acquisition by the Company or any Subsidiary of the Company of a Person that holds an Investment in a third Person that was acquired in contemplation of the acquisition of such Person will be deemed to be an Investment by the Company or such Subsidiary in such third Person in an amount equal to the Fair Market Value of the Investments held by the acquired Person in such third Person determined as provided in this Indenture. Except as otherwise provided in this Indenture, the amount of an Investment will be determined at the time the Investment is made and without giving effect to subsequent changes in value but after giving effect (without duplication) to all subsequent reductions in the amount of such Investment as a result of the dividend, distribution, interest payment, return of capital, repayment or disposition thereof for cash, not to exceed the original amount of such Investment.

"**IP Monetization Proceeds**" shall mean any amount recovered, received or otherwise realized by the Company or any of its Subsidiaries in connection with any Disposition or other direct or indirect monetization of Intellectual Property or any related rights, whether in the form of cash, Cash Equivalents, indebtedness, Capital Stock or other equity interests in a Person, provided, that amounts received by the Company in forms other than cash and Cash Equivalents shall constitute IP Monetization Proceeds once reduced to cash or Cash Equivalents (whether through payments, assignment proceeds, or any other means), and whether on account of upfront and milestone payments (whether based on the achievement of regulatory or clinical milestones, time-based milestones, or otherwise), contractual or other revenues or otherwise, in each case including any such assets resulting from, or any sale, lease, sublease, license, sublicense, assignment, disposition or other financing or transfer with respect to, or other monetization of, in each case, directly or indirectly, Intellectual Property (net of any direct legal and accounting costs and fees incurred in connection with such Disposition or monetization and taxes paid or currently

payable as a direct result thereof after taking into account any available tax credits or deductions and any tax-sharing arrangements), other than, in each case, Excluded Proceeds.

"**Issue Date**" means December 19, 2023.

"**Last Reported Sale Price**" of the Common Stock for any Trading Day means the closing sale price per share (or, if no closing sale price is reported, the average of the last bid price and the last ask price per share or, if more than one in either case, the average of the average last bid prices and the average last ask prices per share) of Common Stock on such Trading Day as reported in composite transactions for the principal U.S. national or regional securities exchange on which the Common Stock is then listed. If the Common Stock is not listed on a U.S. national or regional securities exchange on such Trading Day, then the Last Reported Sale Price will be the last quoted bid price per share of Common Stock on such Trading Day in the over-the-counter market as reported by OTC Markets Group Inc. or a similar organization. If the Common Stock is not so quoted on such Trading Day, then the Last Reported Sale Price will be the average of the mid-point of the last bid price and the last ask price per share of Common Stock on such Trading Day from each of at least three (3) nationally recognized independent investment banking firms selected by the Company. Neither the Trustee nor the Conversion Agent will have any duty to determine the Last Reported Sale Price.

"**Lien**" means, with respect to any asset, (A) any mortgage, deed of trust, lien, pledge, hypothecation, encumbrance, charge or security interest in, on or of such asset; (B) the interest of a vendor or a lessor under any conditional sale agreement, capital lease or title retention agreement (or any financing lease having substantially the same economic effect as any of the foregoing), other than an operating lease, relating to such asset; and (C) in the case of securities, any purchase option, call or similar right of a third party with respect to such securities. In no event will a Non-Finance Lease Obligation constitute a Lien.

"**Market Disruption Event**" means, with respect to any date, the occurrence or existence, during the one-half hour period ending at the scheduled close of trading on such date on the principal U.S. national or regional securities exchange or other market on which the Common Stock is listed for trading or trades, of any material suspension or limitation imposed on trading (by reason of movements in price exceeding limits permitted by the relevant exchange or otherwise) in the Common Stock or in any options contracts or futures contracts relating to the Common Stock.

"Material Intellectual Property" means all Intellectual Property that is: (i) necessary for or material to the business of the Company and its Subsidiaries (taken as a whole) and (ii) owned by or exclusively licensed to the Company or any of its Subsidiaries.

"**Maturity Date**" means the earlier to occur of (x) December 19, 2028 and (y) the date that is ninety (90) days prior to the maturity of the Existing Convertible Notes, solely to the extent there are Existing Convertible Notes outstanding in a principal amount equal to or greater than $5,000,000 as of such date.

"**Minimum Price**" means $1.36, which is the "Minimum Price" as defined in the applicable Nasdaq listing rules as in effect and calculated as of the date of the Exchange Agreements and the Purchase Agreements.

"**Net Proceeds**" means, (a) with respect to any Asset Sale (including, for the avoidance of doubt, any Royalty Financing, but excluding any event resulting in IP Monetization Proceeds) by the Company or any of its Subsidiaries, the excess, if any, of (i) the sum of cash and Cash Equivalents received by the Company or such Subsidiary in connection with such transaction (including any cash or Cash Equivalents received by way of deferred payment pursuant to, or by monetization of, a note receivable or otherwise, but only as and when so received, unless, for the avoidance of doubt, any such cash or Cash Equivalents received by monetization is in the form of retained collections that do not constitute purchase price or consideration for the sale or other Disposition of the asset subject to such Asset Sale received by the Company or any of its Subsidiaries for such Asset Sale) over (ii) the sum of (A) all payments on account of any Indebtedness that is secured by the applicable asset by a Lien permitted hereunder and that is required to be repaid (or to establish an escrow for the future repayment thereof) in connection with such transaction, (B) the reasonable and customary out-of-pocket expenses incurred by such Person in connection with such transaction (including, without limitation, appraisals, brokerage, legal, title and recording or transfer tax expenses and commissions and legal, accounting and investment banking fees, sales commissions and other reasonable and customary fees and expenses) paid by such Person to third parties (other than Affiliates), (C) the taxes paid or the Company's good faith and reasonable estimation of income, franchise, sales and other applicable taxes required to be paid as a result of such transaction, and (D) any amount subject to an escrow or provided as a reserve against any liabilities in respect of any indemnification obligations or purchase price adjustment associated with any such Disposition and which are reasonably expected to be paid (*provided* that, to the extent and at any time such amounts are not paid and are released from such escrow or reserve to the Company, such amounts shall constitute Net Proceeds) and (b) in connection with any issuance or sale of Indebtedness by the Company or any of its Subsidiaries, or any issuance or sale of Capital Stock by the Company, the cash proceeds received from such issuance or incurrence, net of the reasonable and customary out-of-pocket expenses incurred by such Person in connection with such transaction, including attorneys' fees, investment banking fees, accountants' fees, underwriting discounts and commissions and other customary fees and expenses actually incurred in connection therewith paid by such Person to third parties (other than Affiliates). In the case of any non-Wholly Owned Subsidiary or joint venture, "Net Proceeds" shall be reduced by the pro rata portion thereof attributable to such minority interests or interests of joint venture partners.

"**New Money Notes**" means any Notes issued under this Indenture pursuant to the Purchase Agreements.

"**Non-Affiliate Legend**" means a legend substantially in the form set forth in **Exhibit B-3**.

"**Non-Finance Lease Obligation**" means a lease obligation that is not required to be accounted for as a finance lease on both the balance sheet and the income statement for financial reporting purposes in accordance with GAAP. To avoid doubt, a straight-line or operating lease shall be considered a Non-Finance Lease Obligation.

"**Note Agent**" means any Registrar, Paying Agent or Conversion Agent.

"**Notes**" means the 11.00% / 13.00% Convertible Senior Secured Notes due 2028 issued by the Company pursuant to this Indenture.

"**Notes Documents**" means this Indenture, the Notes, the Guarantees and the Collateral Documents.

"**Obligations**" means any principal, interest, penalties, fees, indemnifications, reimbursements (including, without limitation, reimbursement obligations with respect to letters of credit and bankers' acceptances), damages and other liabilities payable under the documentation governing any Indebtedness.

"**Offer Amount**" shall have the meaning specified in **Section 3.12(C).**

"**Officer**" means the Chairman of the Board of Directors, the Chief Executive Officer, the President, the Chief Operating Officer, the Chief Financial Officer, the Treasurer, any Assistant Treasurer, the Controller, the Secretary or any Vice-President of the Company.

"**Officer's Certificate**" means a certificate that is signed on behalf of the Company by one (1) of its Officers and that meets the requirements of **Section 11.03**.

"**Open of Business**" means 9:00 a.m., New York City time.

"**Opinion of Counsel**" means an opinion, from legal counsel (including an employee of, or counsel to, the Company or any of its Subsidiaries) acceptable to the Trustee, that meets the requirements of **Section 11.03**, subject to customary qualifications and exclusions.

"**Original Issue Date**" means the Issue Date.

"**Permitted Investments**" means:

(A) (x) Investments by the Company or any Subsidiary in Subsidiaries that are Guarantors; and (y) Investments by the Company or any Guarantor in Subsidiaries that are not Guarantors of cash and Cash Equivalents or other assets (excluding Intellectual Property) in amounts of (i) if for the purpose of financing and otherwise facilitating pre-clinical and clinical programs and studies, up to $2,000,000 in the aggregate during the term of this Agreement; and (ii) for all other purposes, up to $50,000 in the aggregate during the term of this Agreement;

(B) any Investment in cash and Cash Equivalents;

(C) any Investment by the Company or any Subsidiary in a Person, if, as a result of, or in connection with, such Investment: (i) such Person becomes or will become a Subsidiary that is a Guarantor; or (ii) such Person is merged, consolidated or amalgamated with or into, or transfers or conveys all or substantially all of its assets to, or is liquidated into, the Company or any Guarantor;

(D) any Investment made as a result of the receipt of non-cash consideration from an Asset Sale that was made pursuant to and in compliance with **Section 3.12** or from a Disposition of assets not constituting an Asset Sale;

(E) any Investments received in compromise or resolution of (i) obligations of trade creditors or customers that were incurred in the ordinary course of business or consistent with past practice of the Company or any of its Subsidiaries, including pursuant to any plan of reorganization or similar arrangement upon the bankruptcy or insolvency of any trade creditor or customer; or (ii) litigation, arbitration or other disputes;

(F) advances to officers, directors, consultants and employees in the ordinary course of business or consistent with past practice, for travel, entertainment, relocation and analogous ordinary business purposes;

(G) any Investment of the Company or any of its Subsidiaries existing on the Issue Date, and any extension, modification or renewal of such existing Investments, to the extent not involving any additional Investment other than as the result of the accrual or accretion of interest or original issue discount or the issuance of pay-in-kind securities, in each case, pursuant to the terms of such Investments as in effect on the Issue Date; *provided* that the amount of any such Investment may be increased as otherwise permitted under this Indenture;

(H) guarantees of Indebtedness incurred in accordance with **Section 3.09**;

(I) receivables owing to the Company or any of its Subsidiaries, prepaid expenses, and lease, utility, workers' compensation and other pledges and deposits, if created, acquired or entered into in the ordinary course of business;

(J) advances, loans, rebates and extensions of credit (including the creation of receivables and endorsements for collection and deposit) to suppliers, lessors, licensors, licensees, distributors, advisors, hosts, producers, customers and vendors, and performance guarantees, in each case in the ordinary course of business or consistent with past practice;

(K) Investments resulting from the acquisition of a Person otherwise permitted by this Indenture, which Investments at the time of such acquisition were held by the acquired Person and were not acquired in contemplation of the acquisition of such Person;

(L) stock, obligations or securities received in satisfaction of judgments and any renewal or replacement thereof;

(M) to the extent constituting Investments, (i) lease, utility and other similar pledges and deposits, (ii) prepaid expenses, negotiable instruments held for collection and lease, utility and workers' compensation, performance and other similar pledges and deposits, and (iii) guarantees of business obligations owed to landlords, suppliers, customers and licensees of the Company and its Subsidiaries, in each case, in the ordinary course of business;

(N) Investments consisting of earnest money deposits required in connection with a purchase agreement, or letter of intent, or other acquisitions to the extent not otherwise prohibited by this Indenture;

(O) the granting of leases, subleases, non-exclusive licenses or non-exclusive sublicenses to others in the ordinary course of business that do not materially adversely interfere in the business of the Company and its Subsidiaries, taken as a whole, and the rights of such parties set forth in such agreements;

(P) Investments in joint ventures in the ordinary course of business of the Company or any of its Subsidiaries otherwise permitted by this Indenture; and

(Q) Swap Agreements permitted under Section 3.09.

"**Permitted Liens**" means, with respect to any Person:

(A) Liens existing as of the Issue Date;

(B) Liens imposed by law, including carriers', warehousemen's, mechanics', landlords', materialmen's, repairmen's, construction contractors' or other like Liens, in each case for sums not yet overdue for a period of more than 60 days or that are bonded or being contested in good faith by appropriate proceedings;

(C) Liens on any property in favor of domestic or foreign governmental bodies to secure partial, progress, advance or other payment pursuant to any contract or statute, not yet due and payable;

(D) (x) leases, non-exclusive licenses, subleases and non-exclusive sublicenses of real property and other assets in the ordinary course of business which do not materially interfere with the ordinary conduct of the Company's or any of its Subsidiaries' business and other Liens incidental to the conduct of the Company's or any of its Subsidiaries' business which do not in the aggregate materially detract from the value of the property or assets subject thereto or interfere with the ordinary conduct of the Company's or any of its Subsidiaries' business in an material and adverse respect, (y) encumbrances, charges, ground leases, easements (including reciprocal easement agreements), survey exceptions, restrictions, encroachments, protrusions, by-law, regulation, zoning restrictions or reservations of, or rights of others for, licenses, rights of way, sewers, electric lines, telegraph and telephone lines and other similar purposes, or zoning, building codes or other restrictions (including minor defects or irregularities in title and similar encumbrances) as to the use of real properties or Liens incidental to the conduct of the business of the Company and its Subsidiaries or to the ownership of their properties, which do not in the aggregate materially adversely affect the value of said properties or materially impair their use in the operation of the business of the Company and its Subsidiaries, and (z) rights of recapture of unused real property in favor of the seller of such property set forth in customary purchase agreements and related arrangements with any government, statutory or regulatory authority;

(E) Liens arising from UCC financing statement filings (or similar filings in other applicable jurisdictions) regarding operating leases entered into by the Company or any of its Subsidiaries in the ordinary course of business;

(F) Liens arising out of conditional sale, title retention, consignment or similar arrangements for the sale of goods entered into in the ordinary course of business;

(G) Liens securing the Notes and any Guarantee;

(H) Liens securing purchase money Indebtedness, Capital Lease Obligations, synthetic lease obligations and mortgages permitted under this Indenture; *provided* that such Liens do not at any time encumber any property or assets other than the property and assets financed thereby (together with any additions, accessions and improvements thereto and the proceeds or distributions thereof);

(I) Liens on assets or property of the Company or any Subsidiary securing Treasury Management Arrangements or Swap Agreements;

(J) customary Liens on insurance proceeds securing financed insurance premiums in the ordinary course of business;

(K) Liens for taxes, assessments or governmental charges which are not overdue for a period of more than 60 days or which are being contested in good faith by appropriate proceedings if adequate reserves with respect thereto are maintained on the books of such Person in accordance with GAAP;

(L) Liens in favor of the Company or any Subsidiary;

(M) Liens securing Indebtedness permitted under **Section 3.09(B)(xxi)** that are subject to an intercreditor agreement in form and substance acceptable to the Required Holders in their sole discretion;

(N) pledges, deposits or Liens under workmen's compensation laws, payroll taxes, unemployment insurance laws, social security laws or similar legislation, or in connection with bids, tenders, completion guarantees (other than for borrowed money), contracts (other than for borrowed money) or leases, or to secure utilities, licenses, public or statutory obligations, or to secure the performance of bids, trade contracts, government contracts and leases, statutory obligations, surety, stay, indemnity, judgment, customs, appeal or performance bonds, guarantees of government contracts, return-of-money bonds, bankers' acceptance facilities (or other similar bonds, instruments or obligations), obligations in respect of letters of credit, bank guarantees or similar instruments that have been posted to support the same, or as security for contested taxes or import or customs duties or for the payment of rent, or other obligations of like nature, in each case incurred in the ordinary course of business or consistent with past practice;

(O) to the extent constituting a Lien, escrow arrangements securing indemnification obligations in connection with an acquisition of a Person or a disposition that is otherwise permitted under this Indenture;

(P) Liens (i) on advances of cash or Cash Equivalents in favor of the seller of any property to be acquired, which are to be applied against the purchase price for such acquisition; provided that (x) the aggregate amount of such advances shall not exceed the purchase price of such acquisition and (y) the property is acquired within 90 days following the date of the first such advance so made; and (ii) consisting of any agreement, grant or option to sell, transfer or dispose of any property in a disposition of assets, in each case, solely to the

extent such acquisition or disposition, as the case may be, would have been permitted on the date of the creation of such Liens;

(Q) Liens securing or otherwise arising out of judgments, decrees, attachments, garnishments, orders, awards or other forms of levies or injunction not giving rise to an Event of Default so long as (a) any appropriate legal proceedings which may have been duly initiated for the review of such judgment, decree, order or award have not been finally terminated, (b) the period within which such proceedings may be initiated has not expired or (c) no more than 60 days have passed after (i) such judgment, decree, attachment, garnishment, order, award or other form of levy or injunction has become final or (ii) such period within which such proceedings may be initiated has expired;

(R) [reserved]; and

(S) (i) Liens on the assets of Subsidiaries that are not Guarantors securing Indebtedness or other obligations of such Subsidiaries or any other Subsidiaries that are not Guarantors that is permitted by **Section 3.09** or otherwise not prohibited by this Indenture, and (ii) Liens on Capital Stock of joint ventures that are not the Company or a Guarantor (A) securing obligations of such joint venture or (B) pursuant to the relevant joint venture agreement or arrangement.

"**Permitted Party**" means Athyrium Capital Management, LP, Athyrium Opportunities III Co-Invest 1 LP and Athyrium Opportunities III Acquisition LP and each Affiliate of any of them, but excluding in each case any portfolio company of any of the foregoing.

"**Permitted Refinancing Indebtedness**" means any Indebtedness for borrowed money of the Company or its Subsidiaries issued in exchange for, or the Net Proceeds of which are used to renew, refund, refinance, replace, defease or discharge other Indebtedness for borrowed money of the Company or its Subsidiaries; *provided* that: (A) the principal amount (or accreted value, if applicable) of such Permitted Refinancing Indebtedness does not exceed the principal amount (or accreted value, if applicable) of the Indebtedness renewed, refunded, refinanced, replaced, defeased or discharged (plus all accrued interest on the Indebtedness for borrowed money and the amount of all fees and expenses, including premiums, incurred in connection therewith); (B) such Permitted Refinancing Indebtedness has a final maturity date no earlier than either (i) the final maturity date of the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged or (ii) ninety one (91) days after the Maturity Date; (C) such Permitted Refinancing Indebtedness has a Weighted Average Life to Maturity at the time such Permitted Refinancing Indebtedness is incurred that is no shorter than the Weighted Average Life to Maturity of the portion of the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged; (D) if the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged is subordinated in right of payment to the Notes, such Permitted Refinancing Indebtedness is subordinated in right of payment to the Notes on terms at least as favorable to the Holders of Notes as those contained in the documentation governing the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged; (E) such Indebtedness is incurred either by the Company or its Subsidiary that was the obligor on the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged and is guaranteed only by persons who were obligors on the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged; and

(F) is not secured by a Lien on any assets other than the assets securing the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged.

"**Person**" or "**person**" means any individual, corporation, partnership, limited liability company, joint venture, association, joint-stock company, trust, unincorporated organization or government or other agency or political subdivision thereof. Any division or series of a limited liability company, limited partnership or trust will constitute a separate "person" under this Indenture.

"**Physical Note**" means a Note (other than a Global Note) that is represented by a certificate substantially in the form set forth in **Exhibit A**, registered in the name of the Holder of such Note and duly executed by the Company and authenticated by the Trustee.

"**Physical Settlement**" shall have the meaning specified in **Section 5.03(A).**

"**PIK Interest**" means any interest paid pursuant to **Section 2.05(D)** by the Capitalization Method.

"**PIK Notes**" shall have the meaning specified in **Section 2.05(D)(ii).**

"**PIK Payment**" means the payment of any PIK Interest on the Notes.

"**Preferred Stock**" means, with respect to any Person, any Capital Stock with preferential rights to any other Capital Stock of such Person with respect to payment of dividends or preferential rights upon liquidation, dissolution, or winding up.

"**Purchase Agreements**" means those certain Purchase Agreements, dated December 18, 2023, providing for the issuance by the Company of $16,953,000 aggregate principal amount of Notes.

"**Redemption**" means the repurchase of any Note by the Company pursuant to **Section 4.03**.

"**Redemption Date**" means the date fixed, pursuant to **Section 4.03(D)**, for the settlement of the repurchase of any Notes by the Company pursuant to a Redemption.

"**Redemption Notice Date**" means, with respect to a Redemption, the date on which the Company sends the Redemption Notice for such Redemption pursuant to **Section 4.03(F)**.

"**Redemption Period**" means the period from, and including, the relevant Redemption Notice Date until the Close of Business on the Business Day immediately before the Redemption Date.

"**Redemption Price**" means the cash price payable by the Company to redeem any Note upon its Redemption, calculated pursuant to **Section 4.03(E)**.

"**Regular Record Date**" has the following meaning with respect to an Interest Payment Date: (A) if such Interest Payment Date occurs on June 1, the immediately preceding May 15; and

(B) if such Interest Payment Date occurs on December 1, the immediately preceding November 15.

"**Repurchase Upon Fundamental Change**" means the repurchase of any Note by the Company pursuant to **Section 4.02**.

"**Required Holders**" means, at any time of determination, Holders of a majority in aggregate principal amount of both (a) the then outstanding Notes and (b) the then outstanding Notes held by Persons who are not Affiliates of the Company and its Subsidiaries. For the avoidance of doubt, each Permitted Party shall constitute an Affiliate of the Company and its Subsidiaries hereunder.

"**Responsible Officer**" means (A) any officer within the corporate trust administration of the Trustee, the Collateral Agent or Note Agent (or any successor group) customarily performing functions similar to those performed by any of such officers; and (B) with respect to a particular corporate trust matter, any other officer to whom such matter is referred because of his or her knowledge of, and familiarity with, the particular subject, and, in each case, who will have direct responsibility for the administration of this Indenture.

"**Restricted Note Legend**" means a legend substantially in the form set forth in **Exhibit B-1A** (in the case of a Note that is not an Affiliate Note) or **Exhibit B-1B** (in the case of an Affiliate Note).

"**Restricted Payment**" shall have the meaning specified in **Section 3.11.**

"**Restricted Stock Legend**" means, with respect to any Conversion Share, a legend substantially to the effect that the offer and sale of such Conversion Share have not been registered under the Securities Act and that such Conversion Share cannot be sold or otherwise transferred except pursuant to a transaction that is registered under the Securities Act or that is exempt from, or not subject to, the registration requirements of the Securities Act.

"**Royalty Financing**" means any sale of future revenues or synthetic royalty or other financing based on future revenues derived from, and other proceeds arising out of, any product marketed or sold by the Company and its Subsidiaries.

"**Rule 144**" means Rule 144 under the Securities Act (or any successor rule thereto), as the same may be amended from time to time.

"**Rule 144A**" means Rule 144A under the Securities Act (or any successor rule thereto), as the same may be amended from time to time.

"**Scheduled Trading Day**" means any day that is scheduled to be a Trading Day on the principal U.S. national or regional securities exchange on which the Common Stock is then listed or, if the Common Stock is not then listed on a U.S. national or regional securities exchange, on the principal other market on which the Common Stock is then traded. If the Common Stock is not so listed or traded, then "Scheduled Trading Day" means a Business Day.

"**SEC**" means the U.S. Securities and Exchange Commission.

"**Secured Parties**" shall have the meaning specified in the Security Agreement.

"**Securities Act**" means the U.S. Securities Act of 1933, as amended.

"**Security**" means any Note or Conversion Share.

"**Security Agreement**" means that certain Security Agreement, dated as of the date hereof, by and among the Company, the Guarantors party thereto from time to time and the Collateral Agent, as amended, restated, amended and restated, supplemented, modified or replaced, in whole or in part, from time to time, in accordance with its terms.

"**Settlement Method**" means Cash Settlement, Combination Settlement or Physical Settlement.

"**Settlement Notice**" shall have the meaning specified in **Section 5.03(A).**

"**Significant Subsidiary**" means, with respect to any Person, any Subsidiary of such Person that constitutes, or any group of Subsidiaries of such Person that, in the aggregate, would constitute, a "significant subsidiary" (as defined in Rule 1-02(w) of Regulation S-X under the Exchange Act) of such Person.

"**Special Interest**" means any interest that accrues on any Note pursuant to **Section 7.03**.

"**Strategic Investment**" means an equity investment or upfront milestone payment by a Strategic Investor of at least $25.0 million (exclusive of any earnout or future or delayed payments or subsequently committed amounts) that is coupled with a collaboration agreement between the Company and a pharmaceutical company that allows for the use of the Company's Navicap or Biojet technology with that pharmaceutical company's molecule.

"**Strategic Investor**" means a strategic/corporate company doing business in the pharmaceutical, biotech or other life sciences industries.

"**Strategic Make-Whole**" means, for any Note to be converted during a Redemption Period in connection with a Strategic Redemption Event, an amount equal to the amount, as of such Conversion Date, of all interest amounts (calculated at the Cash Interest Rate) that would have accrued on such Note had such Note remained outstanding through the third anniversary of such Conversion Date; *provided, however*, that if such Conversion Date is after a Regular Record Date and on or before the next Interest Payment Date, the Holder of such Note at the Close of Business on such Regular Record Date will, pursuant to **Section 5.02(D)**, be entitled, notwithstanding such conversion, to receive, on or, at the Company's election, before such Interest Payment Date, the unpaid interest that would have accrued on such Note to, but excluding, such Interest Payment Date and the Strategic Make-Whole shall be reduced by the amount of interest that would have accrued on such Note from and including such Conversion Date through but excluding such Interest Payment Date.

"**Strategic Redemption Event**" means any Redemption made prior to the first anniversary of the Issue Date with proceeds from a Strategic Investment of at least $25.0 million.

"**Subordinated Indebtedness**" means, with respect to the Company, any Indebtedness of the Company which (i) is subject to terms and conditions satisfactory to the Required Holders in their sole discretion, (ii) by its terms is expressly and contractually subordinated in right of payment to the Notes pursuant to an intercreditor agreement in form and substance acceptable to the Required Holders in their sole discretion, and (iii) matures no earlier than the date that is 91 days after the Maturity Date.

"**Subsidiary**" means, with respect to any Person, (A) any corporation, association or other business entity (other than a partnership or limited liability company) of which more than fifty percent (50%) of the total voting power of the Capital Stock entitled (without regard to the occurrence of any contingency, but after giving effect to any voting agreement or stockholders' agreement that effectively transfers voting power) to vote in the election of directors, managers or trustees, as applicable, of such corporation, association or other business entity is owned or controlled, directly or indirectly, by such Person or one or more of the other Subsidiaries of such Person; and (B) any partnership or limited liability company where (i) more than fifty percent (50%) of the capital accounts, distribution rights, equity and voting interests, or of the general and limited partnership interests, as applicable, of such partnership or limited liability company are owned or controlled, directly or indirectly, by such Person or one or more of the other Subsidiaries of such Person, whether in the form of membership, general, special or limited partnership or limited liability company interests or otherwise; and (ii) such Person or any one or more of the other Subsidiaries of such Person is a controlling general partner of, or otherwise controls, such partnership or limited liability company. For the avoidance of doubt, Biora Therapeutics UK Limited shall not be deemed a Subsidiary of the Company or any of its Subsidiaries for purposes of this Indenture.

"**Swap Agreement**" means any agreement with respect to any swap, forward, spot, future, credit default or derivative transaction or option or similar agreement involving, or settled by reference to, one or more rates, currencies, commodities, equity or debt instruments or securities, or economic, financial or pricing indices or measures of economic, financial or pricing risk or value or any similar transaction or any combination of these transactions; *provided* that no phantom stock or similar plan providing for payments only on account of services provided by current or former directors, officers, employees or consultants of the Company or its Subsidiaries shall be a Swap Agreement.

"**Trading Day**" means any day on which (A) trading in the Common Stock generally occurs on the principal U.S. national or regional securities exchange on which the Common Stock is then listed or, if the Common Stock is not then listed on a U.S. national or regional securities exchange, on the principal other market on which the Common Stock is then traded; and (B) there is no Market Disruption Event. If the Common Stock is not so listed or traded, then "Trading Day" means a Business Day.

"**Transfer-Restricted Security**" means any Security that constitutes a "restricted security" (as defined in Rule 144); *provided*, *however*, that such Security will cease to be a Transfer-Restricted Security upon the earliest to occur of the following events:

(A)such Security is sold or otherwise transferred to a Person (other than the Company or an Affiliate of the Company) pursuant to a registration statement that was effective under the Securities Act at the time of such sale or transfer;

(B)such Security is sold or otherwise transferred to a Person (other than the Company or an Affiliate of the Company) pursuant to an available exemption (including Rule 144) from the registration and prospectus-delivery requirements of, or in a transaction not subject to, the Securities Act and, immediately after such sale or transfer, such Security ceases to constitute a "restricted security" (as defined in Rule 144); and

(C)such Security is eligible for resale, by a Person that is not an Affiliate of the Company and that has not been an Affiliate of the Company during the immediately preceding three (3) months, pursuant to Rule 144 without any limitations thereunder as to volume, manner of sale, availability of current public information or notice (and, if such Security is an Affiliate Note or a Conversion Share issued upon conversion of an Affiliate Note, the Company has received such certificates or other documentation or evidence, if any, as the Company, may reasonably require to determine that the Holder or beneficial owner of such Affiliate Note or Conversion Share, as applicable, is not, and has not been during the immediately preceding three (3) months, an Affiliate of the Company).

The Exchange Notes (other than any Affiliate Notes) and any Common Stock issued upon conversion of any Exchange Notes (other than any Affiliate Notes) shall not be Transfer-Restricted Securities. Neither the Trustee nor any Note Agent is under any obligation to determine whether any Security is a Transfer-Restricted Security and may conclusively rely on an Officer's Certificate with respect thereto.

"**Treasury Management Arrangement**" means any agreement or other arrangement governing the provision of treasury or cash management services, including, without limitation, deposit accounts, overdraft, overnight draft, credit cards, debit cards, p-cards (including purchasing cards, employee credit card programs and commercial cards), funds transfer, automated clearinghouse, direct debit, zero balance accounts, returned check concentration, controlled disbursement, lockbox, account reconciliation and reporting and trade finance services, netting services, cash pooling arrangements, credit and debit card acceptance or merchant services and other treasury or cash management services.

"**Trust Indenture Act**" means the U.S. Trust Indenture Act of 1939, as amended.

"**Trustee**" means the Person named as such in the first paragraph of this Indenture, acting in such capacity, until a successor replaces it in accordance with the provisions of this Indenture and, thereafter, means such successor.

"**Weighted Average Life to Maturity**" means, when applied to any secured indebtedness for borrowed money at any date, the number of years obtained by dividing: (A) the sum of the products obtained by multiplying (i) the amount of each then remaining installment, sinking fund,

serial maturity or other required payments of principal, including payment at final maturity, in respect of the secured indebtedness for borrowed money, by (ii) the number of years (calculated to the nearest one-twelfth) that will elapse between such date and the making of such payment; by (B) the then outstanding principal amount of such secured indebtedness for borrowed money.

"**Wholly Owned Subsidiary**" of a Person means any Subsidiary of such Person all of the outstanding Capital Stock or other ownership interests of which (other than directors' qualifying shares) are owned by such Person or one or more Wholly Owned Subsidiaries of such Person.

SECTION 1.02.OTHER DEFINITIONS.

Term	Defined in Section
"**Attribution Parties**"	**2.21**
"Beneficial Ownership Limitation"	**2.21**
"**Business Combination Event**"	**6.01(A)**
"**Cash Portion**"	2.05(D)
"**Common Stock Change Event**"	**5.09(A)**
"**Conversion Agent**"	**2.06(A)**
"**Conversion Consideration**"	**5.03(A)**
"**Default Interest**"	**2.05(B)**
"**Defaulted Amount**"	**2.05(B)**
"**Event of Default**"	**7.01(A)**
"**Expiration Date**"	**5.05(A)(v)**
"**Expiration Time**"	**5.05(A)(v)**
"**Fundamental Change Notice**"	**4.02(E)**
"**Fundamental Change Repurchase Right**"	**4.02(A)**
"**Guaranteed Obligations**"	**13(A)(ii)**
"**Guarantor Business Combination Event**"	**13.04(A)**
"**incur**"	**3.09(A)**
"**Initial Notes**"	**2.03(A)**
"Notice of Conversion"	**5.02**
"**Paying Agent**"	**2.06(A)**
"**Permitted Debt**"	**3.09(B)**
"**Redemption Notice**"	**4.03(F)**
"**Reference Property**"	**5.09(A)**
"**Reference Property Unit**"	**5.09(A)**
"**Register**"	**2.06(B)**
"**Registrar**"	**2.06(A)**
"**Reporting Event of Default**"	**7.03(A)**
"**Restricted Investment**"	**3.11(A)**
"**Share Price**"	**6.01(A)(A)**
"**Specified Courts**"	**11.07**
"**Spin-Off**"	**5.05(A)(iii)(2)**
"**Spin-Off Valuation Period**"	**5.05(A)(iii)(2)**
"**Successor Corporation**"	**6.01(A)**
"**Successor Guarantor**"	**13.04(A)**

"**Successor Person**" 5.09(A)
"**Tender/Exchange Offer Valuation Period**" 5.05(A)(v)

SECTION 1.03. RULES OF CONSTRUCTION.

For purposes of this Indenture:

(A) "or" is not exclusive;

(B) "including" means "including without limitation";

(C) "will" expresses a command;

(D) the "average" of a set of numerical values refers to the arithmetic average of such numerical values;

(E) a merger involving, or a transfer of assets by, a limited liability company, limited partnership or trust will be deemed to include any division of or by, or an allocation of assets to a series of, such limited liability company, limited partnership or trust, or any unwinding of any such division or allocation;

(F) words in the singular include the plural and in the plural include the singular, unless the context requires otherwise;

(G) "herein," "hereof" and other words of similar import refer to this Indenture as a whole and not to any particular Article, Section or other subdivision of this Indenture, unless the context requires otherwise;

(H) references to currency mean the lawful currency of the United States of America, unless the context requires otherwise;

(I) the exhibits, schedules and other attachments to this Indenture are deemed to form part of this Indenture; and

(J) the term "**interest**," when used with respect to a Note, includes any Additional Interest and Special Interest, unless the context requires otherwise;

(K) references herein to the "principal" or "principal amount" of any Note shall, in each case, be deemed to refer to the Capitalized Principal Amount of such Note, unless the context otherwise requires;

(L) references herein to any notice, direction, request or other communication to be delivered or provided to the Trustee, the Collateral Agent or any Note Agent shall mean a notice, direction, request or other communication that is provided in writing.

Article 2.THE NOTES

SECTION 2.01.FORM, DATING AND DENOMINATIONS.

The Notes and the Trustee's certificate of authentication will be substantially in the form set forth in **Exhibit A**. The Notes will bear the legends required by **Section 2.09** and may bear notations, legends or endorsements required by law, stock exchange rule or usage or the Depositary. Each Note will be dated as of the date of its authentication.

Except to the extent otherwise provided in a Company Order delivered to the Trustee in connection with the issuance and authentication thereof, the Notes will be issued initially in the form of one or more Global Notes; *provided*, *however*, that each Affiliate Note will be issued initially in the form of one or more Physical Notes. Global Notes may be exchanged for Physical Notes, and Physical Notes may be exchanged for Global Notes, only as provided in **Section 2.10**. The Exchange Notes and the New Money Notes, in each case other than any such Notes constituting Affiliate Notes, will be issued initially in the form of separate Global Notes, with the New Money Notes initially bearing the Restricted Note Legend.

The Notes will be issuable only in registered form without interest coupons and only in Authorized Denominations.

Each certificate representing a Note will bear a unique registration number that is not affixed to any other certificate representing another outstanding Note.

The Notes shall be subject in all respects to the terms of this Indenture, and to the extent that any provision of any Note conflicts with the provisions of this Indenture, the provisions of this Indenture will control for purposes of this Indenture and such Note.

SECTION 2.02.EXECUTION, AUTHENTICATION AND DELIVERY.

(A)*Due Execution by the Company*. At least one (1) duly authorized Officer will sign the Notes on behalf of the Company by manual or electronic signature. A Note's validity will not be affected by the failure of any Officer whose signature is on any Note to hold, at the time such Note is authenticated, the same or any other office at the Company.

(B)*Authentication by the Trustee and Delivery*.

(i) No Note will be valid until it is authenticated by the Trustee. A Note will be deemed to be duly authenticated only when an authorized signatory of the Trustee (or a duly appointed authenticating agent) manually or electronically signs the certificate of authentication of such Note.

(ii) The Trustee will cause an authorized signatory of the Trustee (or a duly appointed authenticating agent) to manually or electronically sign the certificate of authentication of a Note only if (1) the Company delivers such Note to the Trustee; (2) such Note is executed by the Company in accordance with **Section 2.02(A)**; and (3) the Company delivers a Company Order to the Trustee that (a) requests the Trustee to

authenticate such Note; and (b) sets forth the name of the Holder of such Note and the date as of which such Note is to be authenticated. If such Company Order also requests the Trustee to deliver such Note to any Holder or to the Depositary (or by the Trustee as its custodian), then the Trustee will promptly deliver such Note in accordance with such Company Order.

(iii) The Trustee may appoint an authenticating agent acceptable to the Company to authenticate Notes. A duly appointed authenticating agent may authenticate Notes whenever the Trustee may do so under this Indenture, and a Note authenticated as provided in this Indenture by such an agent will be deemed, for purposes of this Indenture, to be authenticated by the Trustee. Each duly appointed authenticating agent will have the same rights to deal with the Company as the Trustee would have if it were performing the duties that the authentication agent was validly appointed to undertake.

SECTION 2.03.INITIAL NOTES; NO ADDITIONAL NOTES.

(A)*Initial Notes*. On the Issue Date, there will be originally issued $40,883,000 aggregate principal amount of Notes, subject to the provisions of this Indenture (including **Section 2.02**). Notes issued pursuant to this **Section 2.03(A)**, and any Notes issued in exchange therefor or in substitution thereof, are referred to in this Indenture as the "**Initial Notes**."

(B)*Additional Notes*. The Company may not issue any additional Notes under this Indenture except pursuant to Sections 2.10(B), 2.10(C), 2.11 and 2.13, or Notes issued in respect of interest in accordance with Section 2.05(D).

SECTION 2.04.METHOD OF PAYMENT.

(A)*Global Notes*. The Company will pay, or cause the Paying Agent to pay, the principal (whether due upon maturity on the Maturity Date, Redemption on a Redemption Date or repurchase on a Fundamental Change Repurchase Date or otherwise) of, cash interest or any Applicable Premium or Strategic Make-Whole paid in cash on, and any cash Conversion Consideration for, any Global Note to the Depositary by wire transfer of immediately available funds no later than the time the same is due as provided in this Indenture.

(B)*Physical Notes*. The Company will pay, or cause the Paying Agent to pay, the principal (whether due upon maturity on the Maturity Date, Redemption on a Redemption Date or repurchase on a Fundamental Change Repurchase Date or otherwise) of, cash interest or any Applicable Premium or Strategic Make-Whole paid in cash on, and any cash Conversion Consideration for, any Physical Note no later than the time the same is due as provided in this Indenture by wire transfer of immediately available funds to the account of which the Holder has provided notice to the Company, the Trustee and the Paying Agent pursuant to the immediately following sentence. Payments to Holders shall be made to the account designated by such Holder in the last notice received from such Holder prior to the Close of Business on the following date: (x) with respect to the payment of any interest due on an Interest Payment Date, the immediately preceding Regular Record Date; (y) with respect to any cash Conversion Consideration, two (2) Business Days prior to the relevant Conversion Date; and (z) with respect to any other payment, the date that is fifteen (15) calendar days immediately before the date such payment is due.

SECTION 2.05. BASIS OF INTEREST; DEFAULTED AMOUNTS; WHEN PAYMENT DATE IS NOT A BUSINESS DAY; METHOD OF PAYING INTEREST.

(A) *Basis of Interest*. Each Note will accrue interest at a rate per annum equal to the Cash Interest Rate and/or the Blended Interest Rate, as applicable in accordance with the terms hereof, plus any Additional Interest and Special Interest that may accrue pursuant to Sections 3.04 and 7.03, respectively. Interest on each Note will be, subject to Section 4.02(D), 4.03(E) and 5.02(D) (but without duplication of any payment of interest), payable semi-annually in arrears on each Interest Payment Date, to the Holder of such Note as of the close of business on the immediately preceding Regular Record Date. Interest including, if applicable, Additional Interest and Special Interest, on the Notes will be computed on the basis of a 360-day year comprised of twelve 30-day months.

(B) *Defaulted Amounts*. If the Company fails to pay any amount (a "**Defaulted Amount**") payable on a Note on or before the due date therefor as provided in this Indenture, then, regardless of whether such failure constitutes an Event of Default, (i) such Defaulted Amount will forthwith cease to be payable to the Holder of such Note otherwise entitled to such payment; (ii) to the extent lawful, interest ("**Default Interest**") will accrue on such Defaulted Amount at a rate per annum equal to the Blended Interest Rate, from, and including, such due date to, but excluding, the date of payment of such Defaulted Amount and Default Interest; (iii) such Defaulted Amount and Default Interest will be paid on a payment date selected by the Company to the Holder of such Note as of the Close of Business on a special record date selected by the Company, *provided* that such special record date must be no more than fifteen (15), nor less than ten (10), calendar days before such payment date; and (iv) at least fifteen (15) calendar days before such special record date, the Company will send notice to the Trustee and the Holders that states such special record date, such payment date and the amount of such Defaulted Amount and Default Interest to be paid on such payment date.

(C) *Delay of Payment when Payment Date is Not a Business Day*. If the due date for a payment on a Note as provided in this Indenture is not a Business Day, then, notwithstanding anything to the contrary in this Indenture or the Notes, such payment may be made on the immediately following Business Day and no interest will accrue on such payment as a result of the related delay. Solely for purposes of the immediately preceding sentence, a day on which the applicable place of payment is authorized or required by law or executive order to close or be closed will be deemed not to be a "Business Day."

(D) *Method of Paying Interest*.

(i) The Company may, at its option, elect to pay interest on each Note on any Interest Payment Date (i) by paying an amount in cash on such Interest Payment Date equal to all interest accrued from, and including, the immediately preceding Interest Payment Date (or if there is no immediately preceding Interest Payment Date, from, and including, the issue date of such Note or such other date from which such Note bears interest as stated on such Note) on the principal amount as of the immediately preceding Interest Payment Date (or if there is no immediately preceding Interest Payment Date, on the Initial Principal Amount), calculated at the Cash Interest Rate (the "**Cash Method**") or, (ii) by paying the sum of (x) an amount in cash on such Interest Payment Date equal to a portion not less than 50% of interest accrued (such amount, the "**Cash**

Portion") *plus* (y) a number of shares of Common Stock, to be issued at a price equal to the Minimum Price, equal to the remaining interest not paid in cash under clause (x) (such amount, the "**Stock Amount**"), accrued, in each case of clauses (x) and (y) from, and including, the immediately preceding Interest Payment Date (or if there is no immediately preceding Interest Payment Date, from, and including, the issue date of such Note or such other date from which such Note bears interest as stated on such Note) on the principal amount as of the immediately preceding Interest Payment Date (or if there is no immediately preceding Interest Payment Date, on the Initial Principal Amount), calculated at the Blended Interest Rate (the "**Blended Method**"); *provided* that, notwithstanding any election of the Blended Method, the Company may not pay interest using the Blended Method (and shall instead pay interest for such interest period using the Cash Method) if the simple average of the Daily VWAP for the 10 consecutive Trading Days ending on, and including, the second Trading Day immediately preceding the Interest Payment Date is less than the Minimum Price. In connection with any interest payments using the Blended Method, the Company shall provide notice at least five (5) Business Days prior to the applicable Interest Payment Date to the Trustee, the Paying Agent and the Holders of such payment, specifying the amount of the Cash Portion and of the Stock Amount to be distributed to the Holders and including instructions in accordance Depositary Procedures (if applicable) for the receipt of such Stock Amount. If (A) the Company has elected the Blended Method, then any Holder may, by notice (a "**Blocker Notice**") to the Company (which Blocker Notice may be provided by electronic means in accordance with Depositary Procedures) at least seven (7) Business Days prior to the applicable Interest Payment Date, elect to receive the Stock Amount of such payment (i) using the Cash Method (including the Cash Interest Rate) to the extent such Holder notifies the Company that the receipt by such Holder of the Stock Amount would reasonably be expected to result in such Holder not being in compliance with the Beneficial Ownership Limitation, or (ii) using the Capitalization Method, or (B) the Company and a Holder have mutually agreed, an entire interest payment shall be paid, by payment-in-kind, by increasing the principal amount of such Global Notes by the Capitalization Amount for such Interest Payment Date or, in the case of Physical Notes, by issuing PIK Notes in the amount of the Capitalization Amount thereon in the form of Physical Notes (the "**Capitalization Method**"); *provided* that on any Interest Payment Date on which the Company pays interest using the Blended Method or the Capitalization Method, the Stock Amount or the Capitalization Amount, as applicable, shall be rounded up to the nearest $1.00 or whole share of Common Stock; and *provided further* that for any Notes (1) surrendered for conversion after a Regular Record Date and on or prior to the corresponding Interest Payment Date; (2) redeemed in connection with a Redemption Date that is after a Regular Record Date and on or prior to the corresponding Interest Payment Date; or (3) repurchased on a Fundamental Change Repurchase Date that is after a Regular Record Date and on or prior to the corresponding Interest Payment Date, any Stock Amount or Capitalization Amount which would have been paid in the form of Common Stock or PIK Interest for such Notes on such corresponding Interest Payment Date shall instead be paid in cash at the Cash Interest Rate to the relevant Holder(s) of such Notes as of such Regular Record Date, and no such payment of the Stock Amount or PIK Payment on account of such Notes (notwithstanding any prior election (or deemed election) by the Company to pay such interest pursuant to the Blended Method, election of any Holder to receive the Capitalization Amount for such Notes, or agreement between the Company and any Holder for the Company to pay such interest pursuant to the Capitalization Method) shall be paid. The Company shall irrevocably (subject to this Section 2.05(D)(i), Section 5.02(D), Section 5.02(E) and subject to a Holder's delivery of a Blocker Notice) elect the method of paying interest on an Interest Payment

Date by delivering a notice to the Trustee and Holders on or prior to the 30th calendar day immediately preceding the relevant Interest Payment Date identifying the method selected and (a) the amount of cash interest to be paid and/or (b) the Stock Amount to be paid, as applicable. In the absence of such an election with respect to an Interest Payment Date, the Company shall be deemed to have elected the Cash Method for all of the interest due on such Interest Payment Date. All interest payable in respect of the Interest Payment Date scheduled to occur on the Maturity Date shall be paid entirely by the Cash Method.

(ii) The Company shall make payments of interest by the Cash Method or any Cash Portion in accordance with **Section 3.01** and, in the case of Defaulted Amounts, **Section 2.05(B)**. The Company shall deliver shares of Common Stock in respect of any Stock Amount by the second (2nd) Business Day immediately after the applicable Interest Payment Date (x) if the applicable Notes are represented by one or more Physical Notes, by issuing shares of Common Stock in certificated or book-entry form to the relevant record Holder on the relevant Interest Payment Date in a number equal to the Stock Amount divided by the Minimum Price (rounded up to the nearest whole share) and (y) if the applicable Notes are represented by one or more Global Notes registered in the name of, or held by, the Depositary or its nominee on the relevant Regular Record Date, by issuing shares of Common Stock in global form to the Depositary or its nominee on the relevant Regular Record Date in a number equal to the Stock Amount divided by the Minimum Price (rounded up to the nearest whole share). The Company shall make payments of interest by the Capitalization Method, (x) if the Notes are represented by one or more Physical Notes, by issuing additional Physical Notes to the relevant record Holder on the relevant Interest Payment Date (the "**PIK Notes**") in an aggregate principal amount equal to the relevant amount of interest to be paid by the Capitalization Method (rounded up to the nearest $1.00) and the Trustee will, upon receipt of a Company Order, authenticate and deliver such PIK Notes in the form of Physical Notes for original issuance to the Holders on the relevant Regular Record Date, as shown by the records of the Note Register and (y) if the Notes are represented by one or more Global Notes registered in the name of, or held by, the Depositary or its nominee on the relevant Regular Record Date, by increasing the principal amount of the outstanding Global Note by an amount equal to the amount of PIK Interest for the applicable interest period (rounded up to the nearest $1.00), and the Trustee, upon receipt of a Company Order, will increase the principal amount of the outstanding Global Note by such amount. The issuance of any PIK Notes to any Holder shall be computed on the basis of the aggregate principal amount of the Notes held by such Holder. Any PIK Notes issued as Physical Notes shall be dated as of the applicable Interest Payment Date and shall bear interest from and after such date. All PIK Notes issued pursuant to a PIK Payment shall be governed by, and subject to the terms, provisions and conditions of, this Indenture and shall have the same rights and benefits as the Notes issued on the initial issue date of such Notes. Any PIK Notes shall be issued with the description "PIK Note" on the face of such Note. References in this Indenture and the Notes to the "principal amount" of the Notes shall include any increase in the principal amount of the outstanding Notes as a result of any PIK Payment. The Notes issued on the initial issue date, any increase in the balance of such Notes in connection with the payment of any PIK Interest and any PIK Notes shall be treated as a single class for all purposes under this Indenture.

(iii) Following an increase in the principal amount of the outstanding Global Notes as a result of a PIK Payment, the Global Notes shall bear interest on such increased principal amount from and after the date of such PIK Payment.

In connection with any interest payment described herein, at least two (2) Business Days prior to the applicable Interest Payment Date, the Company shall the provide the Trustee and the Paying Agent with written instruction regarding the payment of interest on such Interest Payment Date (including, without limitation, specifying the amount to be paid to each Holder, the amount of interest to be paid-in-kind by an increase or issuance of Notes and the amount of interest deemed to be paid by the distribution of Common Stock).

In connection with such interest payment methods described herein, neither the Trustee nor any Note Agent has any duty or responsibility to make any determinations, including verifying the completeness, calculations or accuracy of information provided by the Company, or to facilitate the issuance of Common Stock. The Trustee and each Note Agent is fully protected in and can conclusively rely on any instructions or notices of the Company in relation thereto without investigation.

SECTION 2.06. REGISTRAR, PAYING AGENT AND CONVERSION AGENT.

(A) *Generally*. The Company will maintain (i) an office or agency in the continental United States where Notes may be presented for registration of transfer or for exchange (the "**Registrar**"); (ii) an office or agency in the continental United States where Notes may be presented for payment (the "**Paying Agent**"); and (iii) an office or agency in the continental United States where Notes may be presented for conversion (the "**Conversion Agent**"). If the Company fails to maintain a Registrar, Paying Agent or Conversion Agent, then the Trustee will act as such. For the avoidance of doubt, the Company or any of its Subsidiaries may act as Registrar, Paying Agent or Conversion Agent without prior notice to Holders.

(B) *Duties of the Registrar*. The Registrar will keep a record (the "**Register**") of the names and addresses of the Holders, the Notes held by each Holder and the transfer, exchange, repurchase, Redemption and conversion of Notes. Absent manifest error, the entries in the Register will be conclusive and the Company and the Trustee may treat each Person whose name is recorded as a Holder in the Register as a Holder for all purposes. The Register will be in written form or in any form capable of being converted into written form reasonably promptly.

(C) *Co-Agents; Company's Right to Appoint Successor Registrars, Paying Agents and Conversion Agents*. The Company may appoint one or more co-Registrars, co-Paying Agents and co-Conversion Agents, each of whom will be deemed to be a Registrar, Paying Agent or Conversion Agent, as applicable, under this Indenture. Subject to **Section 2.06(A)**, the Company may change any Registrar, Paying Agent or Conversion Agent (including appointing itself or any of its Subsidiaries to act in such capacity) without notice to any Holder. The Company will notify the Trustee (and, upon request, any Holder) of the name and address of each Note Agent, if any, not a party to this Indenture and will enter into an appropriate agency agreement with each such Note Agent, which agreement will implement the provisions of this Indenture that relate to such Note Agent.

(D) *Initial Appointments*. The Company appoints the Trustee as the initial Paying Agent, the initial Registrar and the initial Conversion Agent.

SECTION 2.07.PAYING AGENT AND CONVERSION AGENT TO HOLD PROPERTY IN TRUST.

The Company will require each Paying Agent or Conversion Agent that is not the Trustee to agree in writing that such Note Agent will (A) hold in trust for the benefit of Secured Parties all money and other property held by such Note Agent for payment or delivery due on the Notes; and (B) notify the Trustee of any default by the Company in making any such payment or delivery. The Company, at any time, may, and the Trustee, while any Default continues, may, require a Paying Agent or Conversion Agent to pay or deliver, as applicable, all money and other property held by it to the Trustee, after which payment or delivery, as applicable, such Note Agent (if not the Company or any of its Subsidiaries) will have no further liability for such money or property. If the Company or any of its Subsidiaries acts as Paying Agent or Conversion Agent, then (A) it will segregate and hold in a separate trust fund for the benefit of the Secured Parties all money and other property held by it as Paying Agent or Conversion Agent; and (B) references in this Indenture or the Notes to the Paying Agent or Conversion Agent holding cash or other property, or to the delivery of cash or other property to the Paying Agent or Conversion Agent, in each case for payment or delivery to any Holders or the Trustee or with respect to the Notes, will be deemed to refer to cash or other property so segregated and held separately, or to the segregation and separate holding of such cash or other property, respectively. Upon the occurrence of any event pursuant to **clause (ix)** or **(x)** of **Section 7.01(A)** with respect to the Company (or with respect to any Subsidiary of the Company acting as Paying Agent or Conversion Agent), the Trustee will serve as the Paying Agent or Conversion Agent, as applicable, for the Notes.

SECTION 2.08.HOLDER LISTS.

If the Trustee is not the Registrar, the Company will furnish to the Trustee, no later than seven (7) Business Days before each Interest Payment Date, and at such other times as the Trustee may request, a list, in such form and as of such date or time as the Trustee may reasonably require, of the names and addresses of the Holders.

SECTION 2.09.LEGENDS.

(A)*Global Note Legend*. Each Global Note will bear the Global Note Legend (or any similar legend, not inconsistent with this Indenture, required by the Depositary for such Global Note).

(B)*Non-Affiliate Legend*. Each Note that is not an Affiliate Note will bear the Non-Affiliate Legend.

(C)*Restricted Note Legend*. Subject to **Section 2.12**,

(i) each Note that is a Transfer-Restricted Security will bear the Restricted Note Legend; and

(ii) if a Note is issued in exchange for, in substitution of, or to effect a partial conversion of, another Note (such other Note being referred to as the "old Note" for purposes of this **Section 2.09(C)(ii)**), including pursuant to Section **2.10(B)**, **2.10(C)**, **2.11** or **2.13**, then such Note will bear the Restricted Note Legend if such old Note bore the

Restricted Note Legend at the time of such exchange or substitution, or on the related Conversion Date with respect to such conversion, as applicable; *provided*, *however*, that such Note need not bear the Restricted Note Legend if such Note does not constitute a Transfer-Restricted Security immediately after such exchange or substitution, or as of such Conversion Date, as applicable.

For the avoidance of doubt, the Exchange Notes (other than any Affiliate Notes) shall not bear the Restricted Note Legend and the New Money Notes shall bear the Restricted Note Legend until such New Money Notes cease to be Transfer-Restricted Securities.

(D)*Other Legends*. A Note may bear any other legend or text, not inconsistent with this Indenture, as may be required by applicable law or by any securities exchange or automated quotation system on which such Note is traded or quoted.

(E)*Acknowledgment and Agreement by the Holders*. A Holder's acceptance of any Note bearing any legend required by this **Section 2.09** will constitute such Holder's acknowledgment of, and agreement to comply with, the restrictions set forth in such legend.

(F)*Restricted Stock Legend*.

(i) Each Conversion Share will bear the Restricted Stock Legend if the Note upon the conversion of which such Conversion Share was issued was (or would have been had it not been converted) a Transfer-Restricted Security at the time such Conversion Share was issued; *provided*, *however*, that such Conversion Share need not bear the Restricted Stock Legend if the Company determines, in its reasonable discretion, that such Conversion Share need not bear the Restricted Stock Legend.

(ii) Notwithstanding anything to the contrary in this **Section 2.09(F)**, a Conversion Share need not bear a Restricted Stock Legend if such Conversion Share is issued in an uncertificated form that does not permit affixing legends thereto, *provided* the Company takes measures (including the assignment thereto of a "restricted" CUSIP number) that it reasonably deems appropriate to enforce the transfer restrictions referred to in the Restricted Stock Legend.

SECTION 2.10.TRANSFERS AND EXCHANGES; CERTAIN TRANSFER RESTRICTIONS.

(A)*Provisions Applicable to All Transfers and Exchanges*.

(i) Subject to this **Section 2.10**, Physical Notes and beneficial interests in Global Notes may be transferred or exchanged from time to time and the Registrar will record each such transfer or exchange in the Register.

(ii) Each Note issued upon transfer or exchange of any other Note (such other Note being referred to as the "old Note" for purposes of this **Section 2.10(A)(ii)**) or portion thereof in accordance with this Indenture will be the valid obligation of the Company, evidencing the same indebtedness, and entitled to the same benefits under this Indenture, as such old Note or portion thereof, as applicable.

(iii) The Company, the Guarantors, the Trustee and the Note Agents will not impose any service charge on any Holder for any transfer, exchange or conversion of Notes, but the Company, the Guarantors, the Trustee, the Registrar and the Conversion Agent may require payment of a sum sufficient to cover any transfer tax or similar governmental charge that may be imposed in connection with any transfer, exchange or conversion of Notes, other than exchanges pursuant to **Section 2.11**, **2.17** or **8.05** not involving any transfer.

(iv) Notwithstanding anything to the contrary in this Indenture or the Notes, a Note may not be transferred or exchanged in part unless the portion to be so transferred or exchanged is in an Authorized Denomination.

(v) Neither the Trustee nor any Note Agent will have any obligation or duty to monitor, determine or inquire as to compliance with any transfer restrictions imposed under this Indenture or applicable law with respect to any Security, other than to require the delivery of such certificates or other documentation or evidence as expressly required by this Indenture to be delivered to it and to examine the same to determine substantial compliance as to form with the requirements of this Indenture.

(vi) Each Note issued upon transfer of, or in exchange for, another Note will bear each legend, if any, required by **Section 2.09**.

(vii) Upon satisfaction of the requirements of this Indenture to effect a transfer or exchange of any Note, the Company will cause such transfer or exchange to be effected as soon as reasonably practicable but in no event later than the second (2nd) Business Day after the date of such satisfaction.

(viii) For the avoidance of doubt, and subject to the terms of this Indenture, as used in this **Section 2.10**, an "exchange" of a Global Note or a Physical Note includes (x) an exchange effected for the sole purpose of removing any Restricted Note Legend affixed to such Global Note or Physical Note; and (y) if such Global Note or Physical Note is identified by a "restricted" CUSIP number, an exchange effected for the sole purpose of causing such Global Note or Physical Note to be identified by an "unrestricted" CUSIP number.

(B)*Transfers and Exchanges of Global Notes.*

(i) Subject to the immediately following sentence, no Global Note may be transferred or exchanged in whole except (x) by the Depositary to a nominee of the Depositary; (y) by a nominee of the Depositary to the Depositary or to another nominee of the Depositary; or (z) by the Depositary or any such nominee to a successor Depositary or a nominee of such successor Depositary. No Global Note (or any portion thereof) may be transferred to, or exchanged for, a Physical Note; *provided*, *however*, that a Global Note will be exchanged, pursuant to customary procedures, for one or more Physical Notes if:

(1) (x) the Depositary notifies the Company or the Trustee that the Depositary is unwilling or unable to continue as depositary for such Global Note or (y) the Depositary ceases to be a "clearing agency" registered under Section 17A

of the Exchange Act and, in each case, the Company fails to appoint a successor Depositary within ninety (90) days of such notice or cessation;

(2) an Event of Default has occurred and is continuing and the Company, the Trustee or the Registrar has received a written request from the Depositary, or from a holder of a beneficial interest in such Global Note, to exchange such Global Note or beneficial interest, as applicable, for one or more Physical Notes; or

(3) the Company, in its sole discretion, permits the exchange of any beneficial interest in such Global Note for one or more Physical Notes at the request of the owner of such beneficial interest.

(ii) Upon satisfaction of the requirements of this Indenture to effect a transfer or exchange of any Global Note (or any portion thereof):

(1) the Trustee will reflect any resulting decrease of the principal amount of such Global Note by notation on the "Schedule of Exchanges of Interests in the Global Note" forming part of such Global Note (and, if such notation results in such Global Note having a principal amount of zero, the Company may (but is not required to) instruct the Trustee to cancel such Global Note pursuant to **Section 2.15**);

(2) if required to effect such transfer or exchange, then the Trustee will reflect any resulting increase of the principal amount of any other Global Note by notation on the "Schedule of Exchanges of Interests in the Global Note" forming part of such other Global Note;

(3) if required to effect such transfer or exchange, then the Company will issue, execute and deliver, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, a new Global Note bearing each legend, if any, required by **Section 2.09**; and

(4) if such Global Note (or such portion thereof), or any beneficial interest therein, is to be exchanged for one or more Physical Notes, then the Company will issue, execute and deliver, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, one or more Physical Notes that (x) are in Authorized Denominations and have an aggregate principal amount equal to the principal amount of such Global Note to be so exchanged; (y) are registered in such name(s) as the Depositary specifies (or as otherwise determined pursuant to customary procedures); and (z) bear each legend, if any, required by **Section 2.09**.

(iii) Each transfer or exchange of a beneficial interest in any Global Note will be made in accordance with the Depositary Procedures.

(C)*Transfers and Exchanges of Physical Notes.*

(i) Subject to this **Section 2.10**, a Holder of a Physical Note may (x) transfer such Physical Note (or any portion thereof in an Authorized Denomination) to one or more other Person(s); (y) exchange such Physical Note (or any portion thereof in an Authorized Denomination) for one or more other Physical Notes in Authorized Denominations having an aggregate principal amount equal to the aggregate principal amount of the Physical Note (or portion thereof) to be so exchanged; and (z) if then permitted by the Depositary Procedures, and provided such Physical Note is not an Affiliate Note, transfer such Physical Note (or any portion thereof in an Authorized Denomination) in exchange for a beneficial interest in one or more Global Notes; *provided*, *however*, that, to effect any such transfer or exchange, such Holder must:

(1) surrender such Physical Note to be transferred or exchanged to the office of the Registrar, together with any endorsements or transfer instruments reasonably required by the Company, the Trustee or the Registrar; and

(2) deliver such certificates, documentation or evidence as may be required pursuant to **Section 2.10(D)**.

(ii) Upon the satisfaction of the requirements of this Indenture to effect a transfer or exchange of any Physical Note (such Physical Note being referred to as the "old Physical Note" for purposes of this **Section 2.10(C)(ii)**) of a Holder (or any portion of such old Physical Note in an Authorized Denomination):

(1) such old Physical Note will be promptly cancelled pursuant to **Section 2.15**;

(2) if such old Physical Note is to be so transferred or exchanged only in part, then the Company will issue, execute and deliver, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, one or more Physical Notes that (x) are in Authorized Denominations and have an aggregate principal amount equal to the principal amount of such old Physical Note not to be so transferred or exchanged; (y) are registered in the name of such Holder; and (z) bear each legend, if any, required by **Section 2.09**;

(3) in the case of a transfer:

(a) to the Depositary or a nominee thereof that will hold its interest in such old Physical Note (or such portion thereof) to be so transferred in the form of one or more Global Notes, the Trustee will reflect an increase of the principal amount of one or more existing Global Notes by notation on the "Schedule of Exchanges of Interests in the Global Note" forming part of such Global Note(s), which increase(s) are in Authorized Denominations and aggregate to the principal amount to be so transferred, and which Global Note(s) bear each legend, if any, required by **Section 2.09**; *provided*, *however*, that if such transfer cannot be so effected by notation on one or more existing Global Notes (whether because no Global Notes bearing each legend, if any, required by **Section 2.09** then exist,

because any such increase will result in any Global Note having an aggregate principal amount exceeding the maximum aggregate principal amount permitted by the Depositary or otherwise), then the Company will issue, execute and deliver, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, one or more Global Notes that (x) are in Authorized Denominations and have an aggregate principal amount equal to the principal amount to be so transferred; and (y) bear each legend, if any, required by **Section 2.09**; and

(b) to a transferee that will hold its interest in such old Physical Note (or such portion thereof) to be so transferred in the form of one or more Physical Notes, the Company will issue, execute and deliver, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, one or more Physical Notes that (x) are in Authorized Denominations and have an aggregate principal amount equal to the principal amount to be so transferred; (y) are registered in the name of such transferee; and (z) bear each legend, if any, required by **Section 2.09**; and

(4) in the case of an exchange, the Company will issue, execute and deliver, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, one or more Physical Notes that (x) are in Authorized Denominations and have an aggregate principal amount equal to the principal amount to be so exchanged; (y) are registered in the name of the Person to whom such old Physical Note was registered; and (z) bear each legend, if any, required by **Section 2.09**.

(D)*Requirement to Deliver Documentation and Other Evidence*. If a Holder of any Note that is identified by a "restricted" CUSIP number or that bears a Restricted Note Legend or is a Transfer-Restricted Security requests to:

(i) cause such Note to be identified by an "unrestricted" CUSIP number;

(ii) remove such Restricted Note Legend; or

(iii) register the transfer of such Note to the name of another Person,

then the Company, the Guarantors, the Trustee and the Registrar may refuse to effect such identification, removal or transfer, as applicable, unless there is delivered to the Company, the Guarantors, the Trustee and the Registrar such certificates or other documentation or evidence as the Company and the Guarantors may reasonably require to determine that such identification, removal or transfer, as applicable, complies with the Securities Act and other applicable securities laws; *provided*, *however*, that no such certificates, documentation or evidence need be so delivered on and after the Free Trade Date with respect to such Note unless the Company determines, in its reasonable discretion, that such Note is not eligible to be offered, sold or otherwise transferred pursuant to Rule 144 or otherwise without any requirements as to volume, manner of sale, availability of current public information or notice under the Securities Act.

(E)*Transfers of Notes Subject to Redemption, Repurchase or Conversion*. Notwithstanding anything to the contrary in this Indenture or the Notes, the Company, the Guarantors, the Trustee and the Registrar will not be required to register the transfer of or exchange any Note that (i) has been surrendered for conversion, except to the extent that any portion of such Note is not subject to conversion; or (ii) is subject to a Fundamental Change Repurchase Notice validly delivered, and not withdrawn, pursuant to **Section 4.02(F)**, except to the extent that any portion of such Note is not subject to such notice or the Company fails to pay the applicable Fundamental Change Repurchase Price when due; or (iii) has been selected for Redemption pursuant to a Redemption Notice, except to the extent that the Company fails to pay the applicable Redemption Price when due.

SECTION 2.11.EXCHANGE AND CANCELLATION OF NOTES TO BE CONVERTED OR TO BE REPURCHASED PURSUANT TO A REPURCHASE UPON FUNDAMENTAL CHANGE OR REDEMPTION.

(A)*Partial Conversions of Physical Notes and Partial Repurchases of Physical Notes Pursuant to a Repurchase Upon Fundamental Change*. If only a portion of a Physical Note of a Holder is to be converted pursuant to **Article 5** or repurchased pursuant to a Repurchase Upon Fundamental Change, then, as soon as reasonably practicable after such Physical Note is surrendered for such conversion or repurchase, as applicable, the Company will cause such Physical Note to be exchanged, pursuant and subject to **Section 2.10(C)**, for (i) one or more Physical Notes that are in Authorized Denominations and have an aggregate principal amount equal to the principal amount of such Physical Note that is not to be so converted or repurchased, as applicable, and deliver such Physical Note(s) to such Holder; and (ii) a Physical Note having a principal amount equal to the principal amount to be so converted or repurchased, as applicable, which Physical Note will be converted or repurchased, as applicable, pursuant to the terms of this Indenture; *provided*, *however*, that the Physical Note referred to in this **clause (ii)** need not be issued at any time after which such principal amount subject to such conversion or repurchase, as applicable, is deemed to cease to be outstanding pursuant to **Section 2.18**.

(B)*Cancellation of Notes that Are Converted and Notes that Are Repurchased Pursuant to a Repurchase Upon Fundamental Change or Redemption*.

(i) *Physical Notes*. If a Physical Note (or any portion thereof that has not theretofore been exchanged pursuant to **Section 2.11(A)**) of a Holder is to be converted pursuant to **Article 5** or repurchased pursuant to a Repurchase Upon Fundamental Change or Redemption, then, promptly after the later of the time such Physical Note (or such portion) is deemed to cease to be outstanding pursuant to **Section 2.18** and the time such Physical Note is surrendered for such conversion or repurchase, as applicable, (1) such Physical Note will be cancelled pursuant to **Section 2.15**; and (2) in the case of a partial conversion or repurchase, as applicable, the Company will issue, execute and deliver to such Holder, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, one or more Physical Notes that (x) are in Authorized Denominations and have an aggregate principal amount equal to the principal amount of such Physical Note that is not to be so converted or repurchased, as applicable; (y) are registered in the name of such Holder; and (z) bear each legend, if any, required by **Section 2.09**.

(ii) *Global Notes*. If a Global Note (or any portion thereof) is to be converted pursuant to **Article 5** or repurchased pursuant to a Repurchase Upon Fundamental Change or Redemption, then, promptly after the time such Note (or such portion) is deemed to cease to be outstanding pursuant to **Section 2.18**, the Trustee will reflect a decrease of the principal amount of such Global Note in an amount equal to the principal amount of such Global Note to be so converted or repurchased, as applicable, by notation on the "Schedule of Exchanges of Interests in the Global Note" forming part of such Global Note (and, if the principal amount of such Global Note is zero following such notation -and the Company makes written request to the Trustee to cancel such Global Note, cancel such Global Note pursuant to **Section 2.15**).

SECTION 2.12.REMOVAL OF TRANSFER RESTRICTIONS.

Without limiting the generality of any other provision of this Indenture (including **Section 3.04**), the Restricted Note Legend affixed to any Note (including any New Money Note) will be deemed, pursuant to this **Section 2.12** and the footnote to such Restricted Note Legend, to be removed therefrom upon the Company's delivery to the Trustee of notice, signed on behalf of the Company by one (1) of its Officers, to such effect (and, for the avoidance of doubt, such notice need not be accompanied by an Officer's Certificate or an Opinion of Counsel in order to be effective to cause such Restricted Note Legend to be deemed to be removed from such Note). If such Note bears a "restricted" CUSIP or ISIN number at the time of such delivery, then, upon such delivery, such Note will be deemed, pursuant to this **Section 2.12** and the footnotes to the CUSIP and ISIN numbers set forth on the face of the certificate representing such Note, to thereafter bear the "unrestricted" CUSIP and ISIN numbers identified in such footnotes; *provided*, *however*, that if such Note is a Global Note and the Depositary thereof requires a mandatory exchange or other procedure to cause such Global Note to be identified by "unrestricted" CUSIP and ISIN numbers in the facilities of such Depositary, then (i) the Company will effect such exchange or procedure as soon as reasonably practicable; and (ii) for purposes of **Section 3.04** and the definition of Freely Tradable, such Global Note will not be deemed to be identified by "unrestricted" CUSIP and ISIN numbers until such time as such exchange or procedure is effected.

SECTION 2.13.REPLACEMENT NOTES.

If a Holder of any Note claims that such Note has been mutilated, lost, destroyed or wrongfully taken, then the Company will issue, execute and deliver, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, a replacement Note upon surrender to the Trustee of such mutilated Note, or upon delivery to the Trustee of evidence of such loss, destruction or wrongful taking reasonably satisfactory to the Trustee and the Company. In the case of a mutilated, lost, destroyed or wrongfully taken Note, the Company and the Trustee may require the Holder thereof to provide such security or indemnity that is reasonably satisfactory to the Company and the Trustee to protect the Company and the Trustee from any loss that any of them may suffer if such Note is replaced.

Every replacement Note issued pursuant to this **Section 2.13** will be an additional obligation of the Company and will be entitled to all of the benefits of this Indenture equally and ratably with all other Notes issued under this Indenture.

Section 2.14.Registered Holders; Certain Rights with Respect to Global Notes.

Only the Holder of a Note will have rights under this Indenture as the owner of such Note. Without limiting the generality of the foregoing, Depositary Participants will have no rights as such under this Indenture with respect to any Global Note held on their behalf by the Depositary or its nominee, or by the Trustee as its custodian, and the Company, the Guarantors, the Trustee and the Note Agents, and their respective agents, may treat the Depositary as the absolute owner of such Global Note for all purposes whatsoever; *provided*, *however*, that (A) the Holder of any Global Note may grant proxies and otherwise authorize any Person, including Depositary Participants and Persons that hold interests in Notes through Depositary Participants, to take any action that such Holder is entitled to take with respect to such Global Note under this Indenture or the Notes; and (B) the Company, the Guarantors, the Trustee and the Collateral Agent, and their respective agents, may give effect to any written certification, proxy or other authorization furnished by the Depositary. Neither the Trustee nor any other Note Agent will have any responsibility or liability for any aspects of the records maintained by, or any other actions or omissions of, the Depositary or any of the Depositary Participants.

Section 2.15.Cancellation.

Without limiting the generality of **Section 3.08**, the Company may at any time deliver Notes to the Trustee for cancellation. The Registrar, the Paying Agent and the Conversion Agent will forward to the Trustee each Note duly surrendered to them for transfer, exchange, payment or conversion. The Trustee will promptly cancel all Notes so surrendered to it in accordance with its customary procedures. The Company may not originally issue new Notes to replace Notes that it has paid or that have been cancelled upon transfer, exchange, payment or conversion. For the avoidance of doubt, the cancelation of Notes shall be effectuated in accordance with the Trustee's customary procedures.

Section 2.16.Notes Held by the Company or its Subsidiaries.

Without limiting the generality of **Sections 3.08** and **2.18**, in determining whether the Holders of the required aggregate principal amount of Notes have concurred in any direction, waiver, consent or other action under this Indenture, Notes owned by the Company or any of its Subsidiaries will be deemed not to be outstanding; *provided*, *however*, that, for purposes of determining whether the Trustee is protected in relying on any such direction, waiver, consent or other action, only Notes that a Responsible Officer of the Trustee actually knows are so owned will be so disregarded.

Section 2.17.Temporary Notes.

Until definitive Notes are ready for delivery, the Company may issue, execute and deliver, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, temporary Notes. Temporary Notes will be substantially in the form of definitive Notes but may have variations that the Company considers appropriate for temporary Notes. The Company will promptly prepare, issue, execute and deliver, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, definitive Notes in exchange for temporary Notes. Until so exchanged, each

temporary Note will in all respects be entitled to the same benefits under this Indenture as definitive Notes.

SECTION 2.18. OUTSTANDING NOTES.

(A) *Generally*. The Notes that are outstanding at any time will be deemed to be those Notes that, at such time, have been duly executed and authenticated, excluding those Notes (or portions thereof) that have theretofore been (i) cancelled by the Trustee or delivered to the Trustee for cancellation in accordance with **Section 2.15**; (ii) assigned a principal amount of zero by notation on the "Schedule of Exchanges of Interests in the Global Note" forming part of any a Global Note representing such Note; (iii) paid in full (including upon conversion) in accordance with this Indenture; or (iv) deemed to cease to be outstanding to the extent provided in, and subject to, **clause (B)**, **(C)** or **(D)** of this **Section 2.18**. Notwithstanding anything herein to the contrary, with respect to any requirement for the Trustee or any Note Agent to record any transfer, exchange or conversion through a notation on the "Schedule of Exchanges of Interests in the Global Note", such notation shall be deemed made for all purposes without any further action upon the Trustee or the Registrar updating the Register to reflect any applicable increase or decrease in the applicable Global Note.

(B) *Replaced Notes*. If a Note is replaced pursuant to **Section 2.13**, then such Note will cease to be outstanding at the time of its replacement, unless the Trustee and the Company receive proof reasonably satisfactory to them that such Note is held by a "*bona fide* purchaser" under applicable law.

(C) *Maturing Notes and Notes Called for Redemption or Subject to Repurchase*. If, on a Redemption Date, a Fundamental Change Repurchase Date or the Maturity Date, the Paying Agent holds money sufficient to pay the aggregate Redemption Price, Fundamental Change Repurchase Price or principal amount, respectively, together, in each case, with the aggregate interest, in each case due on such date, then (unless there occurs a Default in the payment of any such amount) (i) the Notes (or portions thereof) to be redeemed or repurchased, or that mature, on such date will be deemed, as of such date, to cease to be outstanding, except to the extent provided in **Section 4.02(D)**, **4.03(E)** or **5.02(D)**; and (ii) the rights of the Holders of such Notes (or such portions thereof), as such, will terminate with respect to such Notes (or such portions thereof), other than the right to receive the Redemption Price, Fundamental Change Repurchase Price or principal amount, as applicable, of, and accrued and unpaid interest on, such Notes (or such portions thereof), in each case as provided in this Indenture.

(D) *Notes to Be Converted*. At the Close of Business on the Conversion Date for any Note (or any portion thereof) to be converted, such Note (or such portion) will (unless there occurs a Default in the delivery of the Conversion Consideration or interest due, pursuant to **Section 5.03(A)** or **Section 5.02(D)**, upon such conversion) be deemed to cease to be outstanding, except to the extent provided in **Section 5.02(D)** or **Section 5.08**.

(E) *Cessation of Accrual of Interest*. Except as provided in **Section 4.02(D)**, **4.03(E)** or **5.02(D)**, interest will cease to accrue on each Note from, and including, the date that such Note is deemed, pursuant to this **Section 2.18**, to cease to be outstanding, unless there occurs a default in the payment or delivery of any cash or other property due on such Note.

Section 2.19.Repurchases by the Company.

Without limiting the generality of **Sections 2.15** and **3.08**, the Company may, from time to time, repurchase Notes in open market purchases or in negotiated transactions or otherwise, whether through private or public tender or exchange offers, cash-settled swaps, other cash-settled derivatives or private open market repurchases not involving a tender offer with one or more Holders without delivering prior notice to Holders.

Section 2.20.CUSIP and ISIN Numbers.

Subject to **Section 2.12**, the Company may use one or more CUSIP or ISIN numbers to identify any of the Notes, and, if so, the Company and the Trustee will use such CUSIP or ISIN number(s) in notices to Holders; *provided*, *however*, that (i) the Trustee makes no representation as to the correctness or accuracy of any such CUSIP or ISIN number; and (ii) the effectiveness of any such notice will not be affected by any defect in, or omission of, any such CUSIP or ISIN number. The Company will promptly notify the Trustee of any change in the CUSIP or ISIN number(s) identifying any Notes.

Section 2.21.Beneficial Ownership Limitation.

Subject to the final sentence of this **Section 2.21**, the Company shall not effect any conversion of the Notes or issue any shares of Common Stock in respect of the Blended Method, and a Holder shall not have the right to convert any portion of the Notes pursuant to **Article V**, to the extent that after giving effect to such issuance after conversion as set forth on the applicable Notice of Conversion or such payment, the Holder (together with the Holder's Affiliates, and any other Persons acting as a group together with the Holder or any of the Holder's Affiliates (such Persons, "**Attribution Parties**")), would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon such payment and conversion of the Notes with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (i) conversion of the remaining, unconverted portion of these Notes beneficially owned by the Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other securities of the Company or its Subsidiaries which would entitle the holder thereof to acquire at any time shares of Common Stock, including, without limitation, any debt, preferred stock, right, option, warrant or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock) subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this **Section 2.21**, beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder, it being acknowledged by the Holder that the Company is not representing to the Holder that such calculation is in compliance with Section 13(d) of the Exchange Act and the Holder is solely responsible for any schedules required to be filed in accordance therewith. To avoid doubt, the calculation of the Beneficial Ownership Limitation shall take into account the concurrent exercise

or conversion, as applicable, of the unexercised or unconverted portion of any other securities of the Company (including, without limitation, any other Common Stock Equivalents) beneficially owned by the Holder or any Attribution Party, as applicable. To the extent that the limitation contained in this **Section 2.21** applies, the determination of whether the Notes are convertible (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of the Notes are convertible shall be in the sole discretion of the Holder, and the submission of a Notice of Conversion shall be deemed to be the Holder's determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of the Notes are convertible, in each case subject to the Beneficial Ownership Limitation, and the Company shall have no obligation to verify or confirm the accuracy of such determination (including any determination as to group status pursuant to the next sentence). In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this **Section 2.21**, in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as reflected in (A) the Company's most recent periodic or annual report filed with the Commission, as the case may be, (B) a more recent public announcement by the Company or (C) a more recent written notice by the Company or its transfer agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Company shall within one (1) Trading Day confirm orally and in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to any payment in the form of Common Stock by the Blended Method and the conversion or exercise of securities of the Company, including the Notes, by the Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "**Beneficial Ownership Limitation**" shall be, (i) with respect to all Holders other than the Permitted Parties, 9.9% of the number of shares of the Common Stock outstanding immediately after giving effect to such payment and the issuance of shares of Common Stock issuable upon conversion of the Notes and (ii) with respect to the Permitted Parties, 49.9% of the number of shares of the Common Stock outstanding immediately after giving effect to such payment and the issuance of shares of Common Stock issuable upon conversion of the Notes. A Holder, upon notice to the Company, may increase or decrease the Beneficial Ownership Limitation provisions of this **Section 2.21**, provided that the Beneficial Ownership Limitation in no event (i) in the case of Holders other than the Permitted Parties, is lower than 9.9% or exceeds 19.9% of the number of shares of the Common Stock outstanding immediately after giving effect to such payment and the issuance of shares of Common Stock upon conversion of the Notes held by the Holder and the provisions of this **Section 2.21** shall continue to apply and (ii) in the case of the Permitted Parties, is lower than 9.9% or exceeds 49.9% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon such payment and conversion of the Notes held by the Holder and the provisions of this **Section 2.21** shall continue to apply. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this **Section 2.21** to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation herein contained or to make changes or supplements necessary or desirable to properly give effect to such limitation. The

limitations contained in this paragraph shall apply to a successor holder of the Notes. Solely for the purpose of this **Section 2.21**, in the case of Global Notes, "Holder" shall mean a person that holds a beneficial interest in the Notes and not the Depository Trust Company or its nominee. Notwithstanding anything in this **Section 2.21** to the contrary, to the extent that the receipt of shares of Common Stock for any reason pursuant to the terms of this Indenture (whether upon conversion or otherwise) is or would be limited due to the application of the Beneficial Ownership Limitation, the Company shall, at the Holder's request, (x) allow such conversion, to the extent otherwise conversion would otherwise be limited, (y) issue any such shares of Common Stock the receipt of which is otherwise limited due to the application of the Beneficial Ownership Limitation as pre-funded warrants in the form attached as Exhibit D to this Indenture and (z) to the extent that a Holder is an Affiliate of the Company, the Company and the Board of Directors shall take all actions necessary to ensure that any issuance of pre-funded warrants pursuant to this **Section 2.21** is exempt from the application of Section 16 of the Exchange Act pursuant to Rule 16b-3 thereunder (to the extent such rule is applicable).

Article 3.COVENANTS

SECTION 3.01.PAYMENT ON NOTES.

(A)*Generally*. The Company will pay or cause to be paid all the principal of, the Fundamental Change Repurchase Price and Redemption Price for, interest on, and other amounts due with respect to, the Notes on the dates and in the manner set forth in this Indenture.

(B)*Deposit of Funds*. Before 10:00 A.M., New York City time, on each Redemption Date, Fundamental Change Repurchase Date or Interest Payment Date on which any cash amount is due on the Notes, and on the Maturity Date or any other date on which any cash amount is due on the Notes, the Company will deposit, or will cause there to be deposited, with the Paying Agent cash, in funds immediately available on such date, sufficient to pay the cash amount due on the applicable Notes on such date. The Paying Agent will return to the Company, as soon as practicable, any money not required for such purpose.

SECTION 3.02.EXCHANGE ACT REPORTS.

(A)*Generally*. The Company will send to the Trustee copies of all reports that the Company is required to file with or furnish to the SEC pursuant to Section 13(a) or 15(d) of the Exchange Act within fifteen (15) calendar days after the date that the Company is required to file or furnish the same (after giving effect to all applicable grace periods under the Exchange Act); *provided*, *however*, that the Company need not send to the Trustee any material for which the Company has received, or is seeking in good faith and has not been denied, confidential treatment by the SEC. Any report that the Company files with or furnishes to the SEC through the EDGAR system (or any successor thereto) will be deemed to be sent to the Trustee at the time such report is so filed or furnished via the EDGAR system (or such successor). Upon the request of any Holder, the Trustee will provide to such Holder a copy of any report that the Company has sent the Trustee pursuant to this **Section 3.02(A)**, other than a report that is deemed to be sent to the Trustee pursuant to the preceding sentence.

(B)*Trustee's Disclaimer*. The Trustee need not determine whether the Company has filed or furnished any material via the EDGAR system (or such successor). The sending, filing or furnishing of reports pursuant to **Section 3.02(A)** will not be deemed to constitute actual or constructive notice or knowledge to the Trustee of any information contained, or determinable from information contained, therein, including the Company's compliance with any of its covenants under this Indenture (as to which the Trustee is entitled to rely exclusively on an Officer's Certificate). The Trustee is under no duty to examine any such reports, information or documents delivered to the Trustee or filed with the SEC via EDGAR to ensure compliance with the provisions of this Indenture or to ascertain the correctness or otherwise of the information or the statements contained therein.

SECTION 3.03.RULE 144A INFORMATION.

If the Company is not subject to Section 13 or 15(d) of the Exchange Act at any time when any Notes or shares of Common Stock issuable upon conversion of the Notes are outstanding and constitute "restricted securities" (as defined in Rule 144), then the Company (or its successor) will promptly provide, to the Trustee and, upon written request, to any Holder, beneficial owner or prospective purchaser of such Notes or shares, the information required to be delivered pursuant to Rule 144A(d)(4) under the Securities Act to facilitate the resale of such Notes or shares pursuant to Rule 144A. The Company (or its successor) will take such further action as any Holder or beneficial owner of such Notes or shares may reasonably request to enable such Holder or beneficial owner to sell such Notes or shares pursuant to Rule 144A.

SECTION 3.04.ADDITIONAL INTEREST.

(A)*Accrual of Additional Interest*.

(i) If, at any time during the six (6) month period beginning on, and including, the date that is six (6) months after the Original Issue Date of any New Money Note (other than any Affiliate Notes),

(1) the Company fails to timely file any report (other than Form 8-K reports) that the Company is required to file with the SEC pursuant to Section 13 or 15(d) of the Exchange Act (after giving effect to all applicable grace periods thereunder); or

(2) such New Money Note is not otherwise Freely Tradable,

then Additional Interest will accrue on such Note for each day during such period on which such failure is continuing or such Note is not Freely Tradable.

(ii) In addition, Additional Interest will accrue on a New Money Note (other than any Affiliates Notes) on each day on which such Note is not Freely Tradable on or after the De-Legending Deadline Date for such New Money Note.

(B)*Amount and Payment of Additional Interest*. Any Additional Interest that accrues on a Note pursuant to **Section 3.04(A)** will be payable on the same dates and in the same manner as the interest on such Note and will accrue at a rate per annum equal to one quarter of one percent

(0.25%) of the principal amount thereof for the first ninety (90) days on which Additional Interest accrues and, thereafter, at a rate per annum equal to one half of one percent (0.50%) of the principal amount thereof; *provided*, *however*, that in no event will Additional Interest, together with any Special Interest, accrue on any day on a Note at a combined rate per annum that exceeds one half of one percent (0.50%). For the avoidance of doubt, any Additional Interest that accrues on a Note will be in addition to the interest that accrues on such Note and, subject to the proviso of the immediately preceding sentence, in addition to any Special Interest that accrues on such Note.

(C)*Notice of Accrual of Additional Interest; Trustee's Disclaimer*. The Company will send notice to the Holder of each Note, and to the Trustee, of the commencement and termination of any period in which Additional Interest accrues on such Note. In addition, if Additional Interest accrues on any Note, then, no later than five (5) Business Days before each date on which such Additional Interest is to be paid, the Company will deliver an Officer's Certificate to the Trustee and the Paying Agent stating (i) that the Company is obligated to pay Additional Interest on such Note on such date of payment; and (ii) the amount of such Additional Interest that is payable on such date of payment. The Trustee will have no duty to determine whether any Additional Interest is payable or the amount thereof.

Section 3.05.Compliance and Default Certificates.

(A)*Annual Compliance Certificate*. Within ninety (90) days after December 31, 2023 and each fiscal year of the Company ending thereafter, the Company will deliver an Officer's Certificate to the Trustee stating (i) that the signatory thereto has supervised a review of the activities of the Company and its Subsidiaries during such fiscal year with a view towards determining whether any Default or Event of Default has occurred; and (ii) whether, to such signatory's knowledge, a Default or Event of Default has occurred or is continuing (and, if so, describing all such Defaults or Events of Default and what action the Company is taking or proposes to take with respect thereto).

(B)*Default Certificate*. If a Default or Event of Default occurs, then the Company will promptly deliver an Officer's Certificate to the Trustee describing the same and what action the Company is taking or proposes to take with respect thereto.

Section 3.06.Stay, Extension and Usury Laws.

To the extent that it may lawfully do so, the Company (A) agrees that it will not at any time insist upon, plead, or in any manner whatsoever claim or take the benefit or advantage of, any stay, extension or usury law (wherever or whenever enacted or in force) that may affect the covenants or the performance of this Indenture; and (B) expressly waives all benefits or advantages of any such law and agrees that it will not, by resort to any such law, hinder, delay or impede the execution of any power granted to the Trustee by this Indenture, but will suffer and permit the execution of every such power as though no such law has been enacted.

Section 3.07.Corporate Existence.

Subject to **Article 6**, the Company will do or cause to be done all things necessary to preserve and keep in full force and effect its corporate existence.

SECTION 3.08.ACQUISITION OF NOTES BY THE COMPANY AND ITS SUBSIDIARIES.

The Company will promptly deliver to the Trustee for cancellation all Notes that the Company or any of its Subsidiaries have purchased or otherwise acquired.

SECTION 3.09.LIMITATION ON INCURRENCE OF INDEBTEDNESS.

(A)The Company will not, and will not permit any of its Subsidiaries to, directly or indirectly, create, incur, issue, assume, enter into a guarantee of or otherwise become directly or indirectly liable, contingently or otherwise, with respect to (collectively, "**incur**") any Indebtedness, and the Company will not issue any Disqualified Stock and will not permit any of its Subsidiaries to issue any shares of Preferred Stock.

(B)Notwithstanding anything to the contrary therein, **Section 3.09(A)** will not prohibit the incurrence of any of the following items of Indebtedness or the issuance of any of the following Disqualified Stock or Preferred Stock (collectively, "**Permitted Debt**"):

(i) the incurrence by the Company and its Subsidiaries of the existing Indebtedness outstanding as of the Issue Date;

(ii) the incurrence by the Company and the Guarantors of the Notes and the related Guarantees (and any exchanges of Notes and Guarantees thereof);

(iii) the incurrence by the Company or any Guarantor of purchase money Indebtedness to finance the acquisition of personal property consisting solely of fixed or capital assets, including Capital Lease Obligations, and any Indebtedness assumed in connection with the acquisition of any such assets or secured by a Lien on any such assets prior to the acquisition thereof, and Permitted Refinancing Indebtedness to refinance such Indebtedness; *provided*, *however*, that (A) the aggregate principal amount of Indebtedness permitted by this clause (iii) shall not exceed, at any one time outstanding, (x) if incurred to finance (or refinance) the acquisition of assets to be utilized in connection with the conduct of pre-clinical and clinical programs and studies, $2,000,000 and (y) for all other purposes, $250,000 and (B) if secured, such Liens shall attach only to the assets acquired with such Indebtedness and shall not extend to any other property or assets of the Company and any of its Subsidiaries;

(iv) the incurrence by the Company or any of its Subsidiaries of Permitted Refinancing Indebtedness to refinance any Indebtedness that was permitted to be incurred under **Section 3.09(B)** (other than clauses (ii), (iii), (v) and (xxi) thereof);

(v) the incurrence by the Company or any of its Subsidiaries of intercompany Indebtedness (or the guarantees of any such intercompany Indebtedness) between or among the Company or any of its Subsidiaries to the extent specifically excluded from the definition of Investment or otherwise constituting a Permitted Investment, *provided*, *however*, that (A) any subsequent issuance or transfer of Capital Stock that results in any such Indebtedness being held by a Person other than the Company or a Subsidiary and (B) any sale or other transfer of any such Indebtedness to a Person that is not the Company or

a Subsidiary, will be deemed, in each case, to constitute an incurrence of such Indebtedness by the Company or such Subsidiary, as the case may be, that was not permitted by this clause (v);

(vi) the issuance by any of the Company's Subsidiaries to the Company or any of its Subsidiaries of shares of Preferred Stock; *provided*, *however*, that (A) any subsequent issuance or transfer of Capital Stock that results in any such Preferred Stock being held by a Person other than the Company or a Subsidiary and (B) any sale or other transfer of any such Preferred Stock to a Person that is not the Company or a Subsidiary, will be deemed, in each case, to constitute an issuance of such Preferred Stock by such Subsidiary that was not permitted by this clause (vi);

(vii) contingent liabilities under performance, indemnity, bid, stay, customs, appeal, replevin and surety bonds, performance and completion guarantees or similar instruments incurred in the ordinary course of business;

(viii) the guarantee by the Company or any of its Subsidiaries of Indebtedness of the Company or any of its Subsidiaries permitted to be incurred under any other provision of **Section 3.09(B)**, *provided* that (A) any guarantee by the Company or any Guarantor of the Indebtedness of any Subsidiary of the Company that is not a Guarantor shall be deemed to be an Investment, which such Investment must constitute a Permitted Investment hereunder and (B) if the Indebtedness being guaranteed is subordinated in right of payment or lien priority to or *pari passu* with the Notes, then the guarantee must be subordinated or *pari passu*, as applicable, in right of payment or lien priority to the same extent as the Indebtedness guaranteed;

(ix) [reserved];

(x) the incurrence of contingent liabilities arising out of endorsements of checks, drafts and other similar instruments for deposit or collection in the ordinary course of business;

(xi) the incurrence of Indebtedness in the ordinary course of business under any agreement between the Company or any of its Subsidiaries and any commercial bank or other financial institution relating to Treasury Management Arrangements;

(xii) Indebtedness (other than for borrowed money) owed to any Person providing property, casualty, liability or other insurance to the Company or any of its Subsidiaries, so long as the amount of such Indebtedness is not in excess of the amount of the unpaid cost of, and shall be incurred only to defer the cost of, the premiums with respect to such insurance for the period in which such Indebtedness is incurred and such Indebtedness is outstanding only for a period not exceeding twelve months;

(xiii) Obligations in respect of governmental grants, financial aid, tax incentives, subsidies, tax holidays and other similar governmental benefits or incentives, and guarantees or restrictions related thereto;

(xiv) Indebtedness incurred by the Company or any of its Subsidiaries constituting reimbursement obligations with respect to letters of credit and bank guarantees issued in the ordinary course of business, including, without limitation, letters of credit in respect of workers' compensation claims, health, disability or other employee benefits (whether current or former) or property, casualty or liability insurance or self-insurance, or to landlords, utilities and/or vendors in the ordinary course of business, or other Indebtedness with respect to reimbursement-type obligations regarding workers' compensation claims; provided that any reimbursement obligations in respect thereof are reimbursed within 90 days following the due date thereof;

(xv) Indebtedness representing deferred compensation or similar obligation to employees of the Company or any of its Subsidiaries or incurred in the ordinary course of business;

(xvi) customer deposits and advance payments received in the ordinary course of business from customers for goods and services in the ordinary course of business;

(xvii) Indebtedness of the Company and its Subsidiaries, to the extent the Net Proceeds thereof are promptly used (A) to purchase all of the outstanding Notes tendered for repurchase in connection with a Fundamental Change or (B) to redeem all of the outstanding Notes pursuant to **Section 4.03**;

(xviii)Indebtedness incurred in connection with judgments, decrees, attachments or awards that do not constitute an Event of Default under **Section 7.01(A)(viii)** and for which no enforcement actions have been commenced;

(xix) Indebtedness in the form of reimbursements owed to officers, directors, consultants and employees of the Company or any of its Subsidiaries in the ordinary course of business;

(xx) [reserved];

(xxi) additional Subordinated Indebtedness (and any Permitted Refinancing Indebtedness to refinance such Subordinated Indebtedness) that does not exceed ten million dollars ($10,000,000) at any time outstanding; and

(xxii) Swap Agreements not entered into for speculative purposes.

(C)For purposes of determining compliance with this **Section 3.09**, in the event that an item of proposed Indebtedness or Disqualified Stock meets the criteria of more than one of the categories of Permitted Debt described above, the Company will be permitted to classify all or a portion of such item of Indebtedness or Disqualified Stock on the date of its incurrence, or later reclassify all or a portion of such item of Indebtedness or Disqualified Stock (based on circumstances existing on the date of reclassification), in any manner that complies with this covenant. The accrual of interest, the accrual of dividends, the accretion or amortization of original issue discount, the amortization of debt discount, the payment of interest on any Indebtedness in the form of additional Indebtedness, the payment of interest in the form of additional shares of preferred Capital Stock or Disqualified Stock, the reclassification of Preferred Stock as

Indebtedness due to a change in accounting principles, and the payment of dividends on Disqualified Stock in the form of additional shares of the same class of Disqualified Stock will not be deemed to be an incurrence of Indebtedness or an issuance of Disqualified Stock for purposes of this covenant.

(D)The accrual of interest or dividends, the accretion of accreted value, the accretion or amortization of original issue discount and the payment of interest or dividends in the form of additional Indebtedness, Disqualified Stock or Preferred Stock and increases in the amount of Indebtedness outstanding solely as a result of fluctuations in the exchange rate of currencies, in each case, will not be deemed to be an incurrence of Indebtedness, Disqualified Stock or Preferred Stock for purposes of this Section 3.09.

(E)For purposes of determining compliance with any U.S. dollar-denominated restriction on the incurrence of Indebtedness, the U.S. dollar-equivalent principal amount of Indebtedness denominated in a foreign currency shall be calculated based on the relevant currency exchange rate in effect on the date such Indebtedness was incurred, in the case of term Indebtedness, or first committed, in the case of revolving credit Indebtedness; *provided* that if such Indebtedness is incurred to refinance other Indebtedness denominated in a foreign currency, and such refinancing would cause the applicable U.S. dollar-denominated restriction to be exceeded if calculated at the relevant currency exchange rate in effect on the date of such refinancing, such U.S. dollar-denominated restriction shall be deemed not to have been exceeded so long as the principal amount of such Permitted Refinancing Indebtedness does not exceed the principal amount of such Indebtedness being refinanced. Notwithstanding any other provision of this **Section 3.09**, the maximum amount of Indebtedness that the Company may incur pursuant to this **Section 3.09** shall not be deemed to be exceeded solely as a result of fluctuations in the exchange rate of currencies. The principal amount of any Indebtedness incurred to refinance other Indebtedness, if incurred in a different currency from the Indebtedness being refinanced, shall be calculated based on the currency exchange rate applicable to the currencies in which such Permitted Refinancing Indebtedness is denominated that is in effect on the date of such refinancing.

(F)The **Section 3.09** will cease to apply from and after the date, if at all, on which the Company exercises its Covenant Defeasance right pursuant to **Section 9.04**.

SECTION 3.10.LIMITATION ON LIENS.

(A)The Company shall not, nor will it permit any of its Subsidiaries to, directly or indirectly, create, incur, assume or suffer to exist any Lien to secure Indebtedness on any property, asset or right now owned or hereafter acquired by the Company or any of its Subsidiaries, except for Permitted Liens.

(B)The **Section 3.10** will cease to apply from and after the date, if at all, on which the Company exercises its Covenant Defeasance right pursuant to **Section 9.04**.

SECTION 3.11.LIMITATION ON RESTRICTED PAYMENTS.

(A)The Company will not, and the Company will not permit any of its Subsidiaries to:

(i) declare or pay any dividend or make any payment or distribution (x) on account of the Company's or any of its Subsidiaries' Capital Stock, (including any payment made in connection with any merger or consolidation involving the Company or any of its Subsidiaries) or (y) to the direct or indirect holders of the Company's or any of its Subsidiaries' Capital Stock in their capacity as holders, other than (A) dividends or distributions by the Company payable solely in Capital Stock (other than Disqualified Stock) of the Company or (B) dividends or distributions by the Company or any of its Subsidiaries to the Company or another Subsidiary of the Company (and in the case of any dividend or distribution payable on or in respect of any class or series of securities issued by a Subsidiary of the Company other than a Wholly Owned Subsidiary of the Company, the Company or a Subsidiary of the Company receives at least its pro rata share of such dividend or distribution in accordance with its Capital Stock in such class or series of securities);

(ii) purchase, redeem, defease or otherwise acquire or retire for value (including any payment made in connection with any merger or consolidation involving the Company or any of its Subsidiaries) any Capital Stock of the Company or any Subsidiary held by Persons other than the Company or any Subsidiary;

(iii) purchase, repay, prepay, repurchase, redeem, defease, acquire or retire for value any Subordinated Indebtedness, except any payment of principal at the stated maturity thereof;

(iv) make any Investment other than a Permitted Investment (a "**Restricted Investment**")

(all such payments and other actions set forth in clauses (i) through (iii) above being collectively referred to as "**Restricted Payments**").

(B)Notwithstanding anything to the contrary contain herein, the provisions of this **Section 3.11** will not prohibit:

(i) the payment of any dividend or distribution or consummation of any redemption within 60 days after the date of declaration thereof or the giving of a redemption notice related thereto, if at the date of declaration or notice such payment would have complied with any other provision of this **Section 3.11**;

(ii) the repurchase, redemption, defeasance or other acquisition or retirement for value of Subordinated Indebtedness with the net proceeds from a substantially concurrent incurrence of Permitted Refinancing Indebtedness permitted under **Section 3.09**;

(iii) the repurchase, redemption or other acquisition or retirement for value of the Company's existing 7.25% Convertible Senior Notes due 2025;

(iv) cashless repurchases of Capital Stock deemed to occur upon the exercise of stock options, warrants or other securities convertible into or exercisable or exchangeable

for Capital Stock if such Capital Stock represents a portion of the exercise, conversion or exchange price thereof;

(v) any purchase, repurchase, redemption, defeasance or other acquisition or retirement for value of unsecured Indebtedness or Disqualified Stock of the Company or any Subsidiary upon a Fundamental Change or Asset Sale or analogous construct contained in the instrument pursuant to which such Indebtedness or Disqualified Stock was issued pursuant to a provision no more favorable, including purchase price, to the holders thereof than the provisions set forth under **Section 4.02** and **Section 3.12**, as applicable, but only if the Company or such Subsidiary has first complied with its obligations under **Section 4.02** and **Section 3.12**, as applicable;

(vi) each Subsidiary of the Company may make Restricted Payments to the Company or another Subsidiary of the Company which is the immediate parent of the Subsidiary making such Restricted Payment;

(vii) repurchases of Capital Stock deemed to occur upon the withholding of a portion of Capital Stock granted or awarded to a current or former director, officer, employee, manager or director of the Company or any of its Subsidiaries (or consultant or advisor or any spouses, former spouses, successors, executors, administrators, heirs, legatees or distributees of any of the foregoing) solely to the extent necessary to pay for the taxes payable by such Person upon such grant or award (or upon the vesting thereof);

(viii) the making of any Restricted Payment in exchange for, or out of or with the net cash proceeds from the substantially concurrent contribution to the common equity of the Company or from the substantially concurrent sale (other than to a Subsidiary of the Company) of, Capital Stock (other than Disqualified Stock) of the Company to the extent such proceeds are not otherwise applied to the making of Restricted Payments pursuant to this **Section 3.11**;

(ix) the making of cash payments in connection with any conversion or redemption of the Notes or the Existing Convertible Notes, in each case, pursuant to the terms of this Indenture or the Existing Convertible Notes Indenture, as applicable;

(x) payments on any Subordinated Indebtedness, the incurrence of which was permitted under **Section 3.09**, in accordance with the terms of the applicable intercreditor agreement;

(xi) any non-Wholly Owned Subsidiary of the Company may make Restricted Payments (which may be in cash) to its shareholders, members or partners generally, so long as the Company or the Subsidiary which owns the Capital Stock in the Subsidiary making such Restricted Payment receives at least its proportionate share thereof (based upon its relative holding of the Capital Stock in the Subsidiary making such Restricted Payment and taking into account the relative preferences, if any, of the various classes of Capital Stock of such Subsidiary); and

(xii) the payment of cash in lieu of the issuance of fractional shares of Capital Stock in connection with any dividend or split of, or upon exercise, conversion or exchange

of warrants, options or other securities exercisable or convertible into, or exchangeable for Capital Stock of the Company or in connection with the issuance of any dividend otherwise permitted to be made under this **Section 3.11**.

(C)For purposes of determining compliance with this **Section 3.11**, if any Restricted Payment (or portion thereof) would be permitted pursuant to one or more provisions described above, the Company may divide and classify such Restricted Payment in any manner that complies with this covenant and may later divide and classify any such Restricted Payment so long as the Restricted Payment (as so divided and/or reclassified) would be permitted to be made in reliance on the applicable exception as of the date of such reclassification.

(D)The **Section 3.11** will cease to apply from and after the date, if at all, on which the Company exercises its Covenant Defeasance right pursuant to **Section 9.04**.

SECTION 3.12.LIMITATION ON ASSET SALES.

(A)The Company will not, and will not permit any of its Subsidiaries to, consummate an Asset Sale (including, for the avoidance of doubt, any Royalty Financing or any other event giving rise to or resulting in IP Monetization Proceeds), unless (i) the Company (or the Subsidiary, as the case may be) receives consideration at the time of the Asset Sale at least equal to the Fair Market Value (measured as of the date of the definitive agreement with respect to such Asset Sale) of the assets, property or Capital Stock issued or sold or otherwise disposed of, (ii) no Default or Event of Default shall have occurred and be continuing at the time of the consummation of such Asset Sale or would be caused thereby and (iii) at least 75% of the consideration received from such Asset Sale is, or will be when paid (in the case of milestones, royalties and other deferred payment obligations), in the form of cash or Cash Equivalents. No Material Intellectual Property or exclusive license in any Material Intellectual Property shall be permitted to be transferred by the Company or any of the Guarantors to, or held by, any Affiliate or Subsidiary which is not a Guarantor or, without the consent of the Required Holders, any other Person, whether by transfer or disposition, other than non-exclusive licenses in the ordinary course of business.

(B)Within ten Business Days after the receipt of any IP Monetization Proceeds (other than, for the avoidance of doubt, Excluded Proceeds), the Company will make an offer (each, an "**IP Sale Offer**") to all Holders of Notes, to purchase, prepay or redeem the maximum principal amount of Notes that may be purchased in accordance with the chart set forth below (the "**IP Offer Amount**"). The offer price in any Asset Sale Offer will be an amount in cash equal to 100% of the aggregate principal amount purchased, prepaid or redeemed, plus accrued and unpaid interest on such principal amount to the date of purchase, unless such date of purchase falls after a Regular Record Date but on or prior to the Interest Payment Date to which such Regular Record Date relates, in which case the Company shall instead pay the full amount of any accrued and unpaid interest to Holders of record as of such Regular Record Date and the offer price in such IP Sale Offer shall be an amount in cash equal to 100% of the aggregate principal amount purchased, prepaid or redeemed. If the aggregate principal amount of Notes tendered in or required to be prepaid or redeemed in connection with such IP Sale Offer exceeds the IP Offer Amount, the Company will select the Notes to be purchased, prepaid or redeemed on a pro rata basis (subject to adjustment to maintain the authorized minimum denomination of the Notes), based on the amounts tendered or required to be prepaid or redeemed. For the avoidance of doubt, upon receipt

of any IP Monetization Proceeds, the applicable IP Offer Amount set forth in the table below shall apply to all IP Monetization Proceeds measured in the aggregate since the Issue Date, it being understood that the foregoing shall require the Company, if applicable, to provide in certain cases of an IP Sale Offer an IP Offer Amount in excess of the immediately applicable amount set forth in the table below, such that the IP Offer Amount, in the aggregate since the Issue Date, shall conform to the requirements of the table below in respect of the aggregate amount of IP Monetization Proceeds since the Issue Date.

Amount of IP Monetization Proceeds (in the aggregate since the Issue Date)	≥$5 million but < $10 million	≥$10 million but < $15 million	≥$15 million but < $20 million	≥$20 million but < $25 million	≥$25 million but < $30 million	≥$30 million but < $35 million	≥$35 million but < $40 million	≥$40 million but < $45 million	≥$45 million but < $50 million	≥$50 million
IP Offer Amount (as a percentage of the IP Monetization Proceeds)	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%

(C)Within ten Business Days after the receipt of any Net Proceeds (other than IP Monetization Proceeds or Excluded Proceeds), the Company will make an offer (each, an "**Asset Sale Offer**") to all Holders of Notes, to purchase, prepay or redeem the maximum principal amount of Notes after deducting from such Net Proceeds all accrued and unpaid interest on the Notes and the amount of all fees and expenses, including premiums, incurred in connection with such purchase, prepayment or redemption (the "**Offer Amount**"). The offer price in any Asset Sale Offer will be an amount in cash equal to 100% of the aggregate principal amount purchased, prepaid or redeemed, plus accrued and unpaid interest on such principal amount to the date of purchase, unless such date of purchase falls after a Regular Record Date but on or prior to the Interest Payment Date to which such Regular Record Date relates, in which case the Company shall instead pay the full amount of any accrued and unpaid interest to Holders of record as of such Regular Record Date and the offer price in such Asset Sale Offer shall be an amount in cash equal to 100% of the aggregate principal amount purchased, prepaid or redeemed. If the aggregate principal amount of Notes tendered in or required to be prepaid or redeemed in connection with such Asset Sale Offer exceeds the Offer Amount, the Company will select the Notes to be purchased, prepaid or redeemed on a pro rata basis (subject to adjustment to maintain the authorized minimum denomination of the Notes), based on the amounts tendered or required to be prepaid or redeemed.

(D)To the extent applicable, the Company will comply with all federal and state securities laws in connection with an Asset Sale Offer or IP Sale Offer (including complying with Rules 13e-4 and 14e-1 under the Exchange Act and filing any required Schedule TO, to the extent applicable) so as to permit effecting such Asset Sale Offer or IP Sale Offer in the manner set forth in this Indenture. To the extent that the provisions of any applicable federal or state securities laws

conflict with the provisions of this **Section 3.12**, the Company will comply with the applicable securities laws and will not be deemed to have breached its obligations under this **Section 3.12** by virtue of such compliance.

(E)The **Section 3.12** will cease to apply from and after the date, if at all, on which the Company exercises its Covenant Defeasance right pursuant to **Section 9.04**.

SECTION 3.13.TRANSACTIONS WITH AFFILIATES

(A)The Company will not, and will not permit any of its Subsidiaries to, directly or indirectly, make any payment to, or sell, lease, transfer or otherwise dispose of any of its properties or assets to, or purchase any property or assets from, or enter into or make or amend any transaction or series of transactions, contract, agreement, understanding, loan, advance or guarantee with, or for the benefit of, any Affiliate of the Company or any of its Subsidiaries (each, an "**Affiliate Transaction**") involving aggregate payments or consideration in excess of $50,000, unless:

(i) the Affiliate Transaction is on terms that are not materially less favorable to the Company or the relevant Subsidiary, taken as a whole, than those that would have been obtained in a comparable arms-length transaction by the Company or such Subsidiary with a Person that is not an Affiliate of the Company or any of its Subsidiaries; and

(ii) the Company delivers to the Trustee, with respect to any Affiliate Transaction or series of related Affiliate Transactions involving aggregate payments or consideration in excess of $100,000, a resolution of the Board of Directors accompanied by an Officer's Certificate certifying that such Affiliate Transaction complies with this **Section 3.13** and that such Affiliate Transaction has been approved by a majority of the disinterested members of the Board of Directors;

(B)The following items will be deemed not to be Affiliate Transactions and, therefore, will not be subject to the provisions of **Section 3.13**:

(i) the Notes and the Guarantees;

(ii) any consulting or employment agreement or compensation plan, stock option or stock ownership plan or reasonable and customary officer or director indemnification arrangement entered into by the Company or any of its Subsidiaries in the ordinary course of business for the benefit of directors, officers, employees and consultants of the Company or its Subsidiaries and payments and transactions pursuant thereto;

(iii) transactions between or among the Company and/or its Subsidiaries;

(iv) payment of reasonable fees or other reasonable compensation to, provision of customary benefits or indemnification agreements to and reimbursement of expenses of directors, officer and employees of the Company or any of its Subsidiaries;

(v) any transaction in which the only consideration paid by the Company or any Subsidiary consists of Capital Stock (other than Disqualified Stock) of the Company or any contribution of capital to the Company;

(vi) Restricted Payments that do not violate the provisions of **Section 3.11** of this Indenture and Indebtedness that does not violate the provisions of **Section 3.09** of this Indenture;

(vii) transactions pursuant to agreements or arrangements as in effect on the Issue Date, or any amendment, modification, or supplement thereto or replacement thereof (so long as such agreement or arrangement, as so amended, modified or supplemented or replaced, is not materially more disadvantageous, taken as a whole, than such agreement or arrangement as in effect on the Issue Date, as determined in good faith by the Company);

(viii) purchases or sales of goods or services with customers, suppliers, sales agents or sellers of goods and services in the ordinary course of business on terms that are no less favorable to the Company or the relevant Subsidiary than those that would have been obtained at the time in a comparable transaction by the Company or such Subsidiary with a Person that is not an Affiliate of the Company;

(ix) if such Affiliate Transaction is with an Affiliate in its capacity as a holder of Indebtedness of the Company or any Subsidiary, a transaction in which such Affiliate is treated no more favorably than the other non-Affiliated holders of Indebtedness of the Company or such Subsidiary;

(x) transactions in the ordinary course of business between the Company or a Subsidiary with any joint venture; *provided* that all the outstanding ownership interests of such joint venture are owned only by the Company, its Subsidiaries and Persons that are not Affiliates of the Company (other than by virtue of such joint venture arrangement);

(xi) any Investment of the Company or any of its Subsidiaries existing on the Issue Date, and any extension, modification or renewal of such existing Investments, to the extent not involving any additional Investment other than as the result of the accrual or accretion of interest or original issue discount or the issuance of pay-in-kind securities, in each case, pursuant to the terms of such Investments as in effect on the Issue Date;

(xii) the formation and maintenance of any consolidated group or subgroup for tax, accounting or cash pooling or management purposes in the ordinary course of business or transactions undertaken in good faith for the purpose of improving the consolidated tax efficiency of the Company or any of their Subsidiaries and not for the purpose of circumventing any provision of this Indenture;

(xiii) to the extent permitted under this Indenture, any merger, consolidation or reorganization of the Company with an Affiliate of the Company solely for the purpose of (A) forming or collapsing a holding company structure or (B) reincorporating the Company in a new jurisdiction;

(xiv) entering into one or more agreements that provide registration or information rights to the security holders of the Company or any Subsidiary or any direct or indirect parent of the Company or amending such agreement with security holders of the Company or any Subsidiary or any direct or any indirect parent of the Company;

(xv) transactions contemplated by, or in connection with, any customary transition services agreement entered into in connection with any Disposition which is permitted hereunder;

(xvi) customary fees, indemnities and reimbursements may be paid to non-officer directors of the Company and its Subsidiaries; and

(xvii) the issuance, sale or transfer of Capital Stock (other than Disqualified Stock) of the Company, and any contribution to the capital of the Company;

(xviii)advances to employees of the Company or any of its Subsidiaries made in the ordinary course of business, in a manner that is consistent with past practice.

(C)The **Section 3.13** will cease to apply from and after the date, if at all, on which the Company exercises its Covenant Defeasance right pursuant to **Section 9.04**.

SECTION 3.14.MINIMUM LIQUIDITY.

The Company shall not permit the amount of cash and Cash Equivalents to be less than $4 million. The **Section 3.14** will cease to apply from and after the date, if at all, on which the Company exercises its Covenant Defeasance right pursuant to **Section 9.04**.

SECTION 3.15.COVENANT TO GIVE SECURITY.

Subject to the applicable limitations set forth in this Indenture and the other Notes Documents (including with respect to Excluded Assets (as defined in the Security Agreement)), the Company shall, and shall cause each Guarantor to, execute any and all further documents, financing statements, agreements and instruments, and take all further action that may be required under applicable law or any Notes Document, or that the Collateral Agent may reasonably request (at the direction of the Required Holders), in order to grant, preserve, protect and perfect the validity and priority of the security interests created or intended to be created by the Collateral Documents in the Collateral. Subject to the applicable limitations set forth in the Collateral Documents and this Indenture (including with respect to Excluded Assets (as defined in the Security Agreement)), if the Company or any Guarantor acquires property that does not automatically become subject to a perfected security interest under the Collateral Documents, then, in each case, the Company will, and will cause such Guarantor to, provide security in favor of the Collateral Agent over such acquired property to the extent that such property or assets would constitute Collateral under the Collateral Documents, and deliver certain joinder agreements or supplements, mortgages, deeds of trust, financing statements and certificates, title insurance policies, surveys, opinions of local counsel and other documents as required by this Indenture and the Collateral Documents, in each case, within 120 days after such obligations arise hereunder or as soon as practicable thereafter using commercially reasonably efforts as determined in good faith by the Company.

SECTION 3.16.FUTURE GUARANTORS.

If, after the date of this Indenture, the Company or any Subsidiary of the Company forms or acquires any Subsidiary (other than any Excluded Subsidiary), or any Subsidiary of the

Company that is an Excluded Subsidiary ceases to be an Excluded Subsidiary, then the Company shall cause such Subsidiary to, within 60 days (or such longer period as the Required Holders may agree in their sole discretion) after the date of such event:

(i) execute and deliver to the Trustee and the Collateral Agent a supplemental indenture in the form attached hereto as Exhibit C pursuant to which such Subsidiary shall unconditionally guarantee all of the Guaranteed Obligations on the terms set forth in this Indenture;

(ii) execute and deliver all supplements or joinders, as applicable, to the applicable Collateral Documents in order to grant a Lien in the Collateral owned by such Subsidiary to the same extent as that set forth in this Indenture and the Collateral Documents and take all actions required by the Collateral Documents to perfect such Lien; and

(iii) deliver to the Trustee and the Collateral Agent an Officer's Certificate and an Opinion of Counsel, each certifying that such supplemental indenture and the other documents described in clause (ii) above have been duly authorized, executed and delivered by such Subsidiary and constitute a valid and legally binding and enforceable obligations of such Subsidiary, subject to customary exceptions.

Thereafter, such Subsidiary shall be a Guarantor for all purposes.

Article 4.REPURCHASE AND REDEMPTION

SECTION 4.01.NO SINKING FUND.

No sinking fund is required to be provided for the Notes.

SECTION 4.02.RIGHT OF HOLDERS TO REQUIRE THE COMPANY TO REPURCHASE NOTES UPON A FUNDAMENTAL CHANGE.

(A)*Right of Holders to Require the Company to Repurchase Notes Upon a Fundamental Change*. Subject to the other terms of this **Section 4.02**, if a Fundamental Change occurs, then each Holder will have the right (the "**Fundamental Change Repurchase Right**") to require the Company to repurchase such Holder's Notes (or any portion thereof in an Authorized Denomination) on the Fundamental Change Repurchase Date for such Fundamental Change for a cash purchase price equal to the Fundamental Change Repurchase Price.

(B)*Repurchase Prohibited in Certain Circumstances*. If the principal amount of the Notes has been accelerated and such acceleration has not been rescinded on or before the Fundamental Change Repurchase Date for a Repurchase Upon Fundamental Change (including as a result of the payment of the related Fundamental Change Repurchase Price, and any related interest pursuant to the proviso to **Section 4.02(D)**, on such Fundamental Change Repurchase Date), then (i) the Company may not repurchase any Notes pursuant to this **Section 4.02**; and (ii) the Company will cause any Notes theretofore surrendered for such Repurchase Upon Fundamental Change to be returned to the Holders thereof (or, if applicable with respect to Global Notes, cancel any instructions for book-entry transfer to the Company, the Trustee or the Paying

Agent of the applicable beneficial interest in such Notes in accordance with the Depositary Procedures).

(C)*Fundamental Change Repurchase Date*. The Fundamental Change Repurchase Date for any Fundamental Change will be a Business Day of the Company's choosing that is no more than thirty five (35), nor less than twenty (20), Business Days after the date the Company sends the related Fundamental Change Notice pursuant to **Section 4.02(E)**.

(D)*Fundamental Change Repurchase Price*. The Fundamental Change Repurchase Price for any Note to be repurchased upon a Repurchase Upon Fundamental Change following a Fundamental Change is an amount in cash equal to the principal amount of such Note plus accrued and unpaid interest calculated at the Cash Interest Rate on such Note to, but excluding, the Fundamental Change Repurchase Date for such Fundamental Change; *provided*, *however*, that if such Fundamental Change Repurchase Date is after a Regular Record Date and on or before the next Interest Payment Date, then (i) the Holder of such Note at the Close of Business on such Regular Record Date will be entitled, notwithstanding such Repurchase Upon Fundamental Change, to receive, on or, at the Company's election, before such Interest Payment Date, the unpaid interest that would have accrued on such Note to, but excluding, such Interest Payment Date (assuming, solely for these purposes, that such Note remained outstanding through such Interest Payment Date, if such Fundamental Change Repurchase Date is before such Interest Payment Date); and (ii) the Fundamental Change Repurchase Price will not include accrued and unpaid interest on such Note to, but excluding, such Fundamental Change Repurchase Date. For the avoidance of doubt, if an Interest Payment Date is not a Business Day within the meaning of **Section 2.05(C)** and such Fundamental Change Repurchase Date occurs on the Business Day immediately after such Interest Payment Date, then (x) accrued and unpaid interest on Notes to, but excluding, such Interest Payment Date will be paid, in accordance with **Section 2.05(C)**, on the next Business Day to Holders as of the Close of Business on the immediately preceding Regular Record Date; and (y) the Fundamental Change Repurchase Price will include interest on Notes to be repurchased from, and including, such Interest Payment Date.

(E)*Fundamental Change Notice*. On or before the twentieth (20th) calendar day after the effective date of a Fundamental Change, the Company will send to each Holder, the Trustee and the Paying Agent a notice of such Fundamental Change (a "**Fundamental Change Notice**"). Substantially contemporaneously, the Company will issue a press release through such national newswire service as the Company then uses (or publish the same through such other widely disseminated public medium as the Company then uses, including its website) containing the information set forth in the Fundamental Change Notice.

Such Fundamental Change Notice must state:

(i) briefly, the events causing such Fundamental Change;

(ii) the effective date of such Fundamental Change;

(iii) the procedures that a Holder must follow to require the Company to repurchase its Notes pursuant to this **Section 4.02**, including the deadline for exercising

the Fundamental Change Repurchase Right and the procedures for submitting and withdrawing a Fundamental Change Repurchase Notice;

(iv) the Fundamental Change Repurchase Date for such Fundamental Change;

(v) the Fundamental Change Repurchase Price per $1,000 principal amount of Notes for such Fundamental Change (and, if such Fundamental Change Repurchase Date is after a Regular Record Date and on or before the next Interest Payment Date, the amount, manner and timing of the interest payment payable pursuant to the proviso to **Section 4.02(D)**);

(vi) the name and address of the Paying Agent and the Conversion Agent;

(vii) the Conversion Rate in effect on the date of such Fundamental Change Notice, the amount of the Applicable Premium for conversions with a Conversion Date of the Business Day immediately before the Fundamental Change Repurchase Date, the method of settlement of the Applicable Premium for conversions with a Conversion Date through and including the Business Day immediately before the Fundamental Change Repurchase Date and a description and quantification of any adjustments to the Conversion Rate that may result from such Fundamental Change;

(viii) that Notes for which a Fundamental Change Repurchase Notice has been duly tendered and not duly withdrawn must be delivered to the Paying Agent for the Holder thereof to be entitled to receive the Fundamental Change Repurchase Price;

(ix) that Notes (or any portion thereof) that are subject to a Fundamental Change Repurchase Notice that has been duly tendered may be converted only if such Fundamental Change Repurchase Notice is withdrawn in accordance with this Indenture; and

(x) the CUSIP and ISIN numbers, if any, of the Notes.

Neither the failure to deliver a Fundamental Change Notice nor any defect in a Fundamental Change Notice will limit the Fundamental Change Repurchase Right of any Holder or otherwise affect the validity of any proceedings relating to any Repurchase Upon Fundamental Change.

(F)*Procedures to Exercise the Fundamental Change Repurchase Right*.

(i) *Delivery of Fundamental Change Repurchase Notice and Notes to Be Repurchased*. To exercise its Fundamental Change Repurchase Right for a Note following a Fundamental Change, the Holder thereof must deliver to the Paying Agent:

(1) before the Close of Business on the Business Day immediately before the related Fundamental Change Repurchase Date (or such later time as may be required by law), a duly completed, written Fundamental Change Repurchase Notice with respect to such Note; and

(2) such Note, duly endorsed for transfer (if such Note is a Physical Note) or by book-entry transfer (if such Note is a Global Note).

The Paying Agent will promptly deliver to the Company a copy of each Fundamental Change Repurchase Notice that it receives.

(ii) *Contents of Fundamental Change Repurchase Notices*. Each Fundamental Change Repurchase Notice with respect to a Note must state:

(1) if such Note is a Physical Note, the certificate number of such Note;

(2) the principal amount of such Note to be repurchased, which must be an Authorized Denomination; and

(3) that such Holder is exercising its Fundamental Change Repurchase Right with respect to such principal amount of such Note;

provided, *however*, that if such Note is a Global Note, then such Fundamental Change Repurchase Notice must comply with the Depositary Procedures (and any such Fundamental Change Repurchase Notice delivered in compliance with the Depositary Procedures will be deemed to satisfy the requirements of this **Section 4.02(F)**) and such Holder shall take such actions as are necessary to provide instructions for book-entry transfer to the Company, the Trustee or the Paying Agent of the applicable beneficial interest in such Note in accordance with the Depositary Procedures.

(iii) *Withdrawal of Fundamental Change Repurchase Notice*. A Holder that has delivered a Fundamental Change Repurchase Notice with respect to a Note may withdraw such Fundamental Change Repurchase Notice by delivering a written notice of withdrawal to the Paying Agent at any time before the Close of Business on the Business Day immediately before the related Fundamental Change Repurchase Date. Such withdrawal notice must state:

(1) if such Note is a Physical Note, the certificate number of such Note;

(2) the principal amount of such Note to be withdrawn, which must be an Authorized Denomination; and

(3) the principal amount of such Note, if any, that remains subject to such Fundamental Change Repurchase Notice, which must be an Authorized Denomination;

provided, *however*, that if such Note is a Global Note, then such withdrawal notice must comply with the Depositary Procedures (and any such withdrawal notice delivered in compliance with the Depositary Procedures will be deemed to satisfy the requirements of this **Section 4.02(F)**) and such Holder shall take such actions as are necessary to provide instructions for book-entry transfer to the Company, the Trustee or the Paying Agent of the applicable beneficial interest in such Note in accordance with the Depositary Procedures.

Upon receipt of any such withdrawal notice with respect to a Note (or any portion thereof), the Paying Agent will (x) promptly deliver a copy of such withdrawal notice to the Company; and (y) if such Note is surrendered to the Paying Agent, the Company shall cause such Note (or such portion thereof in accordance with **Section 2.11**, treating such Note as having been then surrendered for partial repurchase in the amount set forth in such withdrawal notice as remaining subject to repurchase) to be returned to the Holder thereof (or, if applicable with respect to any Global Note, cancel any instructions for book-entry transfer to the Company, the Trustee or the Paying Agent of the applicable beneficial interest in such Note in accordance with the Depositary Procedures).

(G)*Payment of the Fundamental Change Repurchase Price*. Without limiting the Company's obligation to deposit the Fundamental Change Repurchase Price within the time proscribed by **Section 3.01(B)**, the Company will cause the Fundamental Change Repurchase Price for a Note (or portion thereof) to be repurchased pursuant to a Repurchase Upon Fundamental Change to be paid to the Holder thereof on or before the later of (i) the applicable Fundamental Change Repurchase Date; and (ii) the date (x) such Note is delivered to the Paying Agent (in the case of a Physical Note) or (y) the Depositary Procedures relating to the repurchase, and the delivery to the Paying Agent, of such Holder's beneficial interest in such Note to be repurchased are complied with (in the case of a Global Note). For the avoidance of doubt, interest payable pursuant to the proviso to **Section 4.02(D)** on any Note to be repurchased pursuant to a Repurchase Upon Fundamental Change must be paid pursuant to such proviso regardless of whether such Note is delivered or such Depositary Procedures are complied with pursuant to the first sentence of this **Section 4.02(G)**.

(H)*Compliance with Applicable Securities Laws*. To the extent applicable, the Company will comply with all federal and state securities laws in connection with a Repurchase Upon Fundamental Change (including complying with Rules 13e-4 and 14e-1 under the Exchange Act and filing any required Schedule TO, to the extent applicable) so as to permit effecting such Repurchase Upon Fundamental Change in the manner set forth in this Indenture. To the extent that the provisions of any applicable federal or state securities laws conflict with the provisions of this **Section 4.02**, the Company will comply with the applicable securities laws and will not be deemed to have breached its obligations under this **Section 4.02** by virtue of such compliance.

(I) *Repurchase in Part*. Subject to the terms of this **Section 4.02**, Notes may be repurchased pursuant to a Repurchase Upon Fundamental Change in part, but only in Authorized Denominations. Provisions of this **Section 4.02** applying to the repurchase of a Note in whole will equally apply to the repurchase of a permitted portion of a Note.

SECTION 4.03.RIGHT OF THE COMPANY TO REDEEM THE NOTES.

(A)*Redemptions Before December 19, 2024*. The Company may not redeem the Notes at its option at any time before December 19, 2024, except for a Strategic Redemption Event, for a cash purchase price equal to the Redemption Price, but only if the Last Reported Sale Price per share of Common Stock exceeds one hundred and fifty percent (150%) of the Conversion Price on (i) each of at least twenty (20) Trading Days (whether or not consecutive) during the thirty (30) consecutive Trading Days ending on, and including, the Trading Day immediately before the Redemption Notice Date for such Redemption; and (ii) the Trading Day immediately before such

Redemption Notice Date.

(B)*Right to Redeem the Notes*. Subject to the terms of this **Section 4.03**, the Company has the right, at its election, to redeem all, but not less than all, of the Notes, at any time on or after December 19, 2024, for a cash purchase price equal to the Redemption Price, but only if the Last Reported Sale Price per share of Common Stock exceeds one hundred and fifty percent (150%) of the Conversion Price on (i) each of at least twenty (20) Trading Days (whether or not consecutive) during the thirty (30) consecutive Trading Days ending on, and including, the Trading Day immediately before the Redemption Notice Date for such Redemption; and (ii) the Trading Day immediately before such Redemption Notice Date.

(C)*Redemption Prohibited in Certain Circumstances*. If the principal amount of the Notes has been accelerated and such acceleration has not been rescinded on or before the Redemption Date (including as a result of the payment of the related Redemption Price, and any related interest pursuant to the proviso to **Section 4.03(E)**, on such Redemption Date), then (i) the Company may not call for Redemption or otherwise redeem any Notes pursuant to this **Section 4.03**; and (ii) the Company will cause any Notes theretofore surrendered for such Redemption to be returned to the Holders thereof (or, if applicable with respect to Global Notes, cancel any instructions for book-entry transfer to the Company, the Trustee or the Paying Agent of the applicable beneficial interests in such Notes in accordance with the Depositary Procedures).

(D)*Redemption Date*. The Redemption Date for any Redemption will be a Business Day of the Company's choosing that is no more than sixty (60), nor less than thirty (30), calendar days after the Redemption Notice Date for such Redemption.

(E)*Redemption Price*. The Redemption Price for any Note called for Redemption is an amount in cash equal to the principal amount of such Note plus accrued and unpaid interest calculated at the Cash Interest Rate on such Note to, but excluding, the Redemption Date for such Redemption; *provided*, *however*, that if such Redemption Date is after a Regular Record Date and on or before the next Interest Payment Date, then (i) the Holder of such Note at the Close of Business on such Regular Record Date will be entitled, notwithstanding such Redemption, to receive, on or, at the Company's election, before such Interest Payment Date, the unpaid interest that would have accrued on such Note to, but excluding, such Interest Payment Date (assuming, solely for these purposes, that such Note remained outstanding through such Interest Payment Date, if such Redemption Date is before such Interest Payment Date); and (ii) the Redemption Price will not include accrued and unpaid interest on such Note to, but excluding, such Redemption Date. For the avoidance of doubt, if an Interest Payment Date is not a Business Day within the meaning of **Section 2.05(C)** and such Redemption Date occurs on the Business Day immediately after such Interest Payment Date, then (x) accrued and unpaid interest on Notes to, but excluding, such Interest Payment Date will be paid, in accordance with **Section 2.05(C)**, on the next Business Day to Holders as of the Close of Business on the immediately preceding Regular Record Date; and (y) the Redemption Price will include interest on Notes to be redeemed from, and including, such Interest Payment Date. For the avoidance of doubt, the Company shall be responsible for calculating the Redemption Price and the Trustee may rely conclusively on such calculation without inquiry or investigation.

(F)*Redemption Notice*. To call any Notes for Redemption, the Company must (x) send to each Holder of such Notes, the Trustee and the Paying Agent a written notice of such Redemption (a "**Redemption Notice**"); and (y) substantially contemporaneously therewith, issue a press release through such national newswire service as the Company then uses (or publish the same through such other widely disseminated public medium as the Company then uses, including its website) containing the information set forth in the Redemption Notice.

Such Redemption Notice must state:

(i) that such Notes have been called for Redemption, briefly describing the Company's Redemption right under this Indenture and whether such redemption is a Strategic Redemption Event;

(ii) the Redemption Date for such Redemption;

(iii) the Redemption Price per $1,000 principal amount of Notes for such Redemption (and, if the Redemption Date is after a Regular Record Date and on or before the next Interest Payment Date, the amount, manner and timing of the interest payment payable pursuant to the proviso to **Section 4.03(E)**);

(iv) the name and address of the Paying Agent and the Conversion Agent;

(v) that Notes called for Redemption may be converted at any time before the Close of Business on the Business Day immediately before the Redemption Date (or, if the Company fails to pay the Redemption Price due on such Redemption Date in full, at any time until such time as the Company pays such Redemption Price in full);

(vi) the Conversion Rate in effect on the Redemption Notice Date for such Redemption, the amount of the Applicable Premium or Strategic Make-Whole, as applicable, for conversions with a Conversion Date of the Business Day immediately before the Redemption Date, the method of settlement of the Applicable Premium or Strategic Make-Whole, as applicable, for conversions with a Conversion Date in the Redemption Period and a description and quantification of any adjustments to the Conversion Rate that may result from such Redemption; and

(vii) the CUSIP and ISIN numbers, if any, of the Notes.

Two (2) Business Days before the Redemption Notice Date, the Company will send a copy of such Redemption Notice to the Trustee and the Paying Agent.

(G)*Payment of the Redemption Price*. Without limiting the Company's obligation to deposit the Redemption Price by the time proscribed by **Section 3.01(B)**, the Company will cause the Redemption Price for a Note subject to Redemption to be paid to the Holder thereof on or before the applicable Redemption Date. For the avoidance of doubt, interest payable pursuant to the proviso to **Section 4.03(E)** on any Note (or portion thereof) subject to Redemption must be paid pursuant to such proviso.

Article 5.CONVERSION

SECTION 5.01.RIGHT TO CONVERT.

(A)*Generally*. Subject to the provisions of this **Article 5**, each Holder may, at its option, convert such Holder's Notes into Conversion Consideration.

(B)*Conversions in Part*. Subject to the terms of this Indenture, Notes may be converted in part, but only in Authorized Denominations. Provisions of this **Article 5** applying to the conversion of a Note in whole will equally apply to conversions of a permitted portion of a Note.

(C)*When Notes May Be Converted*.

(i) *Generally*. A Holder may convert its Notes at any time from, and including, the Issue Date until the Close of Business on the second (2nd) Scheduled Trading Day immediately before the Maturity Date.

(ii) *Limitations and Closed Periods*. Notwithstanding anything to the contrary in this Indenture or the Notes:

(1) Notes may be surrendered for conversion only after the Open of Business and before the Close of Business on a day that is a Business Day;

(2) in no event may any Note be converted after the Close of Business on the second (2nd) Scheduled Trading Day immediately before the Maturity Date;

(3) if the Company calls any Note for Redemption pursuant to **Section 4.03**, then the Holder of such Note may not convert such Note after the Close of Business on the second (2nd) Business Day immediately before the applicable Redemption Date, except to the extent the Company fails to pay the Redemption Price for such Note in accordance with this Indenture; and

(4) if a Fundamental Change Repurchase Notice is validly delivered pursuant to **Section 4.02(F)** with respect to any Note, then such Note may not be converted, except to the extent (a) such Note is not subject to such notice; (b) such notice is withdrawn in accordance with **Section 4.02(F)**; or (c) the Company fails to pay the Fundamental Change Repurchase Price for such Note in accordance with this Indenture.

SECTION 5.02.CONVERSION PROCEDURES.

(A)*Generally*.

(i) *Global Notes*. To convert a beneficial interest in a Global Note, the owner of such beneficial interest must (1) comply with the Depositary Procedures for converting such beneficial interest (at which time such conversion will become irrevocable); and (2) pay any amounts due pursuant to **Section 5.02(D)** or **Section 5.02(F)**.

(ii) *Physical Notes*. To convert all or a portion of a Physical Note, the Holder of such Note must (1) complete, manually sign and deliver to the Conversion Agent the conversion notice attached to such Physical Note or a facsimile of such conversion notice; (2) deliver such Physical Note to the Conversion Agent (at which time such conversion will become irrevocable); (3) furnish any endorsements and transfer documents that the Company may require; and (4) pay any amounts due pursuant to **Section 5.02(D)** or **Section 5.02(F)**.

(iii) Compliance with the Depositary Procedures for converting beneficial interests in a Note or delivery of a conversion notice with respect to a Physical Note shall be referred to as a "**Notice of Conversion**."

(B)*Effect of Converting a Note*. At the Close of Business on the Conversion Date for a Note (or any portion thereof) to be converted, such Note (or such portion) will (unless there occurs a Default in the delivery of the Conversion Consideration or interest due, pursuant to **Section 5.03(A)** or **5.02(D)**, upon such conversion) be deemed to cease to be outstanding (and, for the avoidance of doubt, no Person will be deemed to be a Holder of such Note (or such portion thereof) as of the Close of Business on such Conversion Date), except to the extent provided in **Section 5.02(D)**.

(C)*Holder of Record of Conversion Shares*. The Person in whose name any share of Common Stock is issuable upon conversion of any Note will be deemed to become the holder of record of such share as of the Close of Business on the Conversion Date for such conversion.

(D)*Interest Payable upon Conversion in Certain Circumstances*. If the Conversion Date of a Note is after a Regular Record Date and before the next Interest Payment Date, then the Holder of such Note at the Close of Business on such Regular Record Date will be entitled, notwithstanding such conversion, to receive, on or, at the Company's election, before such Interest Payment Date, the unpaid interest that would have accrued on such Note to, but excluding, such Interest Payment Date (assuming, solely for these purposes, that such Note remained outstanding through such Interest Payment Date) in cash at the Cash Interest Rate.

(E)For the avoidance of doubt, if the Conversion Date of a Note to be converted is on an Interest Payment Date, then the Holder of such Note at the Close of Business on the Regular Record Date immediately before such Interest Payment Date will be entitled to receive, on such Interest Payment Date, the unpaid interest that has accrued on such Note to, but excluding, such Interest Payment Date in cash at the Cash Interest Rate.

(F)*Taxes and Duties*. If a Holder converts a Note, the Company will pay any documentary, stamp or similar issue or transfer tax or duty due on the issue or delivery of any shares of Common Stock upon such conversion; *provided*, *however*, that if any tax or duty is due because such Holder requested such shares to be registered in a name other than such Holder's name, then such Holder will pay such tax or duty and, until having received a sum sufficient to pay such tax or duty, the Company may refuse to deliver any such shares to be issued in a name other than that of such Holder.

(G)*Conversion Agent to Notify Company of Conversions*. If any Physical Note is submitted for conversion to the Conversion Agent and the Conversion Agent receives any notice of conversion with respect to a Physical Note, then the Conversion Agent will promptly (and, in any event, no later than two (2) Business Days following the date the Conversion Agent receives such Physical Note or notice) notify the Company and the Trustee of such occurrence, together with any other information in the possession of the Conversion Agent and reasonably requested by the Company, and will forward such notice and the Physical Note to the Company (or its designated agent) for purposes of the conversion. The Conversion Agent shall have no other duties or obligations with respect to the conversion of such Physical Note.

SECTION 5.03.SETTLEMENT UPON CONVERSION.

(A)*Conversion Consideration*.

(i) *Generally*. Subject to **Section 5.03(A)(ii)** and **Section 5.03(A)(iv)**, the type and amount of consideration (the "**Conversion Consideration**") due in respect of each $1,000 Capitalized Principal Amount of a Note to be converted will be:

(1) a number of shares of Common Stock equal to the Conversion Rate for such conversion; plus

(2) the Applicable Premium or, if applicable, the Strategic Make-Whole (but, for the avoidance of doubt, Holders shall not be entitled to receive both the Applicable Premium and Strategic Make-Whole with respect to any conversion);

(ii) *Settlement of Applicable Premium or Additional Shares*. Upon conversion of any Note, the Company shall satisfy its obligation to pay the Applicable Premium or Strategic Make-Whole, as applicable, by paying or delivering, as the case may be, to the converting Holder, in respect of each $1,000 Capitalized Principal Amount of Notes being converted, cash ("**Cash Settlement**"), shares of Common Stock ("**Physical Settlement**") or a combination of cash and shares of Common Stock ("**Combination Settlement**"), at its election, as set forth in this **Section 5.03**. If the Company elects a settlement method with respect to the Applicable Premium or Strategic Make-Whole other than Physical Settlement or the method specified in the most recent Settlement Notice, the Company shall deliver a written notice (the "**Settlement Notice**") of the Settlement Method so elected in respect of Conversion Dates occurring on or after the twelfth Business Day following the date of such Settlement Notice to Holders (with a copy to the Trustee and the Conversion Agent (if other than the Trustee)). Any Settlement Notice shall specify the relevant Settlement Method and in the case of an election of Combination Settlement, the relevant Settlement Notice shall indicate the proportion of cash and shares of Common Stock to be delivered. In the event that the Company settles the Applicable Premium or Strategic Make-Whole for any conversion by Physical Settlement or Combination Settlement, then the number of shares of Common Stock delivered shall be an amount equal to the amount of the Applicable Premium or Strategic Make-Whole or portion thereof to be settled in shares of Common Stock divided by the Applicable Share Price.

Notwithstanding anything to the contrary herein, the Company may not elect Cash Settlement or Combination Settlement with respect to any conversion (and shall be deemed to have elected Physical Settlement) to the extent that the cash payment therein would reduce the Applicable Premium or Strategic Make-Whole otherwise payable in respect of such conversion pursuant to the proviso contained in **Section 5.03(A)(i)**, but an election for Physical Settlement would not result in such a reduction.

(iii) *Cash in Lieu of Fractional Shares*. If the number of shares of Common Stock deliverable pursuant to **Section 5.03(A)(i)** or **(ii)** upon conversion of any Note is not a whole number, then such number will be rounded down to the nearest whole number and the Company will deliver, in addition to the other consideration due upon such conversion, cash in lieu of the related fractional share in an amount equal to the product of (1) such fraction and (2) the Last Reported Sale Price per share of Common Stock on the Conversion Date for such conversion (or, if such Conversion Date is not a Trading Day, the immediately preceding Trading Day).

(iv) *Conversion of Multiple Notes by a Single Holder*. If a Holder converts more than one (1) Note on a single Conversion Date, then the Conversion Consideration due in respect of such conversion will (in the case of any Global Note, to the extent permitted by, and practicable under, the Depositary Procedures) be computed based on the total Capitalized Principal Amount of Notes converted on such Conversion Date by such Holder.

(v) *Calculations for Principal Amounts Less than $1,000*. For any calculation of the Conversion Rate or Applicable Premium or Strategic Make-Whole with respect to less than $1,000 Capitalized Principal Amount of Notes, the Conversion Rate and Applicable Premium or Strategic Make-Whole shall be appropriately adjusted.

(B)*Delivery of the Conversion Consideration*. Except as set forth in **Section 5.05(D)**, the Company will pay or deliver, as applicable, the Conversion Consideration due upon the conversion of any Note to the Holder on the second (2nd) Business Day immediately after the Conversion Date for such conversion; *provided*, *however*, that if a Note is converted with a Conversion Date that is after the Regular Record Date occurring immediately before the Maturity Date, then, solely for purposes of such conversion, (x) the Company will pay or deliver, on the Maturity Date (or, if the Maturity Date is not a Business Day, the next Business Day), the Conversion Consideration due upon such conversion; and (y) the Conversion Date will instead be deemed to be the second (2nd) Business Day immediately before the Maturity Date.

(C)*Deemed Payment of Principal and Interest; Settlement of Accrued Interest Notwithstanding Conversion*. If a Holder converts a Note, then the Company will not adjust the Conversion Rate to account for any accrued and unpaid interest on such Note, and, except as provided in **Section 5.02(D)**, and without limiting the Company's obligation to pay the Applicable Premium or Strategic Make-Whole, as applicable, in connection with the conversion of any Note, the Company's delivery of the Conversion Consideration due in respect of such conversion will be deemed to fully satisfy and discharge the Company's obligation to pay the principal of, and accrued and unpaid interest, if any, on, such Note to, but excluding the Conversion Date. As a result, except as provided in **Section 5.02(D)**, any accrued and unpaid interest on a converted Note will be deemed to be paid in full rather than cancelled, extinguished or forfeited.

(D)*Applicable Premium or Strategic Make-Whole*.

(i) The Applicable Premium will be payable in accordance with Section 5.03(A)(ii) for all conversions of Notes other than if such conversion is in connection with a Strategic Redemption Event, where the Strategic Make-Whole will be payable in accordance with Section 5.03(A)(ii).

(ii) A conversion of the Notes by a Holder shall be deemed for purposes of this 5.03(D) to be "in connection with" a Strategic Redemption Event only if the Conversion Date occurs on or following the Redemption Notice Date of the Strategic Redemption Event but before the close of business on the Scheduled Trading Day immediately preceding the related Redemption Date.

(iii) The Notes shall not be entitled to receive both the Strategic Make-Whole and the Applicable Premium in connection with any conversion. Accordingly, notwithstanding anything to the contrary in this Indenture or the Notes, if a conversion is "in connection with" a Strategic Redemption Event, such Holder shall receive the Strategic Make-Whole and not the Applicable Premium.

SECTION 5.04.RESERVE AND STATUS OF COMMON STOCK ISSUED UPON CONVERSION.

(A)*Stock Reserve*. At all times when any Notes are outstanding, the Company will reserve (out of its authorized but unissued shares of Common Stock that are not reserved for other purposes) a number of shares of Common Stock sufficient to permit the conversion of all then-outstanding Notes assuming the maximum Strategic Make-Whole or Applicable Premium in effect from time to time, and the Minimum Price.

(B)*Status of Conversion Shares; Listing*. Each Conversion Share delivered upon conversion of any Note will be a newly issued or treasury share (except that any Conversion Share delivered by a designated financial institution pursuant to **Section 5.08** need not be a newly issued or treasury share) and will be duly and validly issued, fully paid, non-assessable, free from preemptive rights and free of any lien or adverse claim (except to the extent of any lien or adverse claim created by the action or inaction of the Holder of such Note or the Person to whom such Conversion Share will be delivered). If the Common Stock is then listed on any securities exchange, or quoted on any inter-dealer quotation system, then the Company will use commercially reasonable efforts to cause each Conversion Share, when delivered upon conversion of any Note, to be admitted for listing on such exchange or quotation on such system.

SECTION 5.05.ADJUSTMENTS TO THE CONVERSION RATE.

(A)*Events Requiring an Adjustment to the Conversion Rate*. The Conversion Rate will be adjusted from time to time as follows:

(i) *Stock Dividends, Splits and Combinations*. If the Company issues solely shares of Common Stock as a dividend or distribution on all or substantially all shares of the Common Stock, or if the Company effects a stock split or a stock combination of the Common Stock (in each case excluding an issuance solely pursuant to a Common Stock

Change Event, as to which **Section 5.09** will apply), then the Conversion Rate will be adjusted based on the following formula:

$$CR_1 = CR_0 \cdot \frac{OS_1}{OS_0}$$

where:

CR_0 = the Conversion Rate in effect immediately before the Open of Business on the Ex-Dividend Date for such dividend or distribution, or immediately before the Open of Business on the effective date of such stock split or stock combination, as applicable;

CR_1 = the Conversion Rate in effect immediately after the Open of Business on such Ex-Dividend Date or effective date, as applicable;

OS_0 = the number of shares of Common Stock outstanding immediately before the Open of Business on such Ex-Dividend Date or effective date, as applicable, without giving effect to such dividend, distribution, stock split or stock combination; and

OS_1 = the number of shares of Common Stock outstanding immediately after giving effect to such dividend, distribution, stock split or stock combination.

For the avoidance of doubt, an adjustment pursuant to this **Section 5.05(A)(i)** will become effective as set forth the definition of CR_1 in this **Section 5.05(A)(i)**. If any dividend, distribution, stock split or stock combination of the type described in this **Section 5.05(A)(i)** is declared or announced, but not so paid or made, then the Conversion Rate will be readjusted, effective as of the date the Board of Directors determines not to pay such dividend or distribution or to effect such stock split or stock combination, to the Conversion Rate that would then be in effect had such dividend, distribution, stock split or stock combination not been declared or announced.

(ii) *Rights, Options and Warrants*. If the Company distributes, to all or substantially all holders of Common Stock, rights, options or warrants (other than rights issued or otherwise distributed pursuant to a stockholder rights plan, as to which **Sections 5.05(A)(iii)(1)** and **5.05(F)** will apply) entitling such holders, for a period of not more than sixty (60) calendar days after the record date of such distribution, to subscribe for or purchase shares of Common Stock at a price per share that is less than the average of the Last Reported Sale Prices per share of Common Stock for the ten (10) consecutive Trading Days ending on, and including, the Trading Day immediately before the date such

distribution is announced, then the Conversion Rate will be increased based on the following formula:

$$CR_1 = CR_0 \times \frac{OS + X}{OS + Y}$$

where:

CR_0 = the Conversion Rate in effect immediately before the Open of Business on the Ex-Dividend Date for such distribution;

CR_1 = the Conversion Rate in effect immediately after the Open of Business on such Ex-Dividend Date;

OS = the number of shares of Common Stock outstanding immediately before the Open of Business on such Ex-Dividend Date;

X = the total number of shares of Common Stock issuable pursuant to such rights, options or warrants; and

Y = a number of shares of Common Stock obtained by dividing (x) the aggregate price payable to exercise such rights, options or warrants by (y) the average of the Last Reported Sale Prices per share of Common Stock for the ten (10) consecutive Trading Days ending on, and including, the Trading Day immediately before the date such distribution is announced.

For the avoidance of doubt, an adjustment pursuant to this **Section 5.05(A)(ii)** will become effective set forth in the definition of CR_1 in this **Section 5.05(A)(ii)**. To the extent such rights, options or warrants are not so distributed, the Conversion Rate will be readjusted to the Conversion Rate that would then be in effect had the increase to the Conversion Rate for such distribution been made on the basis of only the rights, options or warrants, if any, actually distributed. In addition, to the extent that shares of Common Stock are not delivered after the expiration of such rights, options or warrants (including as a result of such rights, options or warrants not being exercised), the Conversion Rate will be readjusted to the Conversion Rate that would then be in effect had the increase to the Conversion Rate for such distribution been made on the basis of delivery of only the number of shares of Common Stock actually delivered upon exercise of such rights, option or warrants.

For purposes of this **Section 5.05(A)(ii)**, in determining whether any rights, options or warrants entitle holders of Common Stock to subscribe for or purchase shares of Common Stock at a price per share that is less than the average of the Last Reported Sale Prices per share of Common Stock for the ten (10) consecutive Trading Days ending on, and including, the Trading Day immediately before the date the distribution of such rights, options or warrants is announced, and in determining the aggregate price payable to exercise such rights, options or warrants, there will be taken into account any consideration the Company receives for such rights, options or warrants and any amount payable on

exercise thereof, with the value of such consideration, if not cash, to be determined by the Board of Directors.

(iii) *Spin-Offs and Other Distributed Property*.

(1) *Distributions Other than Spin-Offs*. If the Company distributes shares of its Capital Stock, evidence of its indebtedness or other assets or property of the Company, or rights, options or warrants to acquire Capital Stock of the Company or other securities, to all or substantially all holders of the Common Stock, excluding:

(u) dividends, distributions, rights, options or warrants for which an adjustment to the Conversion Rate is required (or would be required without regard to **Section 5.05(C)**) pursuant to **Section 5.05(A)(i)** or **5.05(A)(ii)**;

(v) dividends or distributions paid exclusively in cash for which an adjustment to the Conversion Rate is required (or would be required without regard to **Section 5.05(C)**) pursuant to **Section 5.05(A)(iv)**;

(w) rights issued or otherwise distributed pursuant to a stockholder rights plan, except to the extent provided in **Section 5.05(F)**;

(x) Spin-Offs for which an adjustment to the Conversion Rate is required (or would be required without regard to **Section 5.05(C)**) pursuant to **Section 5.05(A)(iii)(2)**;

(y) a distribution solely pursuant to a tender offer or exchange offer for shares of Common Stock, as to which **Section 5.05(A)(v)** will apply; and

(z) a distribution solely pursuant to a Common Stock Change Event, as to which **Section 5.09** will apply,

then the Conversion Rate will be increased based on the following formula:

$$CR_1 = CR_0 \times \frac{SP}{SP - FMV}$$

where:

CR_0 = the Conversion Rate in effect immediately before the Open of Business on the Ex-Dividend Date for such distribution;

CR_1 = the Conversion Rate in effect immediately after the Open of Business on such Ex-Dividend Date;

SP = the average of the Last Reported Sale Prices per share of Common Stock for the ten (10) consecutive Trading Days ending on, and including, the Trading Day immediately before such Ex-Dividend Date; and

FMV = the fair market value (as determined by the Board of Directors), as of such Ex-Dividend Date, of the shares of Capital Stock, evidence of indebtedness, assets or property of the Company, or rights, options or warrants to acquire Capital Stock or other securities, distributed per share of Common Stock pursuant to such distribution;

provided, *however*, that if *FMV* is equal to or greater than *SP*, then, in lieu of the foregoing adjustment to the Conversion Rate, each Holder will receive, for each $1,000 principal amount of Notes held by such Holder on the record date for such distribution, at the same time and on the same terms as holders of Common Stock, the amount and kind of shares of Capital Stock, evidence of indebtedness, assets or property of the Company, or rights, options or warrants to acquire Capital Stock or other securities, that such Holder would have received if such Holder had owned, on such record date, a number of shares of Common Stock equal to the Conversion Rate in effect on such record date.

For the avoidance of doubt, an adjustment pursuant to this **Section 5.05(A)(iii)(1)** will become effective as set forth in the definition of CR_1 in this **Section 5.05(A)(iii)(1)**. To the extent such distribution is not so paid or made, the Conversion Rate will be readjusted to the Conversion Rate that would then be in effect had the adjustment been made on the basis of only the distribution, if any, actually made or paid.

(2) *Spin-Offs*. If the Company distributes or dividends shares of Capital Stock of any class or series, or similar equity interests, of or relating to an Affiliate, a Subsidiary or other business unit of the Company to all or substantially all holders of the Common Stock (other than solely pursuant to (x) a Common Stock Change Event, as to which **Section 5.09** will apply; or (y) a tender offer or exchange offer for shares of Common Stock, as to which **Section 5.05(A)(v)** will apply), and such Capital Stock or equity interests are listed or quoted (or will be listed or quoted upon the consummation of the transaction) on a U.S. national securities exchange (a "**Spin-Off**"), then the Conversion Rate will be increased based on the following formula:

$$CR_1 = CR_0 \cdot \frac{FMV + SP}{SP}$$

where:

CR_0 = the Conversion Rate in effect immediately before the Close of Business on the last Trading Day of the Spin-Off Valuation Period for such Spin-Off;

CR_1 = the Conversion Rate in effect immediately after the Close of Business on the last Trading Day of the Spin-Off Valuation Period;

FMV = the product of (x) the average of the Last Reported Sale Prices per share or unit of the Capital Stock or equity interests distributed in such Spin-Off over the ten (10) consecutive Trading Day period (the "**Spin-Off Valuation Period**") beginning on, and including, the Ex-Dividend Date for such Spin-Off (such average to be determined as if references to Common Stock in the definitions of Last Reported Sale Price, Trading Day and Market Disruption Event were instead references to such Capital Stock or equity interests); and (y) the number of shares or units of such Capital Stock or equity interests distributed per share of Common Stock in such Spin-Off; and

SP = the average of the Last Reported Sale Prices per share of Common Stock for each Trading Day in the Spin-Off Valuation Period.

Notwithstanding anything to the contrary in this **Section 5.05(A)(iii)(2)**, if the Conversion Date for a Note occurs during the Spin-Off Valuation Period for such Spin-Off, then, solely for purposes of determining the Conversion Consideration for such conversion, such Spin-Off Valuation Period will be deemed to consist of the Trading Days occurring in the period from, and including, the Ex-Dividend Date for such Spin-Off to, and including, such Conversion Date.

For the avoidance of doubt, an adjustment pursuant to this **Section 5.05(A)(iii)(2)** will become effective as set forth in the definition of CR_1 in this **Section 5.05(A)(iii)(2)**. To the extent any dividend or distribution of the type set forth in this **Section 5.05(A)(iii)(2)** is declared but not made or paid, the Conversion Rate will be readjusted to the Conversion Rate that would then be in effect had the adjustment been made on the basis of only the dividend or distribution, if any, actually made or paid.

(iv) *Cash Dividends or Distributions*. If any cash dividend or distribution is made to all or substantially all holders of Common Stock, then the Conversion Rate will be increased based on the following formula:

$$CR_1 = CR_0 \times \frac{SP}{SP - D}$$

where:

CR_0 = the Conversion Rate in effect immediately before the Open of Business on the Ex-Dividend Date for such dividend or distribution;

CR_1 = the Conversion Rate in effect immediately after the Open of Business on such Ex-Dividend Date;

SP = the Last Reported Sale Price per share of Common Stock on the Trading Day immediately before such Ex-Dividend Date; and

D = the cash amount distributed per share of Common Stock in such dividend or distribution;

provided, *however*, that if *D* is equal to or greater than *SP*, then, in lieu of the foregoing adjustment to the Conversion Rate, each Holder will receive, for each $1,000 principal amount of Notes held by such Holder on the record date for such dividend or distribution, at the same time and on the same terms as holders of Common Stock, the amount of cash that such Holder would have received if such Holder had owned, on such record date, a number of shares of Common Stock equal to the Conversion Rate in effect on such record date.

For the avoidance of doubt, an adjustment pursuant to this **Section 5.05(A)(iv)** will become effective as set forth in the definition of CR_1 in this **Section 5.05(A)(iv)**. To the extent such dividend or distribution is declared but not made or paid, the Conversion Rate will be readjusted to the Conversion Rate that would then be in effect had the adjustment been made on the basis of only the dividend or distribution, if any, actually made or paid.

(v) *Tender Offers or Exchange Offers*. If the Company or any of its Subsidiaries makes a payment in respect of a tender offer or exchange offer for shares of Common Stock, and the value (determined as of the Expiration Time by the Board of Directors) of the cash and other consideration paid per share of Common Stock in such tender or exchange offer exceeds the Last Reported Sale Price per share of Common Stock on the Trading Day immediately after the last date (the "**Expiration Date**") on which tenders or exchanges may be made pursuant to such tender or exchange offer (as it may be amended), then the Conversion Rate will be increased based on the following formula:

$$CR_1 = CR_0 \times \frac{AC + (SP \times OS_1)}{SP \times OS_0}$$

where:

CR_0 = the Conversion Rate in effect immediately before the Close of Business on the last Trading Day of the Tender/Exchange Offer Valuation Period for such tender or exchange offer;

CR_1 = the Conversion Rate in effect immediately after the Close of Business on the last Trading Day of the Tender/Exchange Offer Valuation Period;

AC = the aggregate value (determined as of the time (the "**Expiration Time**") such tender or exchange offer expires by the Board of Directors) of all cash and other consideration paid for shares of Common Stock purchased or exchanged in such tender or exchange offer;

OS_0 = the number of shares of Common Stock outstanding immediately before the Expiration Time (including all shares of Common Stock accepted for purchase or exchange in such tender or exchange offer);

OS_1 = the number of shares of Common Stock outstanding immediately after the Expiration Time (excluding all shares of Common Stock accepted for purchase or exchange in such tender or exchange offer); and

SP = the average of the Last Reported Sale Prices per share of Common Stock over the ten (10) consecutive Trading Day period (the "**Tender/Exchange Offer Valuation Period**") beginning on, and including, the Trading Day immediately after the Expiration Date;

provided, *however*, that the Conversion Rate will in no event be adjusted down pursuant to this **Section 5.05(A)(v)**, except to the extent provided in the immediately following paragraph. For the avoidance of doubt, an adjustment pursuant to this **Section 5.05(A)(v)** will become effective as set forth in the definition of CR_1 in this **Section 5.05(A)(v)**. Notwithstanding anything to the contrary in this **Section 5.05(A)(v)**, if the Conversion Date for a Note occurs during the Tender/Exchange Offer Valuation Period for such tender or exchange offer, then, solely for purposes of determining the Conversion Consideration for such conversion, such Tender/Exchange Offer Valuation Period will be deemed to consist of the Trading Days occurring in the period from, and including, the Trading Day immediately after the Expiration Date to, and including, such Conversion Date.

To the extent such tender or exchange offer is announced but not consummated (including as a result of the Company being precluded from consummating such tender or exchange offer under applicable law), or any purchases or exchanges of shares of Common Stock in such tender or exchange offer are rescinded, the Conversion Rate will be readjusted to the Conversion Rate that would then be in effect had the adjustment been made on the basis of only the purchases or exchanges of shares of Common Stock, if any, actually made, and not rescinded, in such tender or exchange offer.

(vi) *Adjustments to Applicable Share Price*. The Applicable Share Price for purposes of calculating any amounts payable pursuant to the Applicable Premium or Strategic Make-Whole shall be appropriately adjusted in respect of any of the events referred to in this Article V to the extent necessary to effect and protect the intended economic benefits thereof.

(B)*No Adjustments in Certain Cases*.

(i) *Where Holders Participate in the Transaction or Event Without Conversion*. Notwithstanding anything to the contrary in **Section 5.05(A)**, the Company will not be obligated to adjust the Conversion Rate on account of a transaction or other event otherwise requiring an adjustment pursuant to **Section 5.05(A)** (other than a stock split or combination of the type set forth in **Section 5.05(A)(i)** or a tender or exchange offer of the type set forth in **Section 5.05(A)(v)**) if each Holder participates, at the same time and on the same terms as holders of Common Stock, and solely by virtue of being a Holder of Notes, in such transaction or event without having to convert such Holder's Notes and as if such Holder held a number of shares of Common Stock equal to the product of (i) the Conversion Rate in effect on the related record date; and (ii) the aggregate principal amount (expressed in thousands) of Notes held by such Holder on such date.

(ii) *Certain Events*. The Company will not be required to adjust the Conversion Rate except as provided in **Section 5.05**. Without limiting the foregoing, the Company will not be obligated to adjust the Conversion Rate on account of:

(1) except as otherwise provided in **Section 5.05**, the sale of shares of Common Stock for a purchase price that is less than the market price per share of Common Stock or less than the Conversion Price;

(2) the issuance of any shares of Common Stock pursuant to any present or future plan providing for the reinvestment of dividends or interest payable on the Company's securities and the investment of additional optional amounts in shares of Common Stock under any such plan;

(3) the issuance of any shares of Common Stock or options or rights to purchase shares of Common Stock pursuant to any present or future employee, director or consultant benefit plan or program of, or assumed by, the Company or any of its Subsidiaries;

(4) the issuance of any shares of Common Stock pursuant to any option, warrant, right or convertible or exchangeable security of the Company outstanding as of the Issue Date;

(5) for a third party tender offer by any party other than a tender offer by the Company or one or more of its Subsidiaries described in **Section 5.05(A)(v)**;

(6) on account of share repurchases, including structured or derivative transactions, or transactions pursuant to a share repurchase program approved by the Board of Directors, or otherwise, in each case that are not tender offers of the type described in **Section 5.05(A)(v)**;

(7) solely a change in the par value of the Common Stock; or

(8) accrued and unpaid interest on the Notes.

(C)*Adjustment Deferral*. If an adjustment to the Conversion Rate otherwise required by this **Article 5** would result in a change of less than one percent (1%) to the Conversion Rate, then, notwithstanding anything to the contrary in this **Article 5**, the Company may, at its election, defer such adjustment, except that all such deferred adjustments must be given effect immediately upon the earliest of the following: (i) when all such deferred adjustments would result in a change of at least one percent (1%) to the Conversion Rate; (ii) the Conversion Date of any Note; (iii) the date a Fundamental Change occurs; (iv) the date the Company calls any Notes for Redemption; and (v) December 19, 2028.

(D)*Adjustments Not Yet Effective*. Notwithstanding anything to the contrary in this Indenture or the Notes, if:

(i) a Note is to be converted;

(ii) the record date, effective date or Expiration Time for any event that requires an adjustment to the Conversion Rate pursuant to **Section 5.05(A)** has occurred on or before the Conversion Date for such conversion, but an adjustment to the Conversion Rate for such event has not yet become effective as of such Conversion Date;

(iii) the Conversion Consideration due upon such conversion includes any whole shares of Common Stock; and

(iv) such shares are not entitled to participate in such event (because they were not held on the related record date or otherwise),

then, solely for purposes of such conversion, the Company will, without duplication, give effect to such adjustment on such Conversion Date. In such case, if the date on which the Company is otherwise required to deliver the consideration due upon such conversion is before the first date on which the amount of such adjustment can be determined, then the Company will delay the settlement of such conversion until the second (2nd) Business Day after such first date, and such delay will not be a Default under this Indenture or the Notes.

(E)*Conversion Rate Adjustments where Converting Holders Participate in the Relevant Transaction or Event*. Notwithstanding anything to the contrary in this Indenture or the Notes, if:

(i) a Conversion Rate adjustment for any dividend or distribution becomes effective on any Ex-Dividend Date pursuant to **Section 5.05(A)**;

(ii) a Note is to be converted;

(iii) the Conversion Date for such conversion occurs on or after such Ex-Dividend Date and on or before the related record date;

(iv) the Conversion Consideration due upon such conversion includes any whole shares of Common Stock based on a Conversion Rate that is adjusted for such dividend or distribution; and

(v) such shares would be entitled to participate in such dividend or distribution (including pursuant to **Section 5.02(C)**),

then (x) such Conversion Rate adjustment will not be given effect for such conversion; (y) the shares of Common Stock issuable upon such conversion based on such unadjusted Conversion Rate will not be entitled to participate in such dividend or distribution; and (z) there will be added, to the Conversion Consideration otherwise due upon such conversion, the same kind and amount of consideration that would have been delivered in such dividend or distribution with respect to such shares of Common Stock had such shares been entitled to participate in such dividend or distribution.

(F)*Stockholder Rights Plans*. If any shares of Common Stock are to be issued upon conversion of any Note and, at the time of such conversion, the Company has in effect any stockholder rights plan, then the Holder of such Note will be entitled to receive, in addition to, and concurrently with the delivery of, the Conversion Consideration otherwise payable under this Indenture upon such conversion, the rights set forth in such stockholder rights plan, unless, prior to the applicable Conversion Date, such rights have separated from the Common Stock, in which case, and only in such case, the Conversion Rate will be adjusted pursuant to **Section 5.05(A)(iii)(1)** on account of such separation as if, at the time of such separation, the Company had made a distribution of the type referred to in such Section to all holders of the Common Stock, subject to potential readjustment in accordance with the last paragraph of **Section 5.05(A)(iii)(1)**. For the avoidance of doubt, in all other cases, the issuance of rights pursuant to a stockholder rights plan will not result in an adjustment to the Conversion Rate pursuant **Section 5.05(A)(iii)(1)**.

(G)*Limitation on Effecting Transactions Resulting in Certain Adjustments*. The Company will not engage in or be a party to any transaction or event that would require the Conversion Rate to be adjusted pursuant to **Section 5.05(A)** to an amount that would result in the Conversion Price per share of Common Stock being less than the par value per share of Common Stock.

(H)*Equitable Adjustments to Prices*. Whenever any provision of this Indenture requires the Company to calculate the average of the Last Reported Sale Prices, or any function thereof, over a period of multiple days (including to calculate an adjustment to the Conversion Rate), the Company will make proportionate adjustments, if any, to such calculations to account for any adjustment to the Conversion Rate pursuant to **Section 5.05(A)(i)** that becomes effective, or any event requiring such an adjustment to the Conversion Rate where the Ex-Dividend Date or effective date, as applicable, of such event occurs, at any time during such period.

(I) *Calculation of Number of Outstanding Shares of Common Stock*. For purposes of **Section 5.05(A)**, the number of shares of Common Stock outstanding at any time will (i) include shares issuable in respect of scrip certificates issued in lieu of fractions of shares of Common Stock; and (ii) exclude shares of Common Stock held in the Company's treasury (unless the

Company pays any dividend or makes any distribution on shares of Common Stock held in its treasury).

(J) *Calculations*. All calculations with respect to the Conversion Rate and adjustments thereto will be made to the nearest 1/10,000th of a share of Common Stock (with 5/100,000ths rounded upward).

(K)*Notice of Conversion Rate Adjustments*. Upon the effectiveness of any adjustment to the Conversion Rate pursuant to **Section 5.05(A)**, the Company will promptly send notice to the Holders, the Trustee and the Conversion Agent containing (i) a brief description of the transaction or other event on account of which such adjustment was made; (ii) the Conversion Rate in effect immediately after such adjustment; and (iii) the effective time of such adjustment.

SECTION 5.06.VOLUNTARY ADJUSTMENTS.

(A)*Generally*. To the extent permitted by law and applicable stock exchange rules, the Company, from time to time, may (but is not required to) increase the Conversion Rate by any amount if (i) the Board of Directors determines that such increase is either (x) in the best interest of the Company; or (y) advisable to avoid or diminish any income tax imposed on holders of Common Stock or rights to purchase Common Stock as a result of any dividend or distribution of shares (or rights to acquire shares) of Common Stock or any similar event; (ii) such increase is in effect for a period of at least twenty (20) Business Days; and (iii) such increase is irrevocable during such period.

(B)*Notice of Voluntary Increases*. If the Board of Directors determines to increase the Conversion Rate pursuant to **Section 5.06(A)**, then, no later than the first Business Day of the related twenty (20) Business Day period referred to in **Section 5.06(A)**, the Company will send notice to each Holder, the Trustee and the Conversion Agent of such increase, the amount thereof and the period during which such increase will be in effect.

SECTION 5.07.RESERVED.

SECTION 5.08.EXCHANGE IN LIEU OF CONVERSION.

Notwithstanding anything to the contrary in this **Article 5**, and subject to the terms of this **Section 5.08**, if a Note is submitted for conversion, the Company may elect to arrange to have such Note exchanged in lieu of conversion by a financial institution designated by the Company. To make such election, the Company must send notice of such election to the Holder of such Note, the Trustee and the Conversion Agent before the Close of Business on the Business Day immediately following the Conversion Date for such Note. If the Company has made such election, then:

(A)no later than the Business Day immediately following such Conversion Date, the Company must deliver (or cause the Conversion Agent to deliver) such Note, together with delivery instructions for the Conversion Consideration due upon such conversion (including wire instructions, if applicable), to a financial institution designated by the Company that has agreed to deliver such Conversion Consideration in the manner and at the time the Company would have had to deliver the same pursuant to this **Article 5**;

(B)if such Note is a Global Note, then (i) such designated institution will send written confirmation to the Company, the Conversion Agent and the holder of the beneficial interest in the Note promptly after wiring the cash Conversion Consideration, if any, and delivering any other Conversion Consideration, due upon such conversion to holder of the beneficial interest in such Note; and (ii) the Conversion Agent will as soon as reasonably practicable thereafter contact the custodian with the Depositary of such holder of the beneficial interest in such Note to confirm receipt of the same; and

(C)such Note will not cease to be outstanding by reason of such exchange in lieu of conversion;

provided, *however*, that if such financial institution does not accept such Note or fails to timely deliver such Conversion Consideration, then the Company will be responsible for delivering such Conversion Consideration in the manner and at the time provided in this **Article 5** as if the Company had not elected to make an exchange in lieu of conversion.

SECTION 5.09.EFFECT OF COMMON STOCK CHANGE EVENT.

(A)*Generally*. If there occurs any:

(i) recapitalization, reclassification or change of the Common Stock (other than (x) changes solely resulting from a subdivision or combination of the Common Stock, (y) a change only in par value or from par value to no par value or no par value to par value and (z) stock splits and stock combinations that do not involve the issuance of any other series or class of securities);

(ii) consolidation, merger, combination or binding or statutory share exchange involving the Company;

(iii) sale, lease or other transfer of all or substantially all of the assets of the Company and its Subsidiaries, taken as a whole, to any Person; or

(iv) other similar event,

and, as a result of which, the Common Stock is converted into, or is exchanged for, or represents solely the right to receive, other securities, cash or other property, or any combination of the foregoing (such an event, a "**Common Stock Change Event**," and such other securities, cash or property, the "**Reference Property**," and the amount and kind of Reference Property that a holder of one (1) share of Common Stock would be entitled to receive on account of such Common Stock Change Event (without giving effect to any arrangement not to issue or deliver a fractional portion of any security or other property), a "**Reference Property Unit**"), then, notwithstanding anything to the contrary in this Indenture or the Notes,

(1) from and after the effective time of such Common Stock Change Event, (I) the Conversion Consideration due upon conversion of any Note will be determined in the same manner as if each reference to any number of shares of Common Stock in this **Article 5** (or in any related definitions) were instead a reference to the same number of Reference Property Units; (II) for purposes of **Section 4.03**, each reference to any number of shares

of Common Stock in such Section (or in any related definitions) will instead be deemed to be a reference to the same number of Reference Property Units; and (III) for purposes of the definition of "Fundamental Change" references to "Common Stock" and the Company's "common equity" will be deemed to refer to the common equity (including depositary receipts representing common equity), if any, forming part of such Reference Property; and

(2) for these purposes, the Last Reported Sale Price of any Reference Property Unit or portion thereof that does not consist of a class of securities will be the fair value of such Reference Property Unit or portion thereof, as applicable, determined in good faith by the Company (or, in the case of cash denominated in U.S. dollars, the face amount thereof).

If the Reference Property consists of more than a single type of consideration to be determined based in part upon any form of stockholder election, then the composition of the Reference Property Unit will be deemed to be the weighted average of the types and amounts of consideration actually received, per share of Common Stock, by the holders of Common Stock. The Company will notify Holders of such weighted average as soon as practicable after such determination is made.

At or before the effective time of such Common Stock Change Event, the Company and the resulting, surviving or transferee Person (if not the Company) of such Common Stock Change Event (the "**Successor Person**") will execute and deliver to the Trustee a supplemental indenture pursuant to **Section 8.01(F)**, which supplemental indenture will (x) provide for subsequent conversions of Notes in the manner set forth in this **Section 5.09**; (y) provide for subsequent adjustments to the Conversion Rate pursuant to **Section 5.05(A)** in a manner consistent with this **Section 5.09**; and (z) contain such other provisions, if any, that the Company reasonably determines are appropriate to preserve the economic interests of the Holders and to give effect to the provisions of this **Section 5.09(A)**. If the Reference Property includes shares of stock or other securities or assets (other than cash) of a Person other than the Successor Person, then such other Person will also execute such supplemental indenture and such supplemental indenture will contain such additional provisions, if any, that the Company reasonably determines are appropriate to preserve the economic interests of the Holders. For the avoidance of doubt, the Trustee shall not be liable for or otherwise responsible for the amendments effected pursuant to such supplemental indenture.

(B)*Notice of Common Stock Change Events*. The Company will provide notice of each Common Stock Change Event to Holders, the Trustee and the Conversion Agent no later than the effective date of such Common Stock Change Event.

(C)*Compliance Covenant*. The Company will not become a party to any Common Stock Change Event unless its terms are consistent with this **Section 5.09**.

SECTION 5.10.TRUSTEE AND THE NOTE AGENTS

(A) Notwithstanding anything contained herein to the contrary, upon delivery of the Conversion Consideration to a Holder, in connection therewith, the Company will provide the

Trustee and Registrar with (y) written confirmation of (I) such delivery, and (II) the amount of the principal of the Notes of such Holder and the accrued and unpaid interest thereon and any other amounts that are deemed to cease to be outstanding as a result of the delivery of the Conversion Consideration to the Holder in connection with such conversion, and (z) an irrevocable instruction to reflect in the Register the payment of such amounts that are deemed to cease to be outstanding as a result of the delivery of the Conversion Consideration to the Holder. The Company shall provide at least two Business Days prior written notification to the Trustee and the Paying Agent of any payments to be made in cash in connection with any conversion.

(B) The Company and its agents shall be responsible for making all calculations include, but are not limited to, determination of the Last Reported Sale Price, the Conversion Price and any adjustments to thereto, the amount of Conversion Consideration deliverable in respect of any conversion and accrued interest payable on the Notes. The Company shall make all these calculations in good faith and, absent manifest error the Company's calculations shall be final and binding on the Holders. The Company shall provide a schedule of its calculations to each of the Trustee and the Conversion Agent, and each of the Trustee and Conversion Agent is entitled to rely conclusively upon the accuracy of the Company's calculation without independent verification. The Trustee may forward Company's calculations to any Holders upon the request of that Holders at the sole cost and expense of the Company.

(C) Notwithstanding anything contained herein to the contrary, under no circumstances shall the Trustee, the Collateral Agent or any Note Agent be responsible for determining the Conversion Price, any Conversion Rate, Applicable Premium or Strategic Make-Whole or any aspect of the Conversion Consideration, any Reference Property or any Reference Property Unit, or, in each case, any conditions or requirements related to their calculation or re-calculation or otherwise. Neither the Trustee, the Collateral Agent nor any Note Agent shall be responsible for ascertaining whether any Holder or the Company is entitled to exercise any right or take any other action with respect to the conversion of the Notes or otherwise pursuant to this Article V or whether any Holder or the Company has complied with the terms of this Article V in connection therewith (including, without limitation, whether any Conversion Consideration or any other cash payments have been delivered or paid in accordance with the terms herein). Neither the Trustee, the Collateral Agent nor any Note Agent shall be responsible for the delivery of any Conversion Consideration (including any Common Stock of the Company), Reference Property or Reference Property Units; it being understood that the Company shall be solely responsible for ensuring the delivery thereof and for complying with any Depositary Procedures in connection therewith.

(D) Neither the Trustee, the Collateral Agent nor any Note Agent shall have any obligation to make any calculation or to determine whether the securities may be surrendered for conversion, or to notify the Company, the Depositary or any Holders if the Notes have become convertible.

(E) Neither the Trustee, the Collateral Agent nor any Note Agent shall have any obligation to (1) monitor the stock price, make any calculation or determine whether the Notes may be surrendered for conversion or (2) notify the Company, the Depositary, DTC or any holders of the securities, if the securities have become convertible.

Article 6.SUCCESSORS

Section 6.01.When the Company May Merge, Etc.

(A)*Generally*. The Company will not consolidate with or merge with or into, or (directly, or indirectly through one or more of its Subsidiaries) sell, lease or otherwise transfer, in one transaction or a series of transactions, all or substantially all of the assets of the Company and its Subsidiaries, taken as a whole, to another Person (a "**Business Combination Event**"), unless:

(i) the resulting, surviving or transferee Person either (x) is the Company or (y) if not the Company, is a corporation (the "**Successor Corporation**") duly organized and existing under the laws of the United States of America, any State thereof or the District of Columbia that expressly assumes (by executing and delivering to the Trustee, at or before the effective time of such Business Combination Event, a supplemental indenture pursuant to **Section 8.01(E)**) all of the Company's obligations under this Indenture and the Notes; and

(ii) immediately after giving effect to such Business Combination Event, no Default or Event of Default will have occurred and be continuing.

(B)*Delivery of Officer's Certificate and Opinion of Counsel to the Trustee*. Before the effective time of any Business Combination Event, the Company will deliver to the Trustee an Officer's Certificate and Opinion of Counsel, each stating that (i) such Business Combination Event (and, if applicable, the related supplemental indenture) comply with **Section 6.01(A)**; and (ii) all conditions precedent to such Business Combination Event provided in this Indenture have been satisfied.

Section 6.02.Successor Corporation Substituted.

At the effective time of any Business Combination Event that complies with **Section 6.01**, the Successor Corporation (if not the Company) will succeed to, and may exercise every right and power of, the Company under the Notes Documents with the same effect as if such Successor Corporation had been named as the Company in the Notes Documents, and, except in the case of a lease, the predecessor Company will be discharged from its obligations under the Notes Documents.

Article 7.DEFAULTS AND REMEDIES

Section 7.01.Events of Default.

(A)*Definition of Events of Default*. "**Event of Default**" means the occurrence of any of the following:

(i) a default in the payment when due (whether at maturity, upon Redemption or Repurchase Upon Fundamental Change or otherwise) of the principal of, or the Redemption Price or Fundamental Change Repurchase Price for, any Note;

(ii) a default for thirty (30) days in the payment when due of interest on any Note;

(iii) the Company's failure to deliver, when required by this Indenture, a Fundamental Change Notice, if such failure is not cured within three (3) Business Days of its occurrence;

(iv) a default in the Company's obligation to convert a Note in accordance with **Article 5** upon the exercise of the conversion right with respect thereto, if such default is not cured within three (3) Business Days after its occurrence;

(v) a default in the Company's obligations under **Article 6**;

(vi) a default in any of the Company's obligations or agreements under this Indenture or the Notes (other than a default set forth in **clause (i)**, **(ii)**, **(iii)**, **(iv)** or **(v)** of this **Section 7.01(A)**) where such default is not cured or waived within sixty (60) days after written notice to the Company by the Trustee, or to the Company and the Trustee by Holders of at least twenty five percent (25%) of the aggregate principal amount of Notes then outstanding, which notice must specify such default, demand that it be remedied and state that such notice is a "Notice of Default";

(vii) a default by the Company or any of the Company's Subsidiaries with respect to any one or more mortgages, agreements or other instruments under which there is outstanding, or by which there is secured or evidenced, any indebtedness for money borrowed of at least two hundred and fifty thousand dollars ($250,000) (or its foreign currency equivalent) in the aggregate of the Company or any of the Company's Subsidiaries, whether such indebtedness exists as of the Issue Date or is thereafter created, where such default:

(1) constitutes a failure to pay the principal of, or premium or interest on, any of such indebtedness when due and payable at its stated maturity, upon required repurchase, upon declaration of acceleration or otherwise, in each case after the expiration of any applicable grace period; or

(2) results in such indebtedness becoming or being declared due and payable before its stated maturity;

(viii) one or more final and non-appealable judgments being rendered against the Company or any of the Company's Subsidiaries for the payment of at least two hundred and fifty thousand dollars ($250,000) (or its foreign currency equivalent) in the aggregate (excluding any amounts covered by insurance or bond), where such judgment is not discharged, stayed, vacated or otherwise satisfied within sixty (60) days after (i) the date on which the right to appeal the same has expired, if no such appeal has commenced; or (ii) the date on which all rights to appeal have been extinguished;

(ix) the Company or any of the Guarantors or the Company's Significant Subsidiaries, pursuant to or within the meaning of any Bankruptcy Law, either:

(1) commences a voluntary case or proceeding;

(2) consents to the entry of an order for relief against it in an involuntary case or proceeding;

(3) consents to the appointment of a custodian of it or for any substantial part of its property;

(4) makes a general assignment for the benefit of its creditors;

(5) takes any comparable action under any foreign Bankruptcy Law; or

(6) generally is not paying its debts as they become due;

(x) a court of competent jurisdiction enters an order or decree under any Bankruptcy Law that either:

(1) is for relief against the Company, any Guarantor or any of the Company's Significant Subsidiaries in an involuntary case or proceeding;

(2) appoints a custodian of the Company, any Guarantor or any of the Company's Significant Subsidiaries, or for any substantial part of the property of the Company, any Guarantor or any of the Company's Significant Subsidiaries;

(3) orders the winding up or liquidation of the Company, any Guarantor or any of the Company's Significant Subsidiaries; or

(4) grants any similar relief under any foreign Bankruptcy Law,

and, in each case under this **Section 7.01(A)(x)**, such order or decree remains unstayed and in effect for at least sixty (60) days;

(xi) any Guarantee ceases to be in full force and effect or any Guarantor denies or disaffirms it obligations under the Guarantee (in each case, except (i) in connection with a transaction expressly permitted under this Indenture or the Collateral Documents, in each case solely to the extent the release of such Guarantee is permitted under this Indenture or the Collateral Documents or (ii) as a result of the satisfaction and discharge of this Indenture in accordance with **Article 9**);

(xii) any material provision of any Notes Document shall for any reason cease to be valid and binding on or enforceable against the Company or any of its Subsidiaries, or the Company or any of its Subsidiaries shall so state in writing or bring an action to limit its obligations or liabilities thereunder except (i) as permitted by the Notes Documents, (ii) resulting from the satisfaction of the obligations (other than contingent obligations that

have yet to accrue) under this Indenture, or (iii) resulting from the application of applicable law; or

(xiii) any security interest or Liens purported to be created by any Collateral Document on any material portion of the Collateral shall cease to be in full force and effect, or shall be asserted by or on behalf of the Company or any of the Guarantors in writing not to be a valid and perfected security interest in or Lien on the Collateral covered thereby (in each case, except (i) the failure of the Collateral Agent to maintain possession of possessory Collateral received by it, which failure is not a direct result of any act, omission, advice or direction of the Company, (ii) in connection with a transaction expressly permitted under this Indenture or the Collateral Documents, in each case solely to the extent such termination or release is permitted under this Indenture or the Collateral Documents or (iii) or resulting from acts or omissions of the Trustee or Collateral Agent or (iv) as a result of the satisfaction and discharge of this Indenture in accordance with **Article 9**).

(B)*Cause Irrelevant*. Each of the events set forth in **Section 7.01(A)** will constitute an Event of Default regardless of the cause thereof or whether voluntary or involuntary or effected by operation of law or pursuant to any judgment, decree or order of any court or any order, rule or regulation of any administrative or governmental body.

SECTION 7.02.ACCELERATION.

(A)*Automatic Acceleration in Certain Circumstances*. If an Event of Default set forth in **Section 7.01(A)(ix)** or **7.01(A)(x)** occurs with respect to the Company or any Guarantor (and not solely with respect to a Significant Subsidiary of the Company), then the principal amount of, and all accrued and unpaid interest, and any Applicable Premium that has become due, on, all of the Notes then outstanding will immediately become due and payable without any further action or notice by any Person.

(B)*Optional Acceleration*. Subject to **Section 7.03**, if an Event of Default (other than an Event of Default set forth in **Section 7.01(A)(ix)** or **7.01(A)(x)** with respect to the Company or any Guarantor and not solely with respect to a Significant Subsidiary of the Company) occurs and is continuing, then the Trustee (acting at the direction of the Required Holders), by notice to the Company, or Holders of at least twenty five percent (25%) of the aggregate principal amount of Notes then outstanding, by notice to the Company and the Trustee, may declare the principal amount of, and all accrued and unpaid interest, and any Applicable Premium that has become due, on, all of the Notes then outstanding to become due and payable immediately.

(C)*Rescission of Acceleration*. Notwithstanding anything to the contrary in this Indenture or the Notes, the Required Holders, by notice to the Company and the Trustee, may, on behalf of all Holders, rescind any acceleration of the Notes and its consequences if (i) such rescission would not conflict with any judgment or decree of a court of competent jurisdiction; and (ii) all existing Events of Default (except the non-payment of principal of, or interest or the Applicable Premium, on, the Notes that has become due solely because of such acceleration) have been cured or waived. No such rescission will affect any subsequent Default or impair any right consequent thereto.

SECTION 7.03.SOLE REMEDY FOR A FAILURE TO REPORT.

(A)*Generally*. Notwithstanding anything to the contrary in this Indenture or the Notes, the Company may elect that the sole remedy for any Event of Default (a "**Reporting Event of Default**") pursuant to **Section 7.01(A)(vi)** arising from the Company's failure to comply with **Section 3.02** will, for each of the first one hundred eighty (180) calendar days on which a Reporting Event of Default has occurred and is continuing, consist exclusively of the accrual of Special Interest on the Notes. If the Company has made such an election, then (i) the Notes will be subject to acceleration pursuant to **Section 7.02** on account of the relevant Reporting Event of Default from, and including, the one hundred eighty first (181st) calendar day on which a Reporting Event of Default has occurred and is continuing or if the Company fails to pay any accrued and unpaid Special Interest when due; and (ii) Special Interest will cease to accrue on any Notes from, and including, such one hundred eighty first (181st) calendar day (it being understood that interest on any defaulted Special Interest will nonetheless accrue pursuant to **Section 2.05(B)**).

(B)*Amount and Payment of Special Interest*. Any Special Interest that accrues on a Note pursuant to **Section 7.03(A)** will be payable on the same dates and in the same manner as the interest on such Note and will accrue at a rate per annum equal to one quarter of one percent (0.25%) of the principal amount thereof for the first ninety (90) days on which Special Interest accrues and, thereafter, at a rate per annum equal to one half of one percent (0.50%) of the principal amount thereof; *provided*, *however*, that in no event will Special Interest, together with any Additional Interest, accrue on any day on a Note at a combined rate per annum that exceeds one half of one percent (0.50%). For the avoidance of doubt, any Special Interest that accrues on a Note will be in addition to the interest that accrues on such Note and, subject to the proviso of the immediately preceding sentence, in addition to any Additional Interest that accrues on such Note.

(C)*Notice of Election*. To make the election set forth in **Section 7.03(A)**, the Company must send to the Holders, the Trustee and the Paying Agent, before the date on which each Reporting Event of Default first occurs, a notice that (i) briefly describes the report(s) that the Company failed to file with or furnish to the SEC; (ii) states that the Company is electing that the sole remedy for such Reporting Event of Default consist of the accrual of Special Interest; and (iii) briefly describes the periods during which and rate at which Special Interest will accrue and the circumstances under which the Notes will be subject to acceleration on account of such Reporting Event of Default.

(D)*Notice to Trustee and Paying Agent; Trustee's Disclaimer*. If Special Interest accrues on any Note, then, no later than five (5) Business Days before each date on which such Special Interest is to be paid, the Company will deliver an Officer's Certificate to the Trustee and the Paying Agent stating (i) that the Company is obligated to pay Special Interest on such Note on such date of payment; and (ii) the amount of such Special Interest that is payable on such date of payment. The Trustee will have no duty to determine whether any Special Interest is payable or the amount thereof.

(E)*No Effect on Other Events of Default*. No election pursuant to this **Section 7.03** with respect to a Reporting Event of Default will affect the rights of any Holder with respect to any other Event of Default, including with respect to any other Reporting Event of Default.

Section 7.04.Other Remedies.

(A)*Trustee and the Collateral Agent May Pursue All Remedies*. If an Event of Default occurs and is continuing, then the Trustee and the Collateral Agent may pursue any available remedy to collect the payment of any amounts due with respect to the Notes or to enforce the performance of any provision of this Indenture or the Notes.

(B)*Procedural Matters*. The Trustee and the Collateral Agent may maintain a proceeding even if it does not possess any of the Notes or does not produce any of them in such proceeding. A delay or omission by the Trustee, the Collateral Agent or any Holder in exercising any right or remedy following an Event of Default will not impair the right or remedy or constitute a waiver of, or acquiescence in, such Event of Default. All remedies will be cumulative to the extent permitted by law.

Section 7.05.Waiver of Past Defaults.

An Event of Default pursuant to **clause (i)**, **(ii)**, **(iv)** or **(vi)** of **Section 7.01(A)** (that, in the case of **clause (vi)** only, results from a Default under any covenant that cannot be amended without the consent of each affected Holder), and a Default that could lead to such an Event of Default, can be waived only with the consent of each affected Holder. Each other Default or Event of Default may be waived, on behalf of all Holders, by the Required Holders. If an Event of Default is so waived, then it will cease to exist. If a Default is so waived, then it will be deemed to be cured and any Event of Default arising therefrom will be deemed not to occur. However, no such waiver will extend to any subsequent or other Default or Event of Default or impair any right arising therefrom.

Section 7.06.Control by Required Holders.

The Required Holders may direct the time, method and place of conducting any proceeding for exercising any remedy available to the Trustee or the Collateral Agent or exercising any trust or power conferred on it. However, the Trustee or the Collateral Agent may refuse to follow any direction that conflicts with law, this Indenture or the Notes, or that, subject to **Section 10.01**, the Trustee or the Collateral Agent, as applicable, determines may be unduly prejudicial to the rights of other Holders or may involve the Trustee or the Collateral Agent in liability, unless the Trustee or the Collateral Agent, as applicable, is offered security and indemnity satisfactory to the Trustee or the Collateral Agent, as applicable, against any loss, liability or expense to the Trustee or the Collateral Agent that may result from following such direction.

Section 7.07.Limitation on Suits.

No Holder may pursue any remedy with respect to this Indenture or the Notes (except to enforce (x) its rights to receive the principal of, or the Redemption Price or Fundamental Change Repurchase Price for, or interest on, any Notes; or (y) the Company's obligations to convert any Notes pursuant to **Article 5**), unless:

(A)such Holder has previously delivered to the Trustee and the Collateral Agent notice that an Event of Default is continuing;

(B)Holders of at least twenty five percent (25%) in aggregate principal amount of the Notes then outstanding deliver a request to the Trustee and the Collateral Agent to pursue such remedy;

(C)such Holder or Holders offer and, if requested, provide to the Trustee or the Collateral Agent security and indemnity satisfactory to the Trustee and the Collateral Agent against any loss, liability or expense to the Trustee and the Collateral Agent that may result from following such request;

(D)the Trustee and the Collateral Agent do not comply with such request within sixty (60) calendar days after its receipt of such request and such offer of security or indemnity; and

(E)during such sixty (60) calendar day period, the Required Holders do not deliver to the Trustee or the Collateral Agent a direction that is inconsistent with such request.

A Holder of a Note may not use this Indenture to prejudice the rights of another Holder or to obtain a preference or priority over another Holder. Neither the Trustee nor the Collateral Agent will have any duty to determine whether any Holder's use of this Indenture complies with the preceding sentence.

Section 7.08.Absolute Right of Holders to Institute Suit for the Enforcement of the Right to Receive Payment and Conversion Consideration.

Notwithstanding anything to the contrary in this Indenture or the Notes (but without limiting **Section 8.01**), the right of each Holder of a Note to bring suit for the enforcement of any payment or delivery, as applicable, of the principal of, or the Redemption Price or Fundamental Change Repurchase Price for, or any interest on, or the Conversion Consideration due pursuant to **Article 5** upon conversion of, such Note on or after the respective due dates therefor provided in this Indenture and the Notes, will not be impaired or affected without the consent of such Holder.

Section 7.09.Collection Suit by Trustee.

The Trustee will have the right, upon the occurrence and continuance of an Event of Default pursuant to **clause (i)**, **(ii)** or **(iv)** of **Section 7.01(A)**, to recover judgment in its own name and as trustee of an express trust against the Company for the total unpaid or undelivered principal of, or Redemption Price or Fundamental Change Repurchase Price for, or interest on, or Conversion Consideration due pursuant to **Article 5** upon conversion of, the Notes, as applicable, and, to the extent lawful, any Default Interest on any Defaulted Amounts, and such further amounts sufficient to cover the costs and expenses of collection, including compensation provided for in **Section 10.06**.

Section 7.10.Trustee May File Proofs of Claim.

The Trustee has the right to (A) file such proofs of claim and other papers or documents as may be necessary or advisable in order to have the claims of the Trustee, the Collateral Agent, the Note Agents and the Holders allowed in any judicial proceedings relative to the Company (or any other obligor upon the Notes) or its creditors or property and (B) collect, receive and distribute any

money or other property payable or deliverable on any such claims. Each Holder authorizes any custodian in such proceeding to make such payments to the Trustee, and, if the Trustee consents to the making of such payments directly to the Holders, to pay to the Trustee any amount due to the Trustee, the Collateral Agent and the Note Agents for the reasonable compensation, expenses, disbursements and advances of the Trustee, the Collateral Agent and the Note Agents, and its agents and counsel, and any other amounts payable to the Trustee pursuant this Indenture or any Notes Document. To the extent that the payment of any such compensation, expenses, disbursements, advances and other amounts out of the estate in such proceeding, is denied for any reason, payment of the same will be secured by a lien on, and will be paid out of, any and all distributions, dividends, money, securities and other properties that the Holders may be entitled to receive in such proceeding (whether in liquidation or under any plan of reorganization or arrangement or otherwise). Nothing in this Indenture will be deemed to authorize the Trustee or the Collateral Agent to authorize, consent to, accept or adopt on behalf of any Holder any plan of reorganization, arrangement, adjustment or composition affecting the Notes or the rights of any Holder, or to authorize the Trustee or the Collateral Agent to vote in respect of the claim of any Holder in any such proceeding.

SECTION 7.11.PRIORITIES.

The Trustee will pay or deliver in the following order any money or other property that is collected pursuant to this **Article 7**:

First: to the Trustee, the Note Agents, the Collateral Agent and their and its agents and attorneys for amounts due under this Indenture and the Notes Documents, including payment of all fees, compensation, expenses, indemnification amounts and liabilities incurred, and all advances made, by the Trustee, the Note Agents or the Collateral Agent and the costs and expenses of collection;

Second: to Holders for unpaid amounts or other property due on the Notes, including the principal of, or the Redemption Price or Fundamental Change Repurchase Price for, or any interest on, or any Conversion Consideration due upon conversion of, the Notes, ratably, and without preference or priority of any kind, according to such amounts or other property due and payable on all of the Notes; and

Third: to the Company or such other Person as a court of competent jurisdiction directs.

The Trustee may fix a record date and payment date for any payment or delivery to the Holders pursuant to this **Section 7.11**, in which case the Trustee will instruct the Company to, and the Company will, deliver, at least fifteen (15) calendar days before such record date, to each Holder and the Trustee a notice stating such record date, such payment date and the amount of such payment or nature of such delivery, as applicable.

SECTION 7.12.UNDERTAKING FOR COSTS.

In any suit for the enforcement of any right or remedy under this Indenture or the Notes or in any suit against the Trustee or the Collateral Agent for any action taken or omitted by it as

Trustee or Collateral Agent , a court, in its discretion, may (A) require the filing by any litigant party in such suit of an undertaking to pay the costs of such suit, and (B) assess reasonable costs (including reasonable attorneys' fees) against any litigant party in such suit, having due regard to the merits and good faith of the claims or defenses made by such litigant party; *provided*, *however*, that this **Section 7.12** does not apply to any suit by the Trustee or Collateral Agent, any suit by a Holder pursuant to **Section 7.08** or any suit by one or more Holders of more than ten percent (10%) in aggregate principal amount of the Notes then outstanding.

Article 8.AMENDMENTS, SUPPLEMENTS AND WAIVERS

Section 8.01.Without the Consent of Holders.

Notwithstanding anything to the contrary in **Section 8.02**, the Company, the Guarantors, the Trustee and the Collateral Agent may amend or supplement any Notes Documents without the consent of any Holder to:

(A)cure any ambiguity or correct any omission, defect or inconsistency in this Indenture or the Notes;

(B)add guarantees with respect to the Company's obligations under this Indenture or the Notes, or to confirm and evidence the release, termination or discharge of any guarantee (including any Guarantee) with respect to the Notes when such release, termination or discharge is permitted under this Indenture or the other Notes Documents, as applicable;

(C)secure the Notes or any Guarantee, or to release Collateral from the Lien of this Indenture and the Collateral Documents when permitted or required by the Collateral Documents or this Indenture;

(D)add to the Company's or any Guarantor's covenants or Events of Default for the benefit of the Holders or surrender any right or power conferred on the Company;

(E)provide for the assumption of the Company's or any Guarantor's obligations under the Notes Documents pursuant to, and in compliance with, **Article 6** and **Article 9**, as applicable;

(F)enter into supplemental indentures pursuant to, and in accordance with, **Section 5.09** in connection with a Common Stock Change Event;

(G)evidence or provide for the acceptance of the appointment, under this Indenture, of a successor Trustee;

(H)[Reserved];

(I) [Reserved];

(J) comply with any requirement of the SEC in connection with any qualification of this Indenture or any supplemental indenture under the Trust Indenture Act, as then in effect; or

(K)make any other change to any Notes Document that does not, individually or in the aggregate with all other such changes, adversely affect the rights of the Holders, as such, in any material respect (other than Holders that have consented to such change).

SECTION 8.02.WITH THE CONSENT OF HOLDERS.

(A)*Generally*. Subject to **Sections 8.01**, **7.05** and **7.08** and the immediately following sentence, the Company, the Guarantors, the Trustee and the Collateral Agent may, with the consent of the Required Holders, amend or supplement any Notes Document or waive compliance with any provision of any Notes Document. Notwithstanding anything to the contrary in the foregoing sentence, but subject to **Section 8.01**, without the consent of each affected Holder, no amendment or supplement to any Notes Document, or waiver of any provision of any Notes Document, may:

(i) reduce the principal, or extend the stated maturity, of any Note;

(ii) reduce the Redemption Price or Fundamental Change Repurchase Price for any Note or change the times at which, or the circumstances under which, the Notes may or will be redeemed or repurchased by the Company;

(iii) reduce the rate, or extend the time for the payment, of interest on any Note;

(iv) make any change that adversely affects the conversion rights of any Note;

(v) impair the rights of any Holder set forth in **Section 7.08** (as such section is in effect on the Issue Date);

(vi) change the ranking of the Notes or the Guarantees, change the lien priority or payment priority of the Notes or the Guarantees, release any Guarantee except as permitted by the terms of the Notes Documents, or subordinate the Notes, the liens securing the Notes, or the Guarantees to any other Indebtedness of the Company except as permitted by the terms of the Notes Documents;

(vii) make any Note payable in money, or at a place of payment, other than that stated in this Indenture or the Note;

(viii) reduce the amount of Notes whose Holders must consent to any amendment, supplement, waiver or other modification; or

(ix) make any direct or indirect change to any amendment, supplement, waiver or modification provision of any Notes Document that requires the consent of each affected Holder.

For the avoidance of doubt, pursuant to **clauses (i)**, **(ii)**, **(iii)** and **(iv)** of this **Section 8.02(A)**, no amendment or supplement to any Notes Document, or waiver of any provision of any Notes Document, may change the amount or type of consideration due on any Note (whether on an Interest Payment Date, Redemption Date, Fundamental Change Repurchase Date or the Maturity Date or upon conversion, or otherwise), or the date(s) or time(s) such consideration is payable or deliverable, as applicable, without the consent of each affected Holder.

In addition, without the consent of (x) the Holders of at least 66 2/3% in principal amount of Notes then outstanding and (y) the Holders of at least 66 2/3% in principal amount of Notes then outstanding held by Persons who are not Affiliates of the Company and its Subsidiaries, no amendment, supplement or waiver may modify any Collateral Document or the provisions in this Indenture dealing with the Collateral or the Collateral Documents in a manner that would (i) have the impact of releasing all or substantially all of the Collateral from the Liens of the Collateral Documents (except as permitted by the terms of this Indenture or the Collateral Documents) or (ii) permit the Company to issue additional Notes under this Indenture (except as permitted as of the date hereof) or incur Indebtedness that is pari passu with the Notes as it relates to the Collateral.

(B)*Holders Need Not Approve the Particular Form of any Amendment*. A consent of any Holder pursuant to this **Section 8.02** need approve only the substance, and not necessarily the particular form, of the proposed amendment, supplement or waiver.

SECTION 8.03.NOTICE OF AMENDMENTS, SUPPLEMENTS AND WAIVERS.

As soon as reasonably practicable after any amendment, supplement or waiver pursuant to **Section 8.01** or **8.02** becomes effective, the Company will send to the Holders and the Trustee notice that (A) describes the substance of such amendment, supplement or waiver in reasonable detail and (B) states the effective date thereof; *provided*, *however*, that the Company will not be required to provide such notice to the Holders if such amendment, supplement or waiver is included in a periodic report filed by the Company with the SEC within four (4) Business Days of its effectiveness. The failure to send, or the existence of any defect in, such notice will not impair or affect the validity of such amendment, supplement or waiver.

SECTION 8.04.REVOCATION, EFFECT AND SOLICITATION OF CONSENTS; SPECIAL RECORD DATES; ETC.

(A)*Revocation and Effect of Consents*. The consent of a Holder of a Note to an amendment, supplement or waiver will bind (and constitute the consent of) each subsequent Holder of any Note to the extent the same evidences any portion of the same indebtedness as the consenting Holder's Note, subject to the right of any Holder of a Note to revoke (if not prohibited pursuant to **Section 8.04(B)**) any such consent with respect to such Note by delivering notice of revocation to the Trustee before the time such amendment, supplement or waiver becomes effective.

(B)*Special Record Dates*. The Company may, but is not required to, fix a record date for the purpose of determining the Holders entitled to consent or take any other action in connection with any amendment, supplement or waiver pursuant to this **Article 8**. If a record date is fixed, then, notwithstanding anything to the contrary in **Section 8.04(A)**, only Persons who are Holders as of such record date (or their duly designated proxies) will be entitled to give such consent, to revoke any consent previously given or to take any such action, regardless of whether such Persons continue to be Holders after such record date; *provided*, *however*, that no such consent will be valid or effective for more than one hundred and twenty (120) calendar days after such record date.

(C)*Solicitation of Consents*. For the avoidance of doubt, each reference in this Indenture or the Notes to the consent of a Holder will be deemed to include any such consent obtained in connection with a repurchase of, or tender or exchange offer for, any Notes.

(D)*Effectiveness and Binding Effect*. Each amendment, supplement or waiver pursuant to this **Article 8** will become effective in accordance with its terms and, when it becomes effective with respect to any Note (or any portion thereof), will thereafter bind every Holder of such Note (or such portion).

Section 8.05.Notations and Exchanges.

If any amendment, supplement or waiver changes the terms of a Note, then the Company may, in its discretion, require the Holder of such Note to deliver such Note to the Trustee so that the Trustee may place an appropriate notation prepared by the Company on such Note and return such Note to such Holder. Alternatively, at its discretion, the Company may, in exchange for such Note, issue, execute and deliver, and the Trustee will authenticate, in each case in accordance with **Section 2.02**, a new Note that reflects the changed terms. The failure to make any appropriate notation or issue a new Note pursuant to this **Section 8.05** will not impair or affect the validity of such amendment, supplement or waiver.

Section 8.06.Trustee and Collateral Agent to Execute Supplemental Indentures.

The Trustee and Collateral Agent will execute and deliver any amendment or supplemental indenture authorized pursuant to this **Article 8**; *provided*, *however*, that the Trustee and Collateral Agent need not (but may, in its sole and absolute discretion) execute or deliver any such amendment or supplemental indenture that affects the Trustee's, any Note Agent's or the Collateral Agent's rights, duties, liabilities or immunities. In executing any amendment or supplemental indenture, the Trustee and Collateral Agent will be entitled to receive, and (subject to **Sections 10.01** and **10.02**) will be fully protected in relying on, an Officer's Certificate and an Opinion of Counsel stating that (A) the execution and delivery of such amendment or supplemental indenture is authorized or permitted by this Indenture; and (B) in the case of the Opinion of Counsel, such amendment or supplemental indenture is valid, binding and enforceable against the Company (and any Guarantor) in accordance with its terms.

Article 9.SATISFACTION AND DISCHARGE; DEFEASANCE OF CERTAIN COVENANTS

Section 9.01.Termination of Company's Obligations.

This Indenture will be discharged, and will cease to be of further effect as to all Notes issued under this Indenture, when:

(A)all Notes then outstanding (other than Notes replaced pursuant to **Section 2.13**) have (i) been delivered to the Trustee for cancellation; or (ii) become due and payable (whether on a Redemption Date, a Fundamental Change Repurchase Date, the Maturity Date, upon conversion or otherwise) for an amount of cash or Conversion Consideration, as applicable, that has been fixed;

(B)the Company has caused there to be irrevocably deposited with the Trustee, or with the Paying Agent (or, with respect to Conversion Consideration, the Conversion Agent), in each case for the benefit of the Holders, or has otherwise caused there to be delivered to the Holders, cash (or, with respect to Notes to be converted, Conversion Consideration) sufficient to satisfy all amounts or other property due on all Notes then outstanding (other than Notes replaced pursuant to **Section 2.13**);

(C)the Company has paid all other amounts payable by it under this Indenture; and

(D)the Company has delivered to the Trustee an Officer's Certificate and an Opinion of Counsel, each stating that the conditions precedent to the discharge of this Indenture have been satisfied;

provided, *however*, that **Article 10** and **Section 11.01** will survive such discharge and, until no Notes remain outstanding, **Section 2.15** and the obligations of the Trustee, the Paying Agent and the Conversion Agent with respect to money or other property deposited with them will survive such discharge.

At the Company's request, the Trustee will acknowledge the satisfaction and discharge of this Indenture.

SECTION 9.02.REPAYMENT TO COMPANY.

Subject to applicable unclaimed property law, the Trustee, the Paying Agent and the Conversion Agent will, at the Company's written request, promptly deliver to the Company any cash, Conversion Consideration or other property held by any of them for payment or delivery on the Notes that remain unclaimed two (2) years after the date on which such payment or delivery was due. After such delivery to the Company, the Trustee, the Paying Agent and the Conversion Agent will have no further liability to any Holder with respect to such cash, Conversion Consideration or other property, and Holders entitled to the payment or delivery of such cash, Conversion Consideration or other property must look to the Company for payment as a general creditor of the Company.

SECTION 9.03.REINSTATEMENT.

If the Trustee, the Paying Agent or the Conversion Agent is unable to apply any cash or other property deposited with it pursuant to **Section 9.01** because of any legal proceeding or any order or judgment of any court or other governmental authority that enjoins, restrains or otherwise prohibits such application, then the discharge of this Indenture pursuant to **Section 9.01** will be rescinded; *provided*, *however*, that if the Company thereafter pays or delivers any cash or other property due on the Notes to the Holders thereof, then the Company will be subrogated to the rights of such Holders to receive such cash or other property from the cash or other property, if any, held by the Trustee, the Paying Agent or the Conversion Agent, as applicable.

SECTION 9.04.DEFEASANCE OF RESTRICTIVE COVENANTS.

If:

(A)the Company has caused there to be irrevocably deposited, with the Trustee or the Paying Agent for the benefit of the Holders, cash in an aggregate amount equal to the sum of (i) the remaining scheduled interest payments on each Note outstanding as of the time of such deposit (assuming, for these purposes, that Additional Interest and Special Interest would accrue on such Note at their respective maximum rates per annum); and (ii) one hundred percent (100%) of the principal amount of each Note outstanding as of the time of such deposit (excluding, in the case of each of **sub-clause (i)** and **(ii)** above, any Notes referred to in **Section 9.04(B)** as to which the deposit referred to in **Section 9.04(B)** is made);

(B)with respect to each Note, if any, for which a Conversion Date has occurred, but the Conversion Consideration due in respect of such Note has not been fully paid or delivered, as of the time of the deposit referred to in **Section 9.04(A)**, the Company has caused there to be irrevocably deposited for the benefit of the Holders, with a bank or trust company selected by the Company that is a corporation organized and doing business under the laws of the United States of America or of any state thereof, that is authorized under such laws to exercise corporate trustee power, that is subject to supervision or examination by federal or state authorities and that has a combined capital and surplus of at least $100.0 million as set forth in its most recent published annual report of condition, in an account for which the Trustee or the Paying Agent has control of such account pursuant to an account control agreement if applicable, the maximum kind and amount of Conversion Consideration due in respect of such Note (together, if applicable, with (i) cash in the amount of any interest due on such Note pursuant to **clause (i)** of **Section 5.02(D)**; and (ii) an amount of cash equal to the Applicable Premium);

(C)the Company has instructed the Trustee or the Paying Agent, as applicable, to pay or deliver cash due on the Notes from the cash deposited pursuant to **Section 9.04(A)** as the same becomes due and the Company has provided for the delivery of other property due on the Notes from such property deposited pursuant to **Section 9.04(B)** as the same becomes due;

(D)as of the time of the deposits referred to in **Section 9.04(A)** and **Section 9.04(B)**, no default in the payment or delivery of any amount or property (including Conversion Consideration) on any Note has occurred and is continuing;

(E)the Company has delivered to the Trustee an Opinion of Counsel confirming that the Holders will not recognize any income, gain or loss for federal income tax purposes as a result of the Covenant Defeasance and will be subject to federal income tax on the same amounts, in the same manner and at the same times, as would have been the case if such Covenant Defeasance had not occurred;

(F)such Covenant Defeasance will not result in a breach or violation of, or constitute a default under, any material agreement or instrument (other than this Indenture, but solely in connection with the incurrence of any indebtedness to finance such Covenant Defeasance) to which the Company is a party or by which the Company is bound;

(G)the Company has delivered to the Trustee an Officer's Certificate stating that the deposits referred to in **Section 9.04(A)** and **Section 9.04(B)** were not made by the Company with the intent of preferring the Holders over the other creditors of the Company with the intent of defeating, hindering, delaying or defrauding any creditors of the Company or others; and

(H)the Company has delivered to the Trustee an Officer's Certificate and an Opinion of Counsel, each stating that all conditions precedent relating to such Covenant Defeasance have been complied with,

then, notwithstanding anything to the contrary in this Indenture or the Notes, **Section 3.09, Section 3.10, Section 3.11, Section 3.12, Section 3.13** and **Section 3.14** will thereafter cease to be of any force or effect, and, for the avoidance of doubt, any omission to thereafter comply with **Section 3.09** will not in itself constitute a Default or Event of Default under the Notes. For the avoidance of doubt, the remainder of this Indenture and the Notes will be unaffected by and Covenant Defeasance and will continue to be in full force and effect.

Each of the Trustee and the Paying Agent will return to the Company any cash or other property deposited with it pursuant to **Section 9.04(A)** and **Section 9.04(B)** that remains on deposit after (x) all Notes have been paid in full and none remain outstanding; and (y) the Company has paid all other amounts payable by it under this Indenture.

Article 10.TRUSTEE

SECTION 10.01.DUTIES OF THE TRUSTEE.

(A)If an Event of Default has occurred and is continuing, the Trustee will exercise such of the rights and powers vested in it by this Indenture, and use the same degree of care and skill in its exercise, as a prudent person would exercise or use under the circumstances in the conduct of such person's own affairs.

(B)Except during the continuance of an Event of Default:

(i) the duties of the Trustee will be determined solely by the express provisions of this Indenture, and the Trustee need perform only those duties that are specifically set forth in this Indenture and no others, and no implied covenants or obligations will be read into this Indenture against the Trustee;

(ii) the Trustee shall not be liable, answerable or accountable under any circumstances, except for its own gross negligence, or willful misconduct, as conclusively determined by the final judgment of a court of competent jurisdiction, no longer subject to appeal or review; and

(iii) in the absence of gross negligence or willful misconduct on its part, the Trustee may conclusively rely, as to the truth of the statements and the correctness of the opinions expressed therein, upon any certificates or Opinions of Counsel that are provided to the Trustee and conform to the requirements of this Indenture. However, the Trustee will examine the certificates and opinions to determine whether or not they conform to the

requirements of this Indenture (but need not confirm or investigate the accuracy or mathematical calculation or facts stated therein).

(C)The Trustee may not be relieved from liabilities for its gross negligence, or willful misconduct, as conclusively determined by the final judgment of a court of competent jurisdiction, no longer subject to appeal or review, except that:

(i) this paragraph will not limit the effect of **Section 10.01(B)**;

(ii) the Trustee will not be liable for any error of judgment made in good faith by a Responsible Officer, unless it is proved that the Trustee was grossly negligent in ascertaining the pertinent facts, as conclusively determined by the final judgment of a court of competent jurisdiction, no longer subject to appeal or review; and

(iii) the Trustee will not be liable with respect to any action it takes or omits to take in good faith in accordance with a direction received by it from the Company pursuant to the terms of the Indenture or any Notes Document, from the Required Holders or from such other percentage of Holders expressly contemplated by this Indenture.

(D)Each provision of this Indenture and the Notes Documents that in any way relates to the Trustee is subject to this Article X, regardless of whether such provision so expressly provides.

(E)No provision of this Indenture will require the Trustee to expend or risk its own funds or incur any liability nor shall the Trustee be required to give any bond or surety in respect of the performance of its powers and duties hereunder.

(F)The Trustee will not be liable for interest on any money received by it, except as the Trustee may agree in writing with the Company. Money held in trust by the Trustee need not be segregated from other funds, except to the extent required by law.

(G)The Trustee will not be liable with respect to any action taken or omitted to be taken by it in good faith in accordance with the written direction of the Required Holders relating to the time, method and place of conducting any proceeding for any remedy available to the Trustee, or exercising any trust or power conferred upon the Trustee, under this Indenture.

SECTION 10.02.RIGHTS OF THE TRUSTEE.

(A)The Trustee may conclusively rely on and be fully protected in acting or refraining from acting upon any document (whether in its original or facsimile form) that it believes to be genuine and signed or presented by the proper Person, and the Trustee need not investigate any fact or matter stated in such document.

(B)Before the Trustee acts or refrains from acting, it may require an Officer's Certificate, an Opinion of Counsel or both. The Trustee will not be liable for any action it takes or omits to take in good faith in reliance on such Officer's Certificate or Opinion of Counsel. The Trustee may consult with counsel; and the written advice of such counsel, or any Opinion of

Counsel, will constitute full and complete authorization of the Trustee to take or omit to take any action in good faith in reliance thereon without liability.

(C)The Trustee may act through its attorneys and agents and will not be responsible for the misconduct or negligence of any such agent appointed with due care.

(D)The Trustee will not be liable for any action it takes or omits to take in good faith and that it believes to be authorized or within the rights or powers vested in it by this Indenture.

(E)Unless otherwise specifically provided in this Indenture, any demand, request, direction or notice from the Company will be sufficient if signed by an Officer of the Company.

(F)The Trustee need not exercise any rights or powers vested in it by this Indenture or any other Notes Document at the request or direction of any Holder unless such Holder has offered the Trustee security or indemnity satisfactory to the Trustee against any loss, liability or expense that it may incur in complying with such request or direction.

(G)The Trustee will not be responsible or liable for any punitive, special, indirect or consequential loss or damage (including lost profits), even if the Trustee has been advised of the likelihood of such loss or damage and regardless of the form of action.

(H)The Trustee will not be bound to make any investigation into: (i) the facts or matters stated in any resolution, certificate, statement, instrument, opinion, report, notice, request, direction, consent, order, bond, debenture or other paper or document, but the Trustee, in its discretion, may make such further inquiry or investigation into such facts or matters as it may see fit and will incur no liability of any kind by reason of such inquiry or investigation, (ii) the performance or observance by the Company or any other Person of any of the covenants, agreements or other terms or conditions set forth in this Indenture or in any other Notes Document, or (iii) the occurrence of any default, or the validity, enforceability, effectiveness or genuineness of this Indenture, any other Notes Document or any other agreement, instrument or document or any collateral or Lien.

(I) The Trustee will not be deemed to have notice or knowledge of any Default or Event of Default unless a Responsible Officer of the Trustee has received written notice at its Corporate Trust Office, and such notice references the existence of a Default or Event of Default, the Notes and this Indenture.

(J) The permissive rights of the Trustee enumerated in this Indenture will not be construed as duties.

(K)The rights, privileges, protections, immunities, and benefits given to the Trustee, including its right to be indemnified, are extended to, and will be enforceable by, the Trustee in each of its capacities under this Indenture (including in its capacity as Collateral Agent, Conversion Agent, Paying Agent, and Registrar), and each agent, custodian and other Person employed to act under this Indenture or the Notes Documents; provided, however, that with regards thereto: (i) references to "negligence" shall be references to "gross negligence"; and (ii) during an Event of Default, only the Trustee (acting solely in its capacity as Trustee) shall be subject to the prudent Person standard of Section 10.01(A), and will be enforceable in each other Notes Document or

document related hereto to which the Trustee, Collateral Agent, Conversion Agent, Paying Agent or Registrar is a party or otherwise subject, whether or not specifically set forth therein.

(L)If the Trustee requests instructions from the Company or the Holders with respect to any action or omission in connection with this Indenture, the Trustee shall be entitled (without incurring any liability therefor) to refrain from taking such action and continue to refrain from acting unless and until the Trustee shall have received written instructions from the Company or the Required Holders, as applicable, with respect to such request. For purposes of clarity, but without limiting any rights, protections, immunities or indemnities afforded to the Trustee hereunder (including without limitation this Article 11), phrases such as "satisfactory to the Trustee," "approved by the Trustee," "acceptable to the Trustee," "as determined by the Trustee," "in the Trustee's discretion," "selected by the Trustee," "elected by the Trustee," "requested by the Trustee," and phrases of similar import that authorize or permit the Trustee to approve, disapprove, determine, act or decline to act in its discretion shall be subject to the Trustee receiving written direction from the Required Holders to take such action or to exercise such rights. Nothing contained in this Indenture or any other Notes Document shall require the Trustee to exercise any discretionary acts.

(M)The Trustee shall not be liable for failing to comply with its obligations under this Indenture or any other Notes Document in so far as the performance of such obligations is dependent upon the timely receipt of instructions and/or other information from any other person which are not received or not received by the time required.

(N)The Trustee shall not be liable in failing or refusing to take any action under this Indenture or any other Notes Document if the taking of such action, in the reasonable opinion of the Trustee (which may be based on the advice or opinion of counsel), (i) would violate applicable law, this Indenture or such other Notes Document or (ii) is not provided for in this Indenture or such other Notes Document.

(O)The Trustee shall not be required to take any action under this Indenture or any other Notes Document if taking such action (A) would subject the Trustee to a tax in any jurisdiction where it is not then subject to a tax or (B) would require the Trustee to qualify to do business in any jurisdiction where it is not then so qualified.

(P)The Trustee will not be charged with knowledge of any document or agreement other than this Indenture and the Notes.

(Q)The Trustee may consult with counsel and an opinion or advise of such counsel or any Opinion of Counsel will be full and complete authorization and protection from liability in respect of any action take, suffered or omitted by it hereunder in good faith in reliance thereon.

(R)The Trustee may, from time to time, request that the Company and any other applicable party deliver a certificate (upon which the Trustee may conclusively rely) setting forth the names of individuals and/or titles of officers authorized at such time to take specified actions pursuant to this Indenture or any related document together with a specimen signature of such authorized officers; provided, however, that from time to time, the Company or such other applicable party may, by delivering to the Trustee a revised certificate, change the information

previously provided by it, but the Trustee shall be entitled to conclusively rely on the then current certificate until receipt of a superseding certificate.

Section 10.03.Individual Rights of the Trustee.

The Trustee, in its individual or any other capacity, may become the owner or pledgee of any Note and may otherwise deal with the Company or any of its Affiliates with the same rights that it would have if it were not Trustee; *provided*, *however*, that if the Trustee acquires a "conflicting interest" (within the meaning of Section 310(b) of the Trust Indenture Act), then it must eliminate such conflict within ninety (90) days or resign as Trustee. Each Note Agent will have the same rights and duties as the Trustee under this **Section 10.03**.

Section 10.04.Trustee's Disclaimer.

The Trustee will not be (A) responsible for, and makes no representation as to, the validity or adequacy of this Indenture or the Notes or the Notes Documents; (B) accountable for the Company's use of the proceeds from the Notes or any money paid to the Company or upon the Company's direction under any provision of this Indenture; (C) responsible for the use or application of any money received by any Paying Agent other than the Trustee; and (D) responsible for any statement or recital in this Indenture, the Notes, the Guarantees or any other document relating to the sale of the Notes or this Indenture, other than the Trustee's certificate of authentication.

Section 10.05.Notice of Defaults.

If a Default or Event of Default occurs and is continuing and is known to the Trustee, then the Trustee will send Holders a notice of such Default or Event of Default within ninety (90) days after it occurs or, if it is not known to the Trustee at such time, promptly (and in any event within ten (10) Business Days) after it becomes known to a Responsible Officer of the Trustee; *provided*, *however*, that, except in the case of a Default or Event of Default in the payment of the principal of, or interest on, any Note, the Trustee may withhold such notice if and for so long as it in good faith determines that withholding such notice is in the interests of the Holders.

Section 10.06.Compensation and Indemnity.

(A)The Company will, from time to time, pay the Trustee, the Collateral Agent and the Note Agents reasonable compensation for its acceptance of this Indenture and services under this Indenture and the other Notes Documents, as separately agreed by the Company and the Trustee. Such compensation will not be limited by any law on compensation of a trustee of an express trust. In addition to such compensation, the Company will reimburse the Trustee, the Collateral Agent and the Note Agents promptly upon request for all reasonable disbursements, advances and expenses incurred or made by it under this Indenture, including the reasonable compensation, disbursements and expenses of their agents and counsel.

(B)The Company and Guarantors will, jointly and severally, indemnify the Trustee, the Collateral Agent and each Note Agent (including for the cost of defending itself) against any and all losses, liabilities or expenses incurred by it arising out of or in connection with the

acceptance or administration of its duties under this Indenture and the other Notes Documents, including the costs and expenses of enforcing this Indenture against the Company or Guarantors (including this **Section 10.06**) and defending itself against any claim (whether asserted by the Company, any Holder or any other Person) or liability in connection with the exercise or performance of any of its powers or duties under this Indenture and the other Notes Documents, except to the extent any such loss, liability or expense is proved to be attributable to its gross negligence or willful misconduct, as determined by a final decision of a court of competent jurisdiction. The Trustee, the Collateral Agent or applicable Note Agent will promptly notify the Company of any claim for which it may seek indemnity, but the Trustee's, the Collateral Agent's or applicable Note Agent's failure to so notify the Company will not relieve the Company of its obligations under this **Section 10.06(B)**. The Company will defend such claim, and the Trustee, the Collateral Agent or applicable Note Agent, as applicable, will cooperate in such defense. If the Trustee, the Collateral Agent or any Note Agent is advised by counsel that it may have defenses available to it that are in conflict with the defenses available to the Company, or that there is an actual or potential conflict of interest, then the Trustee, the Collateral Agent or Note Agent, as applicable, may retain separate counsel, and the Company will pay the reasonable fees and expenses of such counsel (including the reasonable fees and expenses of counsel to the Trustee, the Collateral Agent and Note Agents incurred in evaluating whether such a conflict exists). The Company need not pay for any settlement of any such claim made without its consent, which consent will not be unreasonably withheld.

(C)The obligations of the Company under this **Section 10.06** will survive the resignation or removal of the Trustee and the defeasance or discharge of this Indenture.

(D)To secure the Company's payment obligations in this **Section 10.06**, the Trustee will have a lien prior to the Notes on all money or property held or collected by the Trustee, except that held in trust to pay principal of, or interest on, particular Notes, which lien will survive the discharge of this Indenture.

(E)If the Trustee incurs expenses or renders services after an Event of Default pursuant to **clause (ix)** or **(x)** of **Section 7.01(A)** occurs, then such expenses and the compensation for such services (including the fees and expenses of its agents and counsel) are intended to constitute expenses of administration under any Bankruptcy Law.

SECTION 10.07.REPLACEMENT OF THE TRUSTEE.

(A)Notwithstanding anything to the contrary in this **Section 10.07**, a resignation or removal of the Trustee, and the appointment of a successor Trustee, will become effective only upon such successor Trustee's acceptance of appointment as provided in this **Section 10.07**.

(B)The Trustee may resign at any time and be discharged from the trust created by this Indenture by so notifying the Company. The Required Holders may remove the Trustee by so notifying the Trustee and the Company in writing. The Company may remove the Trustee if:

(i) the Trustee fails to comply with **Section 10.09**;

(ii) the Trustee is adjudged to be bankrupt or insolvent or an order for relief is entered with respect to the Trustee under any Bankruptcy Law;

(iii) a custodian or public officer takes charge of the Trustee or its property; or

(iv) the Trustee becomes incapable of acting.

(C)If the Trustee resigns or is removed, or if a vacancy exists in the office of the Trustee for any reason, then (i) the Company will promptly appoint a successor Trustee; and (ii) at any time within one (1) year after the successor Trustee takes office, the Required Holders may appoint a successor Trustee to replace such successor Trustee appointed by the Company.

(D)If a successor Trustee does not take office within sixty (60) days after the retiring Trustee resigns or is removed, then the retiring Trustee, the Company or the Holders of at least ten percent (10%) in aggregate principal amount of the Notes then outstanding may petition any court of competent jurisdiction for the appointment of a successor Trustee.

(E)If the Trustee, after written request by a Holder of at least six (6) months, fails to comply with **Section 10.09**, then such Holder may petition any court of competent jurisdiction for the removal of the Trustee and the appointment of a successor Trustee.

(F)A successor Trustee will deliver a written acceptance of its appointment to the retiring Trustee and to the Company, upon which notice the resignation or removal of the retiring Trustee will become effective and the successor Trustee will have all the rights, powers and duties of the Trustee under this Indenture. The successor Trustee will send notice of its succession to Holders. The retiring Trustee will, upon payment of all amounts due to it under this Indenture, promptly transfer all property held by it as Trustee to the successor Trustee, which property will, for the avoidance of doubt, be subject to the lien provided for in **Section 10.06(D)**.

SECTION 10.08.SUCCESSOR TRUSTEE BY MERGER, ETC.

If the Trustee consolidates, merges or converts into, or transfers all or substantially all of its corporate trust business to, another Person, then such Person will become the successor Trustee without any further act.

SECTION 10.09.ELIGIBILITY; DISQUALIFICATION.

There will at all times be a Trustee under this Indenture that is a corporation organized and doing business under the laws of the United States of America or of any state thereof, that is authorized under such laws to exercise corporate trustee power, that is subject to supervision or examination by federal or state authorities.

Article 11.MISCELLANEOUS

SECTION 11.01.NOTICES.

Any notice or communication by the Company or the Trustee to the other will be deemed to have been duly given if in writing and delivered in person or by first class mail (registered or certified, return receipt requested), facsimile transmission, electronic transmission or other similar

means of unsecured electronic communication or overnight air courier guaranteeing next day delivery, or to the other's address, which initially is as follows:

If to the Company:

Biora Therapeutics, Inc.
4330 La Jolla Village Drive
Suite 300
San Diego, California 92122
Attention: General Counsel

with a copy (which will not constitute notice) to:

Gibson, Dunn & Crutcher LLP
3161 Michelson Drive
Irvine, California 92612
Attention: Ryan Murr, Esq.

If to the Trustee:

GLAS Trust Company LLC
3 Second Street, Suite 206
Jersey City, NJ 07311
Attn. TMGUS/Biora Therapeutics, Inc.

The Company or the Trustee, by notice to the other, may designate additional or different addresses (including facsimile numbers and electronic addresses) for subsequent notices or communications.

All notices and communications (other than those sent to Holders) will be deemed to have been duly given: (A) at the time delivered by hand, if personally delivered; (B) five (5) Business Days after being deposited in the mail, postage prepaid, if mailed; (C) when receipt acknowledged, if transmitted by facsimile, electronic transmission or other similar means of unsecured electronic communication; and (D) the next Business Day after timely delivery to the courier, if sent by overnight air courier guaranteeing next day delivery.

All notices or communications required to be made to a Holder pursuant to this Indenture must be made in writing and will be deemed to be duly sent or given in writing if mailed by first class mail, certified or registered, return receipt requested, or by overnight air courier guaranteeing next day delivery, to its address shown on the Register; *provided*, *however*, that a notice or communication to a Holder of a Global Note may, but need not, instead be sent pursuant to the Depositary Procedures (in which case, such notice will be deemed to be duly sent or given in writing). The failure to send a notice or communication to a Holder, or any defect in such notice or communication, will not affect its sufficiency with respect to any other Holder.

If the Trustee is then acting as the Depositary's custodian for the Notes, then, at the reasonable request of the Company to the Trustee, the Trustee will cause any notice prepared by

the Company to be sent to any Holder(s) pursuant to the Depositary Procedures, *provided* such request is evidenced in a Company Order delivered, together with the text of such notice, to the Trustee at least two (2) Business Days before the date such notice is to be so sent. For the avoidance of doubt, such Company Order need not be accompanied by an Officer's Certificate or Opinion of Counsel. The Trustee will not have any liability relating to the contents of any notice that it sends to any Holder pursuant to any such Company Order.

If a notice or communication is mailed or sent in the manner provided above within the time prescribed, it will be deemed to have been duly given, whether or not the addressee receives it.

Notwithstanding anything to the contrary in this Indenture or the Notes, (A) whenever any provision of this Indenture requires a party to send notice to another party, no such notice need be sent if the sending party and the recipient are the same Person acting in different capacities; and (B) whenever any provision of this Indenture requires a party to send notice to more than one receiving party, and each receiving party is the same Person acting in different capacities, then only one such notice need be sent to such Person.

SECTION 11.02.DELIVERY OF OFFICER'S CERTIFICATE AND OPINION OF COUNSEL AS TO CONDITIONS PRECEDENT.

Upon any request or application by the Company to the Trustee to take or refrain from taking any action under this Indenture (other than the initial authentication of Notes under this Indenture) or any Notes Document, the Company will furnish to the Trustee:

(A)an Officer's Certificate in form and substance reasonably satisfactory to the Trustee that complies with **Section 11.03** and states that, in the opinion of the signatory thereto, all conditions precedent and covenants, if any, provided for in this Indenture and each Notes Document relating to such action have been satisfied; and

(B)an Opinion of Counsel in form and substance reasonably satisfactory to the Trustee that complies with **Section 11.03** and states that, in the opinion of such counsel, all such conditions precedent and covenants, if any, have been satisfied.

SECTION 11.03.STATEMENTS REQUIRED IN OFFICER'S CERTIFICATE AND OPINION OF COUNSEL.

Each Officer's Certificate (other than an Officer's Certificate pursuant to **Section 3.05**) or Opinion of Counsel with respect to compliance with a covenant or condition provided for in this Indenture will include:

(A)a statement that the signatory thereto has read such covenant or condition;

(B)a brief statement as to the nature and scope of the examination or investigation upon which the statements or opinions contained therein are based;

(C)a statement that, in the opinion of such signatory, he, she or it has made such examination or investigation as is necessary to enable him, her or it to express an informed opinion as to whether or not such covenant or condition has been satisfied; and

(D)a statement as to whether, in the opinion of such signatory, such covenant or condition has been satisfied.

Section 11.04.Rules by the Trustee, the Registrar and the Paying Agent.

The Trustee may make reasonable rules for action by or at a meeting of Holders. The Conversion Agent, Registrar or Paying Agent may make reasonable rules and set reasonable requirements for its functions.

Section 11.05.No Personal Liability of Directors, Officers, Employees and Stockholders.

No past, present or future director, officer, employee, incorporator or stockholder of the Company, as such, will have any liability for any obligations of the Company under this Indenture or the Notes or for any claim based on, in respect of, or by reason of, such obligations or their creation. By accepting any Note, each Holder waives and releases all such liability. Such waiver and release are part of the consideration for the issuance of the Notes.

Section 11.06.Governing Law; Waiver of Jury Trial.

THIS INDENTURE AND THE NOTES, AND ANY CLAIM, CONTROVERSY OR DISPUTE ARISING UNDER OR RELATED TO THIS INDENTURE OR THE NOTES, WILL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK. EACH OF THE COMPANY, THE GUARANTORS, THE TRUSTEE AND THE COLLATERAL AGENT, AND EACH HOLDER BY ACCEPTANCE OF ITS NOTE, IRREVOCABLY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATING TO THIS INDENTURE, THE NOTES OR THE TRANSACTIONS CONTEMPLATED BY THIS INDENTURE OR THE NOTES.

Section 11.07.Submission to Jurisdiction.

Any legal suit, action or proceeding arising out of or based upon this Indenture or the transactions contemplated by this Indenture may be instituted in the federal courts of the United States of America located in the City of New York or the courts of the State of New York, in each case located in the City of New York (collectively, the "**Specified Courts**"), and each party irrevocably submits to the exclusive jurisdiction of such courts in any such suit, action or proceeding. Service of any process, summons, notice or document by mail (to the extent allowed under any applicable statute or rule of court) to such party's address set forth in **Section 11.01** will be effective service of process for any such suit, action or proceeding brought in any such court. Each of the Company, the Trustee and each Holder (by its acceptance of any Note) irrevocably and unconditionally waives any objection to the laying of venue of any suit, action or other proceeding in the Specified Courts and irrevocably and unconditionally waives and agrees not to plead or claim any such suit, action or other proceeding has been brought in an inconvenient forum.

Section 11.08.No Adverse Interpretation of Other Agreements.

Neither this Indenture nor the Notes may be used to interpret any other indenture, note, loan or debt agreement of the Company or its Subsidiaries or of any other Person, and no such indenture, note, loan or debt agreement may be used to interpret this Indenture or the Notes.

Section 11.09.Successors.

All agreements of the Company in this Indenture and the Notes will bind its successors. All agreements of the Trustee in this Indenture will bind its successors.

Section 11.10.Force Majeure.

The Trustee, Collateral Agent and each Note Agent will not incur any liability for not performing any act or fulfilling any duty, obligation or responsibility under this Indenture or the Notes by reason of any occurrence beyond its control (including any act or provision of any present or future law or regulation or governmental authority, work stoppage, pandemic, act of God or war, civil unrest, local or national disturbance or disaster, act of terrorism or unavailability of the Federal Reserve Bank wire or facsimile or other wire or communication facility).

Section 11.11.U.S.A. PATRIOT Act.

The Company acknowledges that, in accordance with Section 326 of the U.S.A. PATRIOT Act, the Trustee, like all financial institutions, in order to help fight the funding of terrorism and money laundering, is required to obtain, verify and record information that identifies each person or legal entity that establishes a relationship or opens an account with the Trustee. The Company agrees to provide the Trustee with such information as it may request to enable the Trustee to comply with the U.S.A. PATRIOT Act.

Section 11.12.Calculations.

Except as otherwise provided in this Indenture, the Company will be solely responsible for making all calculations called for under this Indenture or the Notes. These calculations include, but are not limited to, any related to an interest payment methodology, the Last Reported Sale Price, any make-whole amount, premium, accrued interest on the Notes or the Conversion Rate.

The Company will make all calculations in good faith, and, absent manifest error, its calculations will be final and binding on all Holders. The Company will provide a schedule of its calculations to the Trustee and each Note Agent, and the Trustee and each Note Agent may rely conclusively on the accuracy of the Company's calculations without independent verification. The Trustee will make available a copy of each such schedule to a Holder upon its written request therefor. Neither the Trustee nor any Note Agent shall have any responsibility to verify or determine the accuracy of any calculations or amounts, including those related to any interest, premium or make-whole payments, or interest or make-whole payment methodologies. In addition, neither the Trustee nor any Note Agent shall have any responsibility for determining whether events requiring or permitting conversion have occurred, determining whether any

adjustment is required to be made with respect to conversion rights and, if so, the amount, or for the delivery of Common Stock.

SECTION 11.13.SEVERABILITY.

If any provision of this Indenture or the Notes is invalid, illegal or unenforceable, then the validity, legality and enforceability of the remaining provisions of this Indenture or the Notes will not in any way be affected or impaired thereby.

SECTION 11.14.COUNTERPARTS.

The parties may sign any number of copies of this Indenture. Each signed copy will be an original, and all of them together represent the same agreement. Delivery of an executed counterpart of this Indenture by facsimile, electronically in portable document format or in any other format will be effective as delivery of a manually executed counterpart.

SECTION 11.15.TABLE OF CONTENTS, HEADINGS, ETC.

The table of contents and the headings of the Articles and Sections of this Indenture have been inserted for convenience of reference only, are not to be considered a part of this Indenture and will in no way modify or restrict any of the terms or provisions of this Indenture.

SECTION 11.16.WITHHOLDING TAXES.

The Company, the Trustee, the Paying Agent or other applicable withholding agent shall be entitled to deduct and withhold from the consideration otherwise payable pursuant to or under a Note such amounts as it is required to deduct and withhold under the Internal Revenue Code, or any tax law, with respect to the making of such payment. To the extent that amounts are so withheld, such withheld amounts shall be treated for all purposes as having been paid to the Person in respect of whom such deduction and withholding was made. Each Holder of a Note agrees, and each beneficial owner of an interest in a Global Note, by its acquisition of such interest, is deemed to agree, that if the Company, the Trustee, the Paying Agent or other applicable withholding agent pays withholding taxes or backup withholding on behalf of such Holder or beneficial owner as a result of an adjustment or the non-occurrence of an adjustment to the Conversion Rate or otherwise, then the Company, the Trustee, the Paying Agent or such withholding agent, as applicable, may, at its option, set off such payments against payments of cash or the delivery of other Conversion Consideration on such Note, any payments on the Common Stock or sales proceeds received by, or other funds or assets of, such Holder or the beneficial owner of such Note.

SECTION 11.17.SANCTIONS.

(a)The Company and each Guarantor covenant and represent that neither it nor any of its affiliates, subsidiaries, directors or officers are the target or subject of any sanctions enforced by the US Government, (including, the Office of Foreign Assets Control of the US Department of the Treasury ("**OFAC**")), the United Nations Security Council, the European Union, HM Treasury, or other relevant sanctions authority (collectively "**Sanctions**").

(b) The Company and each Guarantor covenant and represent that neither it nor any of its affiliates, subsidiaries, directors or officers will use any payments made pursuant to Indenture, (i) to fund or facilitate any activities of or business with any person who, at the time of such funding or facilitation, is the subject or target of Sanctions, (ii) to fund or facilitate any activities of or business with any country or territory that is the target or subject of Sanctions, or (iii) in any other manner that will result in a violation of Sanctions by any person.

Article 12.COLLATERAL

SECTION 12.01.COLLATERAL DOCUMENTS.

The payment of the principal, interest (including Additional Interest) and premium, if any, on the Notes when due, whether on an Interest Payment Date, at maturity, by acceleration, repurchase, redemption or otherwise, the payment of all other Obligations of the Company and Guarantors under this Indenture and the other Notes Documents and performance of all other obligations of the Company and Guarantors to the Secured Parties under this Indenture, the other Notes Documents and the Notes, and the due and punctual payment of all Guaranteed Obligations, according to the terms hereunder or thereunder, are secured as provided in the Collateral Documents, which the Collateral Agent and the Company have entered into simultaneously with the execution of this Indenture, and will be secured by Collateral Documents delivered after the date of this Indenture as required or permitted by this Indenture.

SECTION 12.02.COLLATERAL AGENT.

(A)The Collateral Agent agrees that it will hold the Collateral created under the Collateral Documents to which it is a party as contemplated by this Indenture, and any and all proceeds thereof, for the benefit of, the Secured Parties, without limiting the Collateral Agent's rights, including under this **Section 12.02**, to act, when directed by the Required Holders, in preservation of the security interest in the Collateral. The Collateral Agent is authorized and empowered, when directed by the Required Holders, to appoint one or more co-Collateral Agents as may be necessary or appropriate; provided, however, that no Collateral Agent hereunder shall be personally liable by reason of any act or omission of any other Collateral Agent hereunder.

(B)Neither the Trustee nor the Collateral Agent nor any of their respective officers, directors, employees, attorneys or agents will be responsible or liable for the existence, genuineness, value or protection of any Collateral, for the legality, enforceability, effectiveness, or sufficiency of the Collateral Documents, for the creation, perfection, continuation, priority, sufficiency or protection of any Lien, including without limitation not being responsible for payment of any taxes, charges or assessments upon the Collateral or otherwise as to the maintenance of the Collateral, or for any defect or deficiency as to any such matters, or to monitor the status of any Lien or performance of the Collateral, or for any failure to demand, collect, foreclose or realize upon or otherwise enforce any of the Liens or Collateral Documents or any delay in doing so. Neither the Trustee nor the Collateral Agent nor any of their respective officers, directors, employees, attorneys or agents will be responsible or liable for making any filings or recordings to perfect or maintain the perfection of the Collateral Agent's Lien in the Collateral, including without limitation, the filing of any UCC financing statements, continuation statements, or any filings with respect to the U.S. Patent and Trademark Office or U.S. Copyright Office.

(C)The Collateral Agent will be subject to such directions as may be given to it by the Required Holders or the Trustee (as directed by the Required Holders) from time to time. Except as so directed , and only if indemnified to its satisfaction, the Collateral Agent will not be obligated:

(i) to act upon direction purported to be delivered to it by any Person;

(ii) to foreclose upon or otherwise enforce any Lien created under the Collateral Documents; or

(iii) to take any other action whatsoever with regard to any or all of the Liens, Collateral Documents or Collateral.

The Collateral Agent will be accountable only for amounts that it actually receives as a result of the enforcement of the Liens or Collateral Documents.

(D)In acting as Collateral Agent hereunder and under the Collateral Documents, the Collateral Agent shall be afforded, and shall be entitled to enforce, each and all of the rights, privileges, protections, immunities, indemnities and benefits of the Trustee in this Indenture and the other Notes Documents, including, without limitation, under **Article 10**; *provided* that in that context any references in this Indenture to "Trustee" shall be references to "Collateral Agent", references to "negligence" shall be references to "gross negligence" and Section 10.01(A) does not apply to the Collateral Agent. Without limiting the immediately preceding sentence, the Collateral Agent shall be entitled to compensation, reimbursement and indemnity in the same manner as the Trustee as provided in **Section 10.06**.

(E)At all times when the Trustee is not itself the Collateral Agent, the Company will deliver to the Trustee copies of all Collateral Documents delivered to the Collateral Agent and copies of all documents delivered to the Collateral Agent pursuant to the Collateral Documents.

(F)Notwithstanding any provision to the contrary contained elsewhere in this Indenture and the Collateral Documents, the duties of the Collateral Agent shall be ministerial and administrative in nature, and the Collateral Agent shall not have any duties or responsibilities, except those expressly set forth herein and in the Collateral Documents, to which the Collateral Agent is a party, nor shall the Collateral Agent have or be deemed to have any trust or other fiduciary relationship with the Trustee, any Holder, or any other party, and no implied covenants, functions, responsibilities, duties, obligations or liabilities shall be read into this Indenture and the Collateral Documents, or otherwise exist against the Collateral Agent. Without limiting the generality of the foregoing sentence, the use of the term "agent" in this Indenture with reference to the Collateral Agent is not intended to connote any fiduciary or other implied (or express) obligations arising under agency doctrine of any applicable law. Instead, such term is used merely as a matter of market custom, and is intended to create or reflect only an administrative relationship between independent contracting parties.

(G)The Collateral Agent shall not be deemed to have knowledge or notice of the occurrence of any Default or Event of Default, unless a Responsible Officer of the Collateral Agent shall have received written notice from the Company referring to this Indenture, describing such Default or Event of Default and stating that such notice is a "notice of default." Subject to its

rights hereunder, the Collateral Agent shall take such action with respect to such Default or Event of Default as may be requested by the Required Holders or the Trustee (acting at the direction of the Required Holders) in accordance with the terms hereof.

(H)No provision of this Indenture or any Collateral Document shall require the Collateral Agent to expend or risk its own funds or otherwise incur any financial liability in the performance of any of its duties hereunder or thereunder or to take or omit to take any action hereunder or thereunder or take any action at the request or direction of Holders or the Trustee unless it shall have received indemnity satisfactory to the Collateral Agent against potential costs and liabilities incurred by the Collateral Agent relating thereto. Notwithstanding anything to the contrary contained in this Indenture or the Collateral Documents, in the event the Collateral Agent is entitled or required to commence an action to foreclose or otherwise exercise its remedies to acquire control or possession of the Collateral, the Collateral Agent shall not be required to commence any such action or exercise any remedy or take any such other action if the Collateral Agent has determined that the Collateral Agent may incur personal liability as a result of the presence at, or release on or from, the Collateral or such property, of any hazardous substances. The Collateral Agent shall at any time be entitled to cease taking any action if it no longer reasonably deems any indemnity, security or undertaking from the Company or the Holders to be sufficient.

(I) The parties hereto and the Holders hereby agree and acknowledge that neither the Collateral Agent nor the Trustee shall assume, be responsible for or otherwise be obligated for any liabilities, claims, causes of action, suits, losses, allegations, requests, demands, penalties, fines, settlements, damages (including foreseeable and unforeseeable), judgments, expenses and costs (including but not limited to, any remediation, corrective action, response, removal or remedial action, or investigation, operations and maintenance or monitoring costs, for personal injury or property damages, real or personal) of any kind whatsoever, pursuant to any environmental law as a result of this Indenture, the Collateral Documents or any actions taken pursuant hereto or thereto. Further, the parties hereto and the Holders hereby agree and acknowledge that in the exercise of its rights under this Indenture and the Collateral Documents, the Collateral Agent and the Trustee may hold or obtain indicia of ownership primarily to protect the security interest of the Collateral Agent or the Trustee, as applicable, in the Collateral and that any such actions taken by the Collateral Agent or the Trustee shall not be construed as or otherwise constitute any participation in the management of such Collateral. In the event that the Collateral Agent or the Trustee is required to acquire title to an asset for any reason, or take any managerial action of any kind in regard thereto, in order to carry out any obligation for the benefit of another, which in either the Collateral Agent's or Trustee's sole discretion may cause the Collateral Agent or Trustee, as applicable, to be considered an "owner or operator" under the provisions of the Comprehensive Environmental Response, Compensation and Liability Act ("**CERCLA**"), 42 U.S.C. §9601, et seq., or otherwise cause the Collateral Agent or Trustee, as applicable, to incur liability under CERCLA or any other federal, state or local law, the Collateral Agent and the Trustee reserves the right, instead of taking such action, to either resign or arrange for the transfer of the title or control of the asset to a court-appointed receiver. Neither the Collateral Agent nor the Trustee shall be liable to any person for any environmental claims or contribution actions under any federal, state or local law, rule or regulation by reason of the Collateral Agent's or the Trustee's actions and conduct as authorized, empowered and directed hereunder or relating to the discharge, release or threatened release of hazardous materials into the environment. If at any time it is necessary or

advisable for property to be possessed, owned, operated or managed by any person (including the Collateral Agent or the Trustee) other than the Company, the Required Holders shall direct the Collateral Agent or the Trustee to appoint an appropriately qualified Person (excluding the Collateral Agent or the Trustee) who they shall designate to possess, own, operate or manage, as the case may be, the property.

(J) The Collateral Agent shall be fully justified in failing or refusing to take any action under this Indenture or the Collateral Documents unless it shall be directed by the Trustee (acting at the direction of the Required Holders) or the Required Holders. If the Collateral Agent so requests, it shall first be indemnified to its satisfaction by the Holders against any and all liability and expense which may be incurred by it by reason of taking or continuing to take any such action. The Collateral Agent and the Trustee shall in all cases be fully protected in acting, or in refraining from acting, under this Indenture or the Collateral Documents in accordance with a request, direction, instruction, or consent of the Required Holders or, in the case of the Collateral Agent, at the request, direction, instruction, or consent of the Trustee (acting at the direction of the Required Holders). Such request and any action taken or failure to act pursuant thereto shall be binding upon all of the Holders.

(K)Except as otherwise explicitly provided herein or in the Collateral Documents, the Collateral Agent, the Trustee nor any of their respective officers, directors, employees or agents shall be liable for failure to demand, collect or realize upon any of the Collateral or for any delay in doing so or shall be under any obligation to sell or otherwise dispose of any Collateral upon the request of any other Person or to take any other action whatsoever with regard to the Collateral or any part thereof.

(L)The Collateral Agent and the Trustee assumes no responsibility for any failure or delay in performance or any breach by the Company or any other grantor under this Indenture and the Collateral Documents. The Collateral Agent and the Trustee shall not have any obligation to any Holder or any other Person to ascertain or inquire into the existence of any Default or Event of Default, the observance or performance by any obligor of any terms of this Indenture or the Collateral Documents, or the satisfaction of any conditions precedent contained in this Indenture or any Collateral Documents. The Collateral Agent and the Trustee shall not be required to initiate or conduct any litigation or collection or other proceeding under this Indenture or the Collateral Documents.

(M)Subject to the provisions of the applicable Collateral Documents and this Indenture, each Holder, by acceptance of the Notes, agrees that the Collateral Agent and the Trustee shall execute and deliver such intercreditor agreements as it may be presented from time to time and the Collateral Documents to which it is a party and all agreements, documents and instruments incidental thereto (including any releases permitted hereunder), and act in accordance with the terms thereof. For the avoidance of doubt, the Collateral Agent shall not be required to exercise discretion under this Indenture or the Collateral Documents and shall not be required to make or give any determination, consent, approval, request or direction without the Required Holders or the Trustee (acting at the direction of the Required Holders).

(N)The Trustee, acting at the direction of the Required Holders, may direct the Collateral Agent in connection with any action required or permitted by this Indenture or the Collateral Documents.

(O)Subject to the terms of this Indenture and the Collateral Documents, in each case that the Collateral Agent may or is required hereunder or under any other Notes Documents to take any action (an "Action"), including but not limited to making any determination, giving consents, exercising rights, powers, or remedies, releasing or selling Collateral, or otherwise acting hereunder or under any other Notes Documents, the Collateral Agents may seek direction from the Required Holders. The Collateral Agent shall not be liable with respect to any Action taken or omitted to be taken by it in accordance with such direction. Subject to the terms of the Collateral Documents, if the Collateral Agent shall request direction from the Required Holders with respect to any Action, the Collateral Agent shall be entitled to refrain from such Action unless and until such Collateral Agent shall have received such direction, and the Collateral Agent and Trustee shall not incur liability to any Person by reason of so refraining.

(P)Beyond the exercise of reasonable care in the custody thereof, neither the Collateral Agent nor the Trustee shall have any duty as to any Collateral in its possession or control or in the possession or control of any agent or bailee or any income thereon or as to preservation of rights against prior parties or any other rights pertaining thereto. The Collateral Agent shall be deemed to have exercised reasonable care in the custody of the Collateral in its possession if the Collateral is accorded treatment substantially equal to that which it accords property of similar customers and shall not be liable or responsible for any loss or diminution in the value of any of the Collateral, by reason of the act or omission of any carrier, forwarding agency or other agent or bailee selected by the Collateral Agent in good faith.

SECTION 12.03.RELEASE OF COLLATERAL; NON-DISTURBANCE.

(A)Subject to **Section 12.03(b)** and **(c)** hereof, the Liens on the Collateral securing the Notes will be automatically released in whole or in part, as applicable, under one or more of the following circumstances:

(i) in whole upon satisfaction and discharge of this Indenture as set forth under **Article 9**;

(ii) in whole or in part, as applicable, with the consent of the requisite Holders of the Notes in accordance with **Article 8**, including consents obtained in connection with a tender offer or exchange offer, or purchase of Notes; or

(iii) in part, as to any asset constituting Collateral:

(A) that is sold, transferred or otherwise disposed of by the Company to any Person in a transaction permitted by this Indenture or the Collateral Documents; or

(B) to the extent such asset ceases to be Collateral or is no longer required to be Collateral as a result of any transaction or any other event not prohibited by this Indenture.

(B)Upon the request of the Company (and at the Company's expense), the Collateral Agent shall enter into an intercreditor agreement in connection with any Indebtedness secured by a Lien permitted under this Indenture and bind the Holders on the terms set forth therein and perform and observe its obligations thereunder; *provided* that the Company shall deliver to the Collateral Agent an Officer's Certificate attesting that such intercreditor agreement is on customary terms for such Indebtedness and that such Lien is permitted under the Indenture and the other Notes Documents and the Collateral Agent shall be fully protected in acting in conclusive reliance on such Officer's Certificate.

(C)With respect to any release of the Liens on the Collateral or the entry into an intercreditor agreement as provided in **Section 12.03(B)** above, upon receipt of an Officer's Certificate and (solely with respect to **Section 12.03(A)**) an Opinion of Counsel each stating that all conditions precedent under this Indenture and the Notes Documents to such release or the entry into such agreements have been met and that the execution and delivery by the Trustee or the Collateral Agent of the documents requested by the Company in connection with such release or the entry into such agreements is authorized and permitted by this Indenture and the other Notes Documents, and in the case of any release any appropriate instruments of termination, satisfaction, discharge or release prepared by the Company (in form and substance reasonably satisfactory to the Trustee and the Collateral Agent, without representation or warranty), the Trustee and the Collateral Agent shall execute, deliver or acknowledge (at the Company's expense) such instruments or releases as are requested to evidence the release and discharge of any Collateral permitted to be released pursuant to this Indenture. Neither the Trustee nor the Collateral Agent shall be liable for any such release or the entry into any non-disturbance undertaken in reliance upon any such Officer's Certificate or Opinion of Counsel, and notwithstanding any term hereof or in any Collateral Document to the contrary, the Trustee and the Collateral Agent shall not be under any obligation to release any such Lien and security interest, or execute and deliver any such instrument of release, satisfaction, discharge or termination, unless and until such party receives such Officer's Certificate and (if applicable) Opinion of Counsel.

(D)At any time when an Event of Default has occurred and is continuing and the maturity of the Notes has been accelerated (whether by declaration or otherwise) and the Trustee (acting at the direction of the Required Holders) has delivered notice of acceleration to the Collateral Agent, no release of the Liens on the Collateral pursuant to the provisions of this Indenture or the Collateral Documents shall be effective as against the Holders.

SECTION 12.04.SUITS TO PROTECT THE COLLATERAL.

Subject to the provisions of the Collateral Documents, the Trustee is authorized and empowered, but not obligated, to institute and maintain, or direct (at the direction of the Required Holders) the Collateral Agent to institute and maintain, such suits and proceedings to protect or enforce the Liens securing the Notes or to prevent any impairment of the Collateral by any acts which may be unlawful or in violation of any of the Collateral Documents or this Indenture, and such suits and proceedings to preserve or protect its interest and the interests of the Holders of the

Notes in the Collateral (including suits or proceedings to restrain the enforcement of or compliance with any legislative or other governmental enactment, rule or order that may be unconstitutional or otherwise invalid if the enforcement of, or compliance with, such enactment, rule or order would impair the Liens created under the Collateral Documents or be prejudicial to the interests of the Holders of the Notes). Nothing in this Section 12.04 shall be considered to impose any such duty or obligation to act on the part of the Trustee or any Collateral Agent.

SECTION 12.05.AUTHORIZATION OF ACTION TO BE TAKEN.

(A)Each Holder of Notes consents and agrees to the terms of each Collateral Document, as originally in effect and as amended, restated, amended and restated, supplemented or otherwise modified or replaced from time to time in accordance with its terms or the terms of this Indenture, authorizes and directs the Trustee and the Collateral Agent to enter into the Collateral Documents to which such party is a party, authorizes and empowers the Trustee and the Collateral Agent to bind the Holders of Notes as set forth in the Collateral Documents to which either such party is party and to perform its respective obligations and exercise its respective rights and powers thereunder. Any request, demand, authorization, direction, notice, consent, waiver, approval, exercise of judgment or discretion, designation or other action provided or permitted by this Indenture to be given, taken or exercised by the Collateral Agent, shall be given, taken or exercised by the Collateral Agent at the direction of the Required Holders or the Trustee acting at the direction of the Required Holders. Any notice, agreement, certificate or other document delivered to the Collateral Agent by the Company or any other Person in connection with any of this Indenture or the Collateral Documents, shall promptly be delivered by the Collateral Agent to the Trustee.

(B)The Collateral Agent and the Trustee are authorized and empowered to receive for the benefit of the Secured Parties any funds collected or distributed under the Collateral Documents to which the Collateral Agent or the Trustee is a party and to make further distributions of such funds according to the provisions of this Indenture.

(C)Subject to the provisions of **Section 10.01** and **Section 10.02**, the Trustee may (but shall not be obligated to), in its sole discretion and without the consent of any Holders, during the continuance of an Event of Default, direct, on behalf of the Holders, the Collateral Agent to take all actions it deems necessary or appropriate in order to:

(i) foreclose upon or otherwise enforce any or all of the Liens created under the Collateral Documents;

(ii) enforce any of the terms of the Collateral Documents to which the Collateral Agent or Trustee is a party; or

(iii) collect and receive payment of any and all Obligations to the extent then due and payable.

Nothing in this Section 12.05 shall be considered to impose any such duty or obligation to act on the part of the Trustee or the Collateral Agent.

Section 12.06. Purchaser Protection.

In no event shall any purchaser in good faith of any property purported to be released hereunder be bound to ascertain the authority of the Collateral Agent or the Trustee to execute the release or to inquire as to the satisfaction of any conditions required by the provisions hereof for the exercise of such authority or to see the application of any consideration given by such purchaser or other transferee; nor shall any purchaser or other transferee of any property or rights permitted by this **Article 12** to be sold be under any obligation to ascertain or inquire into the authority of the Company to make any such sale or other transfer.

Section 12.07. Powers Exercisable by Receiver or Trustee.

In case the Collateral shall be in the possession of a receiver or trustee, lawfully appointed, the powers conferred in this **Article 12** upon the Company with respect to the release, sale or other disposition of such property may be exercised by such receiver or trustee, and an instrument signed by such receiver or trustee shall be deemed the equivalent of any similar instrument of the Company or of any Responsible Officer or Responsible Officers thereof required by the provisions of this **Article 12**; and if the Trustee, Collateral Agent, or their nominee or agent, shall be in possession of the Collateral under any provision of this Indenture, then such powers may be exercised by the Trustee, the Collateral Agent, or their nominee or agent.

Section 12.08.Release Upon Termination of the Company's Obligations.

In the event that the Company delivers, in addition to the Officer's Certificate and Opinion of Counsel required by **Section 11.02** to the Trustee and the Collateral Agent an Officer's Certificate certifying that payment in full of the principal of, together with any premium and accrued and unpaid interest on, the Notes and all other Obligations under this Indenture and the Collateral Documents that are due and payable at or prior to the time such principal, together with any premiums and accrued and unpaid interest, are paid, and that it is authorized and permitted under the Indenture and the Notes Documents for the Trustee or the Collateral Agent to acknowledge the release of the security interests in the Collateral and execute and deliver the documents (in form and substance satisfactory to the Trustee and the Collateral Agent) prepared and requested by the Company in connection with such release, the Collateral Agent shall deliver to the Company an acknowledgement of the release of such security interests in the Collateral (in form and substance satisfactory to the Trustee and the Collateral Agent) prepared and requested by the Company and shall execute, deliver or acknowledge (at the Company's expense) such instruments or releases (in form and substance satisfactory to the Trustee and the Collateral Agent) prepared and requested by the Company to evidence the release and discharge of any security interests in the Collateral permitted to be released pursuant to this Indenture. Neither the Trustee nor the Collateral Agent shall be liable for any such release undertaken in reliance upon any such Officer's Certificate or Opinion of Counsel, and notwithstanding any term hereof or in any other Notes Document to the contrary, the Trustee and the Collateral Agent shall not be under any obligation to execute and deliver any such instrument of release, satisfaction, discharge or termination, unless and until it receives such Officer's Certificate and Opinion of Counsel.

SECTION 12.09.COLLATERAL AGENT; COLLATERAL DOCUMENTS.

(A)GLAS Trust Company LLC is hereby designated and appointed as the Collateral Agent of the Secured Parties under this Indenture and the Collateral Documents and GLAS Trust Company LLC hereby accepts such designation and appointment.

(B)By their acceptance of the Notes, the Holders hereby authorize and direct the Trustee and Collateral Agent, as the case may be, to execute and deliver any Collateral Documents in which the Trustee or the Collateral Agent, as applicable, is named as a party, including any Collateral Documents executed after the date of this Indenture. It is hereby expressly acknowledged and agreed that, in doing so, the Trustee and the Collateral Agent are (a) expressly authorized to make the representations attributed to the Holders in any such agreements and (b) not responsible for the terms or contents of such agreements, or for the validity or enforceability thereof, or the sufficiency thereof for any purpose. Whether or not so expressly stated therein, in entering into, or taking (or forbearing from) any action under, any Collateral Documents, the Trustee and the Collateral Agent each shall have all the rights, privileges, immunities, indemnities and other benefits and protections granted to it under this Indenture (in addition to those that may be granted to it under the terms of such other Collateral Document or Collateral Documents).

(C)If the Company or any of its Subsidiaries (i) incurs any Indebtedness that is required to be subject to an intercreditor agreement, and (ii) delivers to the Collateral Agent and Trustee an Officer's Certificate so stating and certifying that the execution of such intercreditor agreement is authorized and permitted by the Indenture and the other Notes Documents and all conditions precedent to its execution have been satisfied, and requesting the Collateral Agent and Trustee, if applicable, to enter into an intercreditor agreement in favor of a designated agent or representative for the holders of such Indebtedness so incurred, the Collateral Agent and the Trustee (as applicable) shall (and are hereby authorized and directed to) enter into such intercreditor agreement (at the sole expense and cost of the Company, including fees (including legal fees) and expenses of the Collateral Agent and Trustee), bind the Holders on the terms set forth therein and perform and observe its obligations thereunder. Neither the Trustee nor the Collateral Agent shall be liable for any such execution in reliance upon any such Officer's Certificate, and notwithstanding any term hereof or in any other Notes Document to the contrary, the Trustee and the Collateral Agent shall not be under any obligation to execute and deliver any such instrument of release, satisfaction, discharge or termination, unless and until it receives such Officer's Certificate.

SECTION 12.10.REPLACEMENT OF COLLATERAL AGENT.

(A)The Collateral Agent may resign at any time by so notifying the Company in writing not less than 45 days prior to the effective date of such resignation. The Required Holders may remove the Collateral Agent by so notifying the removed Collateral Agent in writing not less than 45 days prior to the effective date of such removal and may appoint a successor Collateral Agent with the Company's written consent. If:

(i) The Collateral Agent shall cease to be eligible in accordance with the provisions of **Section 10.07** and shall fail to resign after written request therefor by the Company or by any Holder,

(ii) The Collateral Agent shall become incapable of acting, or shall be adjudged a bankrupt or insolvent, or a receiver of the Collateral Agent or of its property shall be appointed, or any public officer shall take charge or control of the Collateral Agent or of its property or affairs for the purpose of rehabilitation, conservation or liquidation; or

(iii) the Collateral Agent otherwise becomes incapable of acting

then, the Company may by a resolution of the Board of Directors remove the Collateral Agent and appoint a successor collateral agent by written instrument, in duplicate, executed by order of the Board of Directors, one copy of which instrument shall be delivered to the Collateral Agent so removed and one copy to the successor collateral agent, or, subject to the provisions of **Section 12.11**, any Holder who has been a bona fide holder of a Note or Notes for at least six months (or since the date of this Indenture) may, on behalf of itself and all others similarly situated, petition, at the Company's expense, any court of competent jurisdiction for the removal of the Collateral Agent and the appointment of a successor Collateral Agent. Such court may thereupon, after such notice, if any, as it may deem proper and prescribe, remove the Collateral Agent and appoint a successor Collateral Agent.

(B)Any corporation or other entity into which the Collateral Agent may be merged or converted or with which it may be consolidated, or any corporation or other entity resulting from any merger, conversion or consolidation to which the Collateral Agent shall be a party, or any corporation or other entity succeeding to all or substantially all of the corporate trust business of the Collateral Agent (including the administration of this Indenture) shall be the successor to the Collateral Agent hereunder without the execution or filing of any paper or any further act on the part of any of the parties hereto.

SECTION 12.11.ACCEPTANCE BY COLLATERAL AGENT.

Any successor Collateral Agent appointed as provided in **Section 12.10** shall execute, acknowledge and deliver to the Company and to its predecessor Collateral Agent an instrument accepting such appointment hereunder, and thereupon the resignation or removal of the predecessor Collateral Agent shall become effective and such successor Collateral Agent, without any further act, deed or conveyance, shall become vested with all the rights, powers, duties and obligations of its predecessor hereunder, with like effect as if originally named as Collateral Agent herein; but, nevertheless, on the written request of the Company or of the successor Collateral Agent, the Collateral Agent ceasing to act shall, at the expense of the Company and subject to payment of any amounts then due pursuant to the provisions of **Section 10.06**, execute and deliver an instrument transferring to such successor Collateral Agent all the rights and powers of the Collateral Agent so ceasing to act. Upon request of any such Collateral Agent, the Company shall execute any and all instruments in writing for more fully and certainly vesting in and confirming to such successor Collateral Agent all such rights and powers. Any Collateral Agent ceasing to act shall, nevertheless, retain a senior claim to which the Notes are hereby made subordinate on all money or property held or collected by such Collateral Agent as such, except for funds held in trust for the benefit of Holders of particular Notes, to secure any amounts then due it pursuant to the provisions of **Section 10.06**.

No successor Collateral Agent shall accept appointment as provided in this **Section 12.11** unless at the time of such acceptance such successor Collateral Agent shall be eligible under the provisions of **Section 10.09**.

Upon acceptance of appointment by a successor Collateral Agent as provided in **Section 12.10**, each of the Company and the successor Collateral Agent, at the written direction and at the expense of the Company, shall give or cause to be given notice of the succession of such Collateral Agent hereunder to the Holders in accordance with **Section 11.01**. If the Company fails to give such notice within ten days after acceptance of appointment by the successor Collateral Agent, the successor Collateral Agent shall cause such notice to be given at the expense of the Company.

Article 13.GUARANTEES

SECTION 13.01.GUARANTEES.

(A)By its execution of this Indenture (including by any amended or supplemental indenture), each Guarantor acknowledges and agrees that it receives substantial benefits from the Company and that such Guarantor is providing its Guarantee for good and valuable consideration, including such substantial benefits. Subject to this **Article 13**, each of the Guarantors hereby, as a primary obligor and not merely as surety, jointly and severally, fully and unconditionally guarantees, to each Holder of a Note authenticated by the Trustee and to the Trustee, the Collateral Agent, the Note Agents and their successors and assigns, regardless of the validity or enforceability of this Indenture, the Notes, the Notes Documents or the obligations of the Company under this Indenture, the Notes Documents or the Notes, that:

(i) the principal of, premium, if any, interest on, and any Conversion Consideration for, the Notes and such other Obligations will be promptly paid in full when due, whether at maturity, by acceleration, on a Fundamental Change Repurchase Date, Redemption Date or otherwise, and interest on the overdue principal of, any interest on, or any Conversion Consideration for, the Notes, if lawful, and all other obligations of the Company to the Secured Parties under this Indenture, the Notes Documents or the Notes, will be promptly paid or delivered in full or performed, as applicable, in each case in accordance with this Indenture and the Notes; and

(ii) in case of any extension of time of payment or renewal of any Notes or any of such other obligations, that the same will be promptly paid in full when due or performed in accordance with the terms of the extension or renewal, whether at stated maturity, by acceleration, on a Fundamental Change Repurchase Date, Redemption Date or otherwise, (clause (i) and (ii) collectively, the "**Guaranteed Obligations**"), in each case subject to **Section 13.02**.

Upon the failure of any payment when due of any amount so guaranteed, and upon the failure of any performance so guaranteed, for whatever reason, the Guarantors will be jointly and severally obligated to pay or perform, as applicable, the same immediately. Each Guarantor agrees that this is a guarantee of payment and not a guarantee of collection.

(B)Each Guarantor agrees that its Guarantee of the Guaranteed Obligations is unconditional, regardless of the validity or enforceability of this Indenture, the Notes, the Notes

Documents or the obligations of the Company under this Indenture, the Notes Documents or the Notes, the absence of any action to enforce the same, any waiver or consent by any Holder with respect to any provisions of this Indenture or the Notes, the recovery of any judgment against the Company or any other Guarantor, any action to enforce the same or any other circumstance that might otherwise constitute a legal or equitable discharge or defense of a Guarantor other than payment or performance in full of Guaranteed Obligations (other than contingent obligations that have yet to accrue). Each Guarantor waives diligence, presentment, requirements for any demand or notice hereunder including any of the following: (i) any demand for payment or performance and protest and notice of protest; (ii) any notice of acceptance; (iii) any presentment, demand, protest or further notice or other requirements of any kind with respect to any Obligation (including any accrued but unpaid interest thereon) becoming immediately due and payable; and (iv) any other notice in respect of any Obligation or any part thereof, and any defense arising by reason of any disability or other defense of the Company or any Guarantor. Each Guarantor further unconditionally and irrevocably agrees not to (x) enforce or otherwise exercise any right of subrogation or any right of reimbursement or contribution or similar right against the Company or any Guarantor by reason of any Document or any payment made thereunder or (y) assert any claim, defense, setoff or counterclaim it may have against the Company or any other Guarantor or set off any of its obligations to the Company or any other Guarantor against obligations of such Guarantor to the Company or such other Guarantor. No obligation of any Guarantor hereunder shall be discharged other than by complete payment or performance of the Guaranteed Obligations (other than contingent obligations that have yet to accrue) in accordance with this Indenture, the Notes Documents and the Notes. Each Guarantor further waives any right such Guarantor may have under any applicable requirement of law to require the Trustee, the Collateral Agent, or any Holder to seek recourse first against the Company or any of its Subsidiaries or any other Person, or to realize upon any Collateral for any of the Obligations, as a condition precedent to enforcing such Guarantor's liability and obligations under this **Article 13**.

(C)If any Holder, the Trustee, or the Collateral Agent is required by any court or otherwise to return, to the Company, the Guarantors or any custodian, trustee, liquidator or other similar official acting in relation to the Company or the Guarantors, any amount paid or delivered by the Company, or any Guarantor to the Trustee, the Collateral Agent, or such Holder, this Guarantee, to the extent theretofore discharged, will be reinstated in full force and effect.

(D)Each Guarantor agrees that any right of subrogation, reimbursement or contribution it may have in relation to the Holders or in respect of any Guaranteed Obligations will be subordinated to, and will not be enforceable until payment in full and performance of, all Guaranteed Obligations. Each Guarantor further agrees that, as between the Guarantors, on the one hand, and the Holders, the Trustee and the Collateral Agent, on the other hand, (i) the maturity of the Guaranteed Obligations may be accelerated as provided in **Article 7**, notwithstanding any stay, injunction or other prohibition preventing such acceleration in respect of the Guaranteed Obligations; and (ii) if any Guaranteed Obligations are accelerated pursuant to **Article 7**, then such Guaranteed Obligations will, whether or not due and payable, immediately become due and payable by the Guarantors. Each Guarantor will have the right to seek contribution from any non-paying Guarantor, but only if the exercise of such right does not impair the rights of the Holders under any Guarantee.

SECTION 13.02.LIMITATION ON GUARANTOR LIABILITY.

Each Guarantor, and, by its acceptance of any Note, each Holder, confirms that each Guarantor and the Holders intend that the Guarantee of each Guarantor not constitute a fraudulent transfer or conveyance for purposes of Bankruptcy Law, the Uniform Fraudulent Conveyance Act, the Uniform Fraudulent Transfer Act or any similar federal or state law to the extent applicable to any Guarantee. Each of the Trustee, the Holders and each Guarantor irrevocably agrees that the obligations of each Guarantor under its Guarantee will be limited to the maximum amount that will, after giving effect to such maximum amount and all other contingent and fixed liabilities of such Guarantor that are relevant under such laws, and after giving effect to any collections from, rights to receive contribution from or payments made by or on behalf of any other Guarantor in respect of the obligations of such other Guarantor under its Guarantee, result in the obligations of such Guarantor under its Guarantee not constituting a fraudulent transfer or fraudulent conveyance under federal or state law and not otherwise being void or voidable under any similar laws affecting the rights of creditors generally.

SECTION 13.03.

The execution by each Guarantor of this Indenture (or by an amended or supplemental indenture pursuant to **Section 8.01(B)**) evidences the Guarantee of such Guarantor, and the delivery of any Note by the Trustee after its authentication constitutes due delivery of each Guarantee on behalf of each Guarantor. A Guarantee's validity will not be affected by the failure of any officer of a Guarantor executing this Indenture or any such amended or supplemental indenture on such Guarantor's behalf to hold, at the time any Note is authenticated, the same or any other office at each Guarantor, and each Guarantee will be valid and enforceable even if no notation, certificate or other instrument is set upon or attached to, or otherwise executed and delivered to the Holder of, any Note.

SECTION 13.04.WHEN GUARANTORS MAY MERGE, ETC..

(A)No Guarantor will consolidate with or merge with or into, or sell, lease or otherwise transfer, in one transaction or a series of transactions, all or substantially all of the assets of such Guarantor and its Subsidiaries, taken as a whole, to another Person (other than the Company or another Guarantor) (a "**Guarantor Business Combination Event**"), unless (1) the resulting, surviving or transferee Person (the "**Successor Guarantor**") is such Guarantor or, if not such Guarantor, expressly assumes (by executing and delivering to the Trustee, at or before the effective time of such Guarantor Business Combination Event, a supplemental indenture substantially in the form of Exhibit C) all of such Guarantor's obligations under this Indenture and the Notes; *provided* that (a) such surviving Guarantor shall be incorporated or organized under the laws of the United States of America, any State thereof or the District of Columbia and (b) no Default or Event of Default shall exist, or would result from such Guarantor Business Combination Event or (2) the transaction is in compliance with **Section 3.12**.

Notwithstanding the foregoing, any Guarantor may merge, consolidate, amalgamate or wind up with or into, or transfer all or part of its properties and assets to, the Company without regard to the requirements set forth in this **Section 13.04(A)**.

(B)Before the effective time of any Guarantor Business Combination Event, the Company will deliver to the Trustee an Officer's Certificate and Opinion of Counsel, each stating that (i) such Guarantor Business Combination Event (and, if applicable, the related supplemental indenture substantially in the form of Exhibit C) complies with Section 13.04(A); and (ii) all conditions precedent to such Guarantor Business Combination Event provided in this Indenture have been satisfied.

(C)At the effective time of any Guarantor Business Combination Event that complies with **Section 13.04(A)** and **Section 13.04(B)**, the Successor Guarantor (if not the applicable Guarantor) will succeed to, and may exercise every right and power of, such Guarantor under this Indenture and the Notes with the same effect as if such Successor Guarantor had been named as a Guarantor in this Indenture and the Notes, and, except in the case of a lease, the predecessor Guarantor will be discharged from its obligations under this Indenture and the Notes.

SECTION 13.05.APPLICATION OF CERTAIN PROVISIONS OF THE GUARANTORS.

(A)Upon any request or application by any Guarantor to the Trustee to take any action under this Indenture or any Notes Document, the Trustee will be entitled to receive an Officer's Certificate and an Opinion of Counsel pursuant to **Section 11.02** with the same effect as if each reference to the Company in Section **11.02** or in the definitions of "Officer," "Officer's Certificate" or "Opinion of Counsel" were instead a reference to such Guarantor.

(B)A Company Order may be given by any Guarantor with the same effect as if each reference to the Company in the definitions of "Company Order" or "Officer" were instead a reference to such Guarantor.

(C)Any notice or demand that this Indenture requires or permits to be given by the Trustee, or by any Holders, to the Company may instead be given to any Guarantor.

Any Guarantee by a Guarantor shall be automatically and unconditionally released and discharged, and no further action by such Guarantor, the Company or the Trustee is required for the release of such Guarantor's Guarantee, upon:

(i)

(1) any sale, exchange, transfer or other disposition (by merger, consolidation, amalgamation, dividend, distribution or otherwise) of all of the Capital Stock of such Guarantor or all or substantially all of the assets of such Guarantor, in each case, if such sale, exchange, transfer or other disposition is not prohibited by the applicable provisions of this Indenture and, (a) such sale, exchange, transfer or other disposition is in compliance with **Section 3.12** or (b) unless such sale, exchange, transfer or other disposition is with or to the Company, the surviving or transferee Person expressly assumes such Guarantor's obligations in accordance with **Section 13.04**;

(2) the merger, consolidation or amalgamation of any Guarantor with and into the Company, or upon the liquidation of a Guarantor following the transfer of all of its assets to the Company; or

(3) the merger, consolidation or amalgamation of any Guarantor with and into a Subsidiary of the Company where such Subsidiary is the surviving Person, if such merger, consolidation or amalgamation is not prohibited by the applicable provisions of this Indenture and such Subsidiary expressly assumes such Guarantor's obligations in accordance with **Section 13.04**; and

(ii) the Company and such Guarantor delivering to the Trustee an Officer's Certificate and an Opinion of Counsel, each stating that all conditions precedent provided for in this Indenture relating to such transaction and release have been complied with.

[***The Remainder of This Page Intentionally Left Blank; Signature Page Follows***]

IN WITNESS WHEREOF, the parties to this Indenture have caused this Indenture to be duly executed as of the date first written above.

BIORA THERAPEUTICS, INC.

By: /s/ Eric d'Esparbes
Name: Eric d'Esparbes
Title: Chief Financial Officer

GLAS TRUST COMPANY LLC, AS TRUSTEE AND COLLATERAL AGENT

By: /s/ Katie Fischer
Name: Katie Fischer
Title: Vice President

[Signature Page to Indenture]

EXHIBIT A

FORM OF NOTE

[*Insert Global Note Legend, if applicable*]

[*Insert Restricted Note Legend, if applicable*]

[*Insert Non-Affiliate Legend, if applicable*]

[Insert "PIK NOTE", if applicable]

BIORA THERAPEUTICS, INC.

11.00% / 13.00% Convertible Senior Secured Note due 2028

CUSIP No.: [___][*Insert for a "restricted" CUSIP number*:] Certificate No. [___]
ISIN No.: [___][*Insert for a "restricted" ISIN number*: *]

Biora Therapeutics, Inc., a Delaware corporation, for value received, promises to pay to [Cede & Co.], or its registered assigns, the principal sum of [___] dollars ($[___]) [(as revised by the attached Schedule of Exchanges of Interests in the Global Note)] on December 19, 2028 or, if earlier, the Maturity Date, and to pay interest thereon, as provided in the Indenture referred to below, until the principal and all accrued and unpaid interest are paid or duly provided for.

Interest Payment Dates: June 1 and December 1 of each year, commencing on [*date*].

Regular Record Dates: May 15 and November 15.

Additional provisions of this Note are set forth on the other side of this Note.

[***The Remainder of This Page Intentionally Left Blank; Signature Page Follows***]

IN WITNESS WHEREOF, Biora Therapeutics, Inc. has caused this instrument to be duly executed as of the date set forth below.

BIORA THERAPEUTICS, INC.

Date: _____ By: ____

Name:
Title:

TRUSTEE'S CERTIFICATE OF AUTHENTICATION

GLAS Trust Company LLC, as Trustee, certifies that this is one of the Notes referred to in the within-mentioned Indenture.

Date: _____ By: ____
Authorized Signatory

BIORA THERAPEUTICS, INC.

11.00% / 13.00% Convertible Senior Secured Note due 2028

This Note is one of a duly authorized issue of notes of Biora Therapeutics, Inc., a Delaware corporation (the "**Company**"), designated as its 11.00% / 13.00% Convertible Senior Secured Notes due 2028 (the "**Notes**"), all issued or to be issued pursuant to an indenture, dated as of December 19, 2023 (as the same may be amended from time to time, the "**Indenture**"), among the Company, GLAS Trust Company LLC, as trustee and as collateral trustee, and the Guarantors. Capitalized terms used in this Note without definition have the respective meanings ascribed to them in the Indenture.

The Indenture sets forth the rights and obligations of the Company, the Trustee, the Collateral Agent and the Holders and the terms of the Notes. Notwithstanding anything to the contrary in this Note, to the extent that any provision of this Note conflicts with the provisions of the Indenture, the provisions of the Indenture will control.

1. **Interest**. This Note will accrue interest at a rate and in the manner set forth in Section 2.05 of the Indenture. Interest on this Note will begin to accrue from, and including, [*date*].

2. **Maturity**. This Note will mature on the Maturity Date, unless earlier repurchased, redeemed or converted.

3. **Method of Payment**. Cash amounts due on this Note will be paid in the manner set forth in Section 2.04 of the Indenture.

4. **Persons Deemed Owners**. The Holder of this Note will be treated as the owner of this Note for all purposes.

5. **Denominations; Transfers and Exchanges**. All Notes will be in registered form, without coupons, in principal amounts equal to any Authorized Denominations. Subject to the terms of the Indenture, the Holder of this Note may transfer or exchange this Note by presenting it to the Registrar and delivering any required documentation or other materials.

6. **Right of Holders to Require the Company to Repurchase Notes upon a Fundamental Change**. If a Fundamental Change occurs, then each Holder will have the right to require the Company to repurchase such Holder's Notes (or any portion thereof in an Authorized Denomination) for cash in the manner, and subject to the terms, set forth in Section 4.02 of the Indenture.

7. **Right of the Company to Redeem the Notes**. The Company will have the right to redeem the Notes for cash in the manner, and subject to the terms, set forth in Section 4.03 of the Indenture.

8. **Conversion**. The Holder of this Note may convert this Note into Conversion Consideration in the manner, and subject to the terms, set forth in Article 5 of the Indenture.

9. **When the Company May Merge, Etc**. Article 6 of the Indenture places limited restrictions on the Company's ability to be a party to a Business Combination Event.

10. **Defaults and Remedies**. If an Event of Default occurs, then the principal amount of, and all accrued and unpaid interest, and the Applicable Premium, on, all of the Notes then outstanding may (and, in certain circumstances, will automatically) become due and payable in the manner, and subject to the terms, set forth in Article 7 of the Indenture.

11. **Amendments, Supplements and Waivers**. The Company and the Trustee may amend or supplement the Indenture or the Notes or waive compliance with any provision of the Indenture or the Notes in the manner, and subject to the terms, set forth in Section 7.05 and Article 8 of the Indenture.

12. **No Personal Liability of Directors, Officers, Employees and Stockholders**. No past, present or future director, officer, employee, incorporator or stockholder of the Company, as such, will have any liability for any obligations of the Company under the Indenture or the Notes or for any claim based on, in respect of, or by reason of, such obligations or their creation. By accepting any Note, each Holder waives and releases all such liability. Such waiver and release are part of the consideration for the issuance of the Notes.

13. **Authentication**. No Note will be valid until it is authenticated by the Trustee. A Note will be deemed to be duly authenticated only when an authorized signatory of the Trustee (or a duly appointed authenticating agent) manually or electronically signs the certificate of authentication of such Note.

14. **Abbreviations**. Customary abbreviations may be used in the name of a Holder or its assignee, such as TEN COM (tenants in common), TEN ENT (tenants by the entireties), JT TEN (joint tenants with right of survivorship and not as tenants in common), CUST (custodian), and U/G/M/A (Uniform Gift to Minors Act).

15. **Governing Law**. THIS NOTE, AND ANY CLAIM, CONTROVERSY OR DISPUTE ARISING UNDER OR RELATED TO THIS NOTE, WILL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK.

* * *

To request a copy of the Indenture, which the Company will provide to any Holder at no charge, please send a written request to the following address:

Biora Therapeutics, Inc.
4330 La Jolla Village Drive
Suite 200
San Diego, California 92122
Attention: Chief Financial Officer

SCHEDULE OF EXCHANGES OF INTERESTS IN THE GLOBAL NOTE

INITIAL PRINCIPAL AMOUNT OF THIS GLOBAL NOTE: $[___]

The following exchanges, transfers or cancellations of this Global Note have been made:

Date	Amount of Increase (Decrease) in Principal Amount of this Global Note	Principal Amount of this Global Note After Such Increase (Decrease)	Signature of Authorized Signatory of Trustee

CONVERSION NOTICE

BIORA THERAPEUTICS, INC.

11.00% / 13.00% Convertible Senior Secured Notes due 2028

Subject to the terms of the Indenture, by executing and delivering this Conversion Notice, the undersigned Holder of the Note identified below directs the Company to convert (check one):

☐ the entire principal amount of

☐ $_____ aggregate principal amount of

the Note identified by CUSIP No. _____ and Certificate No. _____.

Date: _____ _____

(Legal Name of Holder)

By: _____

Name:

Title:

Signature Guaranteed:

_____

Participant in a Recognized Signature Guarantee Medallion Program

By: _____

Authorized Signatory

FUNDAMENTAL CHANGE REPURCHASE NOTICE

BIORA THERAPEUTICS, INC.

11.00% / 13.00% Convertible Senior Secured Notes due 2028

Subject to the terms of the Indenture, by executing and delivering this Fundamental Change Repurchase Notice, the undersigned Holder of the Note identified below is exercising its Fundamental Change Repurchase Right with respect to (check one):

☐ the entire principal amount of

☐ $_____ aggregate principal amount of

the Note identified by CUSIP No. _____ and Certificate No. _____.

The undersigned acknowledges that this Note, duly endorsed for transfer, must be delivered to the Paying Agent before the Fundamental Change Repurchase Price will be paid.

Date: _____ _____

(Legal Name of Holder)

By: ____

Name:

Title:

Signature Guaranteed:

_____

Participant in a Recognized Signature Guarantee Medallion Program

By: ____

Authorized Signatory

ASSIGNMENT FORM

BIORA THERAPEUTICS, INC.

11.00% / 13.00% Convertible Senior Secured Notes due 2028

Subject to the terms of the Indenture, the undersigned Holder of the Notes identified below assigns (check one):

☐ the entire principal amount of

☐ $_____ aggregate principal amount of

the Notes identified by CUSIP No. _____ and Certificate No. _____, and all rights thereunder, to:

Name: _____

Address: _____

Social security or tax identification #: _____

and irrevocably appoints: _____

as agent to transfer the within Note on the books of the Company. The agent may substitute another to act for him/her.

Date: _____ _____

(Legal Name of Holder)

By: ____
Name:
Title:

Signature Guaranteed:

_____

Participant in a Recognized Signature Guarantee Medallion Program

By: ____

Authorized Signatory

TRANSFEROR ACKNOWLEDGMENT

If the within Note bears a Restricted Note Legend, the undersigned further certifies that (check one):

1. ☐ Such Transfer is being made to the Company or a Subsidiary of the Company.

2. ☐ Such Transfer is being made pursuant to, and in accordance with, a registration statement that is effective under the Securities Act at the time of the Transfer.

3. ☐ Such Transfer is being made pursuant to, and in accordance with, Rule 144A under the Securities Act, and, accordingly, the undersigned further certifies that the within Note is being transferred to a Person that the undersigned reasonably believes is purchasing the within Note for its own account, or for one or more accounts with respect to which such Person exercises sole investment discretion, and such Person and each such account is a "qualified institutional buyer" within the meaning of Rule 144A under the Securities Act in a transaction meeting the requirements of Rule 144A. **If this item is checked, then the transferee must complete and execute the acknowledgment contained on the next page**.

4. ☐ Such Transfer is being made pursuant to, and in accordance with, any other available exemption from the registration requirements of the Securities Act (including, if available, the exemption provided by Rule 144 under the Securities Act).

Dated: ____

____
(Legal Name of Holder)

By: ____
Name:
Title:

Signature Guaranteed:

____
(Participant in a Recognized Signature
Guarantee Medallion Program)

By: ____
Authorized Signatory

TRANSFEREE ACKNOWLEDGMENT

The undersigned represents that it is purchasing the within Note for its own account, or for one or more accounts with respect to which the undersigned exercises sole investment discretion, and that and the undersigned and each such account is a "qualified institutional buyer" within the meaning of Rule 144A under the Securities Act. The undersigned acknowledges that the transferor is relying, in transferring the within Note on the exemption from the registration and prospectus-delivery requirements of the Securities Act of 1933, as amended, provided by Rule 144A and that the undersigned has received such information regarding the Company as the undersigned has requested pursuant to Rule 144A.

Dated: ____

____
(Name of Transferee)

By: ____
Name:
Title:

EXHIBIT B-1A

FORM OF RESTRICTED NOTE LEGEND
(Notes other than Affiliate Notes)

THE OFFER AND SALE OF THIS NOTE AND THE SHARES OF COMMON STOCK ISSUABLE UPON CONVERSION OF THIS NOTE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), AND THIS NOTE MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED EXCEPT IN ACCORDANCE WITH THE FOLLOWING SENTENCE. BY ITS ACQUISITION HEREOF OR OF A BENEFICIAL INTEREST HEREIN, THE ACQUIRER:

(1) REPRESENTS THAT IT AND ANY ACCOUNT FOR WHICH IT IS ACTING IS A "QUALIFIED INSTITUTIONAL BUYER" (WITHIN THE MEANING OF RULE 144A UNDER THE SECURITIES ACT) AND THAT IT EXERCISES SOLE INVESTMENT DISCRETION WITH RESPECT TO EACH SUCH ACCOUNT; AND

(2) AGREES FOR THE BENEFIT OF THE COMPANY THAT IT WILL NOT OFFER, SELL OR OTHERWISE TRANSFER THIS NOTE OR ANY BENEFICIAL INTEREST HEREIN, EXCEPT ONLY:

(A) TO THE COMPANY OR ANY SUBSIDIARY THEREOF;

(B) PURSUANT TO A REGISTRATION STATEMENT THAT IS EFFECTIVE UNDER THE SECURITIES ACT;

(C) TO A QUALIFIED INSTITUTIONAL BUYER IN COMPLIANCE WITH RULE 144A UNDER THE SECURITIES ACT;

(D) PURSUANT TO RULE 144 UNDER THE SECURITIES ACT; OR

(E) PURSUANT TO ANY OTHER EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT.

BEFORE THE REGISTRATION OF ANY SALE OR TRANSFER IN ACCORDANCE WITH (2)(C), (D) OR (E) ABOVE, THE COMPANY, THE TRUSTEE AND THE REGISTRAR RESERVE THE RIGHT TO REQUIRE THE DELIVERY OF SUCH CERTIFICATES OR OTHER DOCUMENTATION OR EVIDENCE AS THEY MAY REASONABLY REQUIRE IN ORDER TO DETERMINE THAT THE PROPOSED SALE OR TRANSFER IS BEING MADE IN COMPLIANCE WITH THE SECURITIES ACT AND APPLICABLE STATE SECURITIES LAWS.

EXHIBIT B-1B

FORM OF RESTRICTED NOTE LEGEND
(Affiliate Notes)

THE OFFER AND SALE OF THIS NOTE AND THE SHARES OF COMMON STOCK ISSUABLE UPON CONVERSION OF THIS NOTE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), AND THIS NOTE MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED EXCEPT IN ACCORDANCE WITH THE FOLLOWING SENTENCE. BY ITS ACQUISITION HEREOF OR OF A BENEFICIAL INTEREST HEREIN, THE ACQUIRER AGREES FOR THE BENEFIT OF THE COMPANY THAT IT WILL NOT OFFER, SELL OR OTHERWISE TRANSFER THIS NOTE OR ANY BENEFICIAL INTEREST HEREIN, EXCEPT ONLY:

(A) TO THE COMPANY OR ANY SUBSIDIARY THEREOF;

(B) PURSUANT TO A REGISTRATION STATEMENT THAT IS EFFECTIVE UNDER THE SECURITIES ACT;

(C) TO A QUALIFIED INSTITUTIONAL BUYER IN COMPLIANCE WITH RULE 144A UNDER THE SECURITIES ACT;

(D) PURSUANT TO RULE 144 UNDER THE SECURITIES ACT; OR

(E) PURSUANT TO ANY OTHER EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT.

BEFORE THE REGISTRATION OF ANY SALE OR TRANSFER IN ACCORDANCE WITH (C), (D) OR (E) ABOVE, THE COMPANY, THE TRUSTEE AND THE REGISTRAR RESERVE THE RIGHT TO REQUIRE THE DELIVERY OF SUCH CERTIFICATES OR OTHER DOCUMENTATION OR EVIDENCE AS THEY MAY REASONABLY REQUIRE IN ORDER TO DETERMINE THAT THE PROPOSED SALE OR TRANSFER IS BEING MADE IN COMPLIANCE WITH THE SECURITIES ACT AND APPLICABLE STATE SECURITIES LAWS.

EXHIBIT B-2

FORM OF GLOBAL NOTE LEGEND

THIS IS A GLOBAL NOTE WITHIN THE MEANING OF THE INDENTURE HEREINAFTER REFERRED TO AND IS REGISTERED IN THE NAME OF THE DEPOSITARY OR A NOMINEE OF THE DEPOSITARY, WHICH MAY BE TREATED BY THE COMPANY, THE TRUSTEE AND ANY AGENT THEREOF AS THE OWNER AND HOLDER OF THIS NOTE FOR ALL PURPOSES.

UNLESS THIS CERTIFICATE IS PRESENTED BY AN AUTHORIZED REPRESENTATIVE OF THE DEPOSITORY TRUST COMPANY ("DTC") TO THE COMPANY OR ITS AGENT FOR REGISTRATION OF TRANSFER, EXCHANGE OR PAYMENT, AND ANY CERTIFICATE ISSUED IS REGISTERED IN THE NAME OF CEDE & CO. OR IN SUCH OTHER NAME AS IS REQUESTED BY AN AUTHORIZED REPRESENTATIVE OF DTC (AND ANY PAYMENT HEREON IS MADE TO CEDE & CO. OR TO SUCH OTHER ENTITY AS IS REQUESTED BY AN AUTHORIZED REPRESENTATIVE OF DTC), ANY TRANSFER, PLEDGE OR OTHER USE HEREOF FOR VALUE OR OTHERWISE BY OR TO ANY PERSON IS WRONGFUL SINCE THE REGISTERED OWNER HEREOF, CEDE & CO., HAS AN INTEREST HEREIN.

TRANSFERS OF THIS GLOBAL NOTE WILL BE LIMITED TO TRANSFERS IN WHOLE, BUT NOT IN PART, TO NOMINEES OF DTC, OR TO A SUCCESSOR THEREOF OR SUCH SUCCESSOR'S NOMINEE, AND TRANSFERS OF PORTIONS OF THIS GLOBAL NOTE WILL BE LIMITED TO TRANSFERS MADE IN ACCORDANCE WITH THE RESTRICTIONS SET FORTH IN ARTICLE 2 OF THE INDENTURE HEREINAFTER REFERRED TO.

EXHIBIT B-3

FORM OF NON-AFFILIATE LEGEND

NO AFFILIATE (AS DEFINED IN RULE 144 UNDER THE SECURITIES ACT OF 1933, AS AMENDED) OF THE COMPANY MAY PURCHASE OR OTHERWISE ACQUIRE THIS NOTE OR ANY BENEFICIAL INTEREST HEREIN.

EXHIBIT C

FORM OF SUPPLEMENTAL INDENTURE

SUPPLEMENTAL INDENTURE (this "*Supplemental Indenture*"), dated as of _____, among _____ (the "*New Guarantor*"), Biora Therapeutics, Inc., a Delaware corporation, as issuer (the "*Company*"), the Guarantors party hereto from time to time (as defined herein), and GLAS Trust Company LLC, as trustee (in such capacity, the "*Trustee*") and as collateral agent (in such capacity, the "*Collateral Agent*").

W I T N E S S E T H

WHEREAS, the Company has heretofore executed and delivered to the Trustee and the Collateral Agent an indenture (the "*Indenture*"), dated as of December 19, 2023 providing for the issuance of 11.00% / 13.00 % Convertible Senior Secured Notes due 2028 (the "*Notes*");

WHEREAS, the Indenture provides that under certain circumstances the New Guarantor shall execute and deliver to the Trustee and the Collateral Agent a supplemental indenture pursuant to which the New Guarantor shall unconditionally guarantee all of the Company's Obligations under the Notes and the Indenture on the terms and conditions set forth herein (the "*Guarantee*");

WHEREAS, the New Guarantor has duly authorized the execution and delivery of this Supplemental Indenture to provide its Guarantee in accordance with Article 10 of the Indenture and all things necessary to make this Supplemental Indenture and the Indenture a valid agreement of the New Guarantor, in accordance with the terms thereof, have been done; and

WHEREAS, pursuant to Section 8.01 of the Indenture, the Trustee and Collateral Agent are authorized to execute and deliver this Supplemental Indenture.

NOW, THEREFORE, in consideration of the foregoing and for other good and valuable consideration, the receipt of which is hereby acknowledged, the Issuers, the New Guarantor, the Trustee and the Collateral Agent mutually covenant and agree for the benefit of each other and the equal and ratable benefit of the Holders of the Notes as follows:

1. CAPITALIZED TERMS. Capitalized terms used herein without definition shall have the meanings assigned to them in the Indenture.

2. AGREEMENT TO GUARANTEE. The New Guarantor hereby agrees to provide an unconditional Guarantee on the terms and subject to the conditions set forth in the Guarantee and in the Indenture including but not limited to Article 13 thereof.

4. NO RECOURSE AGAINST OTHERS. No past, present or future director, officer, employee, agent, manager, partner, member, incorporator, shareholder or unitholder of the Company or any Guarantor, as such, will have any liability for any obligations of the Issuers or the Guarantors under the Notes, this Indenture, the Guarantees or for any claim based on, in respect of, or by reason of, such obligations or their creation. Each Holder of Notes by accepting a Note waives and releases all such liability. The waiver and release are part of the consideration for issuance of the Notes.

5. NEW YORK LAW TO GOVERN. THE INTERNAL LAW OF THE STATE OF NEW YORK SHALL GOVERN AND BE USED TO CONSTRUE THIS SUPPLEMENTAL INDENTURE WITHOUT GIVING EFFECT TO APPLICABLE PRINCIPLES OF CONFLICTS OF LAW TO THE EXTENT THAT THE APPLICATION OF THE LAWS OF ANOTHER JURISDICTION WOULD BE REQUIRED THEREBY.

6. Counterparts. The parties may sign any number of copies of this Supplemental Indenture. Each signed copy will be an original, and all of them together represent the same agreement. Delivery of an executed counterpart of this Supplemental Indenture by facsimile, electronically in portable document format or in any other format will be effective as delivery of a manually executed counterpart.

7. Effect of Headings. The Section headings herein are for convenience only and shall not affect the construction hereof.

8. The Trustee and the Collateral Agent. Neither the Trustee nor the Collateral Agent shall be responsible in any manner whatsoever for or in respect of the validity or sufficiency of this Supplemental Indenture or the Guarantee or for or in respect of the recitals contained herein, all of which recitals are made solely by the New Guarantor and the Issuers**.** All of the provisions contained in the Indenture in respect of the rights, privileges, immunities, powers, and duties of the Trustee and the Collateral Agent shall be applicable in respect of this Supplemental Indenture as fully and with like force and effect as though fully set forth in full herein.

IN WITNESS WHEREOF, the parties hereto have caused this Supplemental Indenture to be duly executed and attested, all as of the date first above written.

Dated: _____,

[NEW GUARANTOR]

By_
Name:
Title:

BIORA THERAPEUTICS, INC.

By: ____
Name:
Title:

GLAS TRUST COMPANY LLC, AS TRUSTEE AND COLLATERAL AGENT

By: ____
Name:
Title:

EXHIBIT D

FORM OF PRE-FUNDED WARRANT

[See attached]

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140316350_5

NEITHER THIS SECURITY NOR THE SECURITIES FOR WHICH THIS SECURITY IS EXERCISABLE HAVE BEEN REGISTERED WITH THE SECURITIES AND EXCHANGE COMMISSION OR THE SECURITIES COMMISSION OF ANY STATE IN RELIANCE UPON AN EXEMPTION FROM REGISTRATION UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), AND, ACCORDINGLY, MAY NOT BE OFFERED OR SOLD EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OR PURSUANT TO AN AVAILABLE EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT AND IN ACCORDANCE WITH APPLICABLE STATE SECURITIES LAWS. THIS SECURITY AND THE SECURITIES ISSUABLE UPON EXERCISE OF THIS SECURITY MAY BE PLEDGED IN CONNECTION WITH A BONA FIDE MARGIN ACCOUNT OR OTHER LOAN SECURED BY SUCH SECURITIES.

COMMON STOCK PURCHASE WARRANT

BIORA THERAPEUTICS, INC.

Warrant Shares: [●] Initial Exercise Date: [●], 202[●]

THIS COMMON STOCK PURCHASE WARRANT (the "Warrant") certifies that, for value received, [●] or its assigns (the "Holder") is entitled, upon the terms and subject to the limitations on exercise and the conditions hereinafter set forth, at any time on or after the date hereof (the "Initial Exercise Date") and until the Warrant is exercised in full (the "Termination Date") but not thereafter, to subscribe for and purchase from BIORA THERAPEUTICS, INC., a Delaware corporation (the "Company"), up to [●] shares (as subject to adjustment hereunder, the "Warrant Shares") of the Company's Common Stock (as defined below). The purchase price of one share of Common Stock under this Warrant shall be equal to the Exercise Price, as defined in Section 2(b).

Section 1.Definitions. In addition to the terms defined elsewhere in this Warrant, the following terms have the meanings indicated in this Section 1:

"Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

"Bid Price" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the bid price of the Common Stock for the time in question (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. ("Bloomberg") (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on The Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of

a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

"Board of Directors" means the board of directors of the Company.

"Business Day" means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed; provided, however, for clarification, commercial banks shall not be deemed to be authorized or required by law to remain closed due to "stay at home", "shelter-in-place", "non-essential employee" or any other similar orders or restrictions or the closure of any physical branch locations at the direction of any governmental authority so long as the electronic funds transfer systems (including for wire transfers) of commercial banks in The City of New York generally are open for use by customers on such day.

"Commission" means the United States Securities and Exchange Commission.

"Common Stock" means the common stock of the Company, par value $0.001 per share, and any other class of securities into which such securities may hereafter be reclassified or changed.

"Common Stock Equivalents" means any securities of the Company or the Subsidiaries which would entitle the holder thereof to acquire at any time shares of Common Stock, including, without limitation, any debt, preferred stock, right, option, warrant or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

"Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

"Person" means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

"Subsidiary" means the subsidiaries of the Company set forth on Exhibit 21.1 to the Company's Annual Report on Form 10-K for the year ended December 31, 2022, as filed with the Commission on March 30, 2023, and shall, where applicable, also include any direct or indirect subsidiary of the Company formed or acquired after the date hereof.

"Trading Day" means a day on which the Common Stock is traded on a Trading Market.

"Trading Market" means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market or the New York Stock Exchange (or any successors to any of the foregoing).

"Transfer Agent" means American Stock Transfer and Trust Company, LLC, the current transfer agent of the Company, with a mailing address of 6201 15th Ave, Brooklyn, NY 11219, and any successor transfer agent of the Company.

"VWAP" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on The Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

Section 2.Exercise.

a) Exercise of Warrant. Exercise of the purchase rights represented by this Warrant may be made, in whole or in part, at any time or times on or after the Initial Exercise Date and on or before the Termination Date by delivery to the Company of a duly executed facsimile copy or PDF copy submitted by e-mail (or e-mail attachment) of the Notice of Exercise in the form annexed hereto (the "Notice of Exercise"). Within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined in Section 2(d)(i) herein) following the date of exercise as aforesaid, the Holder shall deliver the aggregate Exercise Price for the Warrant Shares specified in the applicable Notice of Exercise by wire transfer or cashier's check drawn on a United States bank unless the cashless exercise procedure specified in Section 2(c) is specified in the applicable Notice of Exercise. No ink-original Notice of Exercise shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Exercise be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company until the Holder has purchased all of the Warrant Shares available hereunder and the Warrant has been exercised in full, in which case, the Holder shall surrender this Warrant to the Company for cancellation within three (3) Trading Days of the date on which the final Notice of Exercise is delivered to the Company. Partial exercises of this Warrant resulting in purchases of a portion of the total number of Warrant Shares available hereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable hereunder in an amount equal to the applicable number of Warrant Shares purchased. The Holder and the Company shall maintain records showing the number of Warrant Shares purchased and the date of such purchases. The Company shall deliver any objection to any Notice of Exercise within one (1) Trading Day of receipt of such notice. **The Holder and any assignee, by acceptance of this Warrant, acknowledge and agree that, by reason of the provisions of this paragraph, following the purchase of a**

portion of the Warrant Shares hereunder, the number of Warrant Shares available for purchase hereunder at any given time may be less than the amount stated on the face hereof.

b) Exercise Price. The exercise price per share of Common Stock under this Warrant shall be $0.001, subject to adjustment hereunder. (the "Exercise Price").

c) Cashless Exercise. This Warrant may also be exercised, in whole or in part, at such time by means of a "cashless exercise" in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing [(A-B) (X)] by (A), where:

(A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 2(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 2(a) hereof on a Trading Day prior to the opening of "regular trading hours" (as defined in Rule 600(b) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Stock on the principal Trading Market as reported by Bloomberg as of the time of the Holder's execution of the applicable Notice of Exercise if such Notice of Exercise is executed during "regular trading hours" on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of "regular trading hours" on a Trading Day) pursuant to Section 2(a) hereof or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 2(a) hereof after the close of "regular trading hours" on such Trading Day;

(B) = the Exercise Price of this Warrant, as adjusted hereunder; and

(X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the holding period of the Warrant Shares being issued may be tacked on to the holding period of the Warrant. The Company agrees not to take any position contrary to this Section 2(c).

d) Mechanics of Exercise.

i. Delivery of Warrant Shares Upon Exercise. The Company shall cause the Warrant Shares purchased hereunder to be transmitted by the Transfer Agent to the Holder by crediting the account of the Holder's or its designee's balance account with The Depository Trust Company through its Deposit or Withdrawal at Custodian system

("DWAC") if the Company is then a participant in such system and either (A) there is an effective registration statement permitting the issuance of the Warrant Shares to or resale of the Warrant Shares by the Holder or (B) the Warrant Shares are eligible for resale by the Holder without volume or manner-of-sale limitations pursuant to Rule 144 (assuming cashless exercise of the Warrants), and otherwise by physical delivery of a certificate, registered in the Company's share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the address specified by the Holder in the Notice of Exercise by the date that is the earlier of (A) the earlier of (i) two (2) Trading Days and (ii) the number of days comprising the Standard Settlement Period, in each case after the delivery to the Company of the Notice of Exercise and (B) one (1) Trading Day after delivery of the aggregate Exercise Price to the Company (such date, the "Warrant Share Delivery Date"). Upon delivery of the Notice of Exercise, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date of delivery of the Warrant Shares, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received by the Warrant Share Delivery Date. If the Company fails for any reason to deliver to the Holder the Warrant Shares subject to a Notice of Exercise by the Warrant Share Delivery Date, the Company shall pay to the Holder, in cash, as liquidated damages and not as a penalty, for each $1,000 of Warrant Shares subject to such exercise (based on the VWAP of the Common Stock on the date of the applicable Notice of Exercise), $10 per Trading Day (increasing to $20 per Trading Day on the fifth Trading Day after the Warrant Share Delivery Date) for each Trading Day after such Warrant Share Delivery Date until such Warrant Shares are delivered or Holder rescinds such exercise. The Company agrees to maintain a transfer agent that is a participant in the FAST program so long as this Warrant remains outstanding and exercisable. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Company's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Exercise.

ii. Delivery of New Warrants Upon Exercise. If this Warrant shall have been exercised in part, the Company shall, at the request of a Holder and upon surrender of this Warrant certificate, at the time of delivery of the Warrant Shares, deliver to the Holder a new Warrant evidencing the rights of the Holder to purchase the unpurchased Warrant Shares called for by this Warrant, which new Warrant shall in all other respects be identical with this Warrant.

iii. Rescission Rights. If the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares on a timely basis pursuant to Section 2(d)(i) by the Warrant Share Delivery Date, then the Holder will have the right to rescind such exercise.

iv. Compensation for Buy-In on Failure to Timely Deliver Warrant Shares Upon Exercise. In addition to any other rights available to the Holder, if the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares in accordance with the provisions of Section 2(d)(i) above pursuant to an exercise on or before the Warrant Share Delivery Date (other than any such failure that is solely due to

any action by the Holder with respect to such exercise), and if after such date the Holder is required by its broker to purchase (in an open market transaction or otherwise) or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by the Holder of the Warrant Shares which the Holder anticipated receiving upon such exercise (a "Buy-In"), then the Company shall (A) pay in cash to the Holder the amount, if any, by which (x) the Holder's total purchase price (including brokerage commissions, if any) for the shares of Common Stock so purchased exceeds (y) the amount obtained by multiplying (1) the number of Warrant Shares that the Company was required to deliver to the Holder in connection with the exercise at issue times (2) the price at which the sell order giving rise to such purchase obligation was executed, and (B) at the option of the Holder, either reinstate the portion of the Warrant and equivalent number of Warrant Shares for which such exercise was not honored (in which case such exercise shall be deemed rescinded) or deliver to the Holder the number of shares of Common Stock that would have been issued had the Company timely complied with its exercise and delivery obligations hereunder. For example, if the Holder purchases Common Stock having a total purchase price of $11,000 to cover a Buy-In with respect to an attempted exercise of shares of Common Stock with an aggregate sale price giving rise to such purchase obligation of $10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder $1,000. The Holder shall provide the Company written notice indicating the amounts payable to the Holder in respect of the Buy-In and, upon request of the Company, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver shares of Common Stock upon exercise of the Warrant as required pursuant to the terms hereof.

v. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such exercise, the Company shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Exercise Price or round up to the next whole share.

vi. Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the Holder for any issue or transfer tax or other incidental expense in respect of the issuance of such Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the Holder or in such name or names as may be directed by the Holder; provided, however, that, in the event that Warrant Shares are to be issued in a name other than the name of the Holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto duly executed by the Holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall pay all Transfer Agent fees required for same-day processing of any Notice of Exercise and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Warrant Shares.

vii. Closing of Books. The Company will not close its stockholder books or records in any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

e) Holder's Exercise Limitations. The Company shall not effect any exercise of this Warrant, and a Holder shall not have the right to exercise any portion of this Warrant, pursuant to Section 2 to the extent that after giving effect to such issuance after exercise as set forth on the applicable Notice of Exercise, the Holder (together with the Holder's Affiliates, and any other Persons acting as a group together with the Holder or any of the Holder's Affiliates (such Persons, "Attribution Parties")), would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (i) exercise of the remaining, nonexercised portion of this Warrant beneficially owned by the Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other Common Stock Equivalents) subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 2(e), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder, it being acknowledged by the Holder that the Company is not representing to the Holder that such calculation is in compliance with Section 13(d) of the Exchange Act and the Holder is solely responsible for any schedules required to be filed in accordance therewith. To avoid doubt, the calculation of the Beneficial Ownership Limitation shall take into account the concurrent exercise or conversion, as applicable, of the unexercised or unconverted portion of any other securities of the Company (including, without limitation, any other Common Stock Equivalents) beneficially owned by the Holder or any Attribution Party, as applicable. To the extent that the limitation contained in this Section 2(e) applies, the determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable shall be in the sole discretion of the Holder, and the submission of a Notice of Exercise shall be deemed to be the Holder's determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable, in each case subject to the Beneficial Ownership Limitation, and the Company shall have no obligation to verify or confirm the accuracy of such determination (including any determination as to group status pursuant to the next sentence). In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 2(e), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as reflected in (A) the Company's most recent periodic or annual report filed with the Commission, as the case may be, (B) a more recent public announcement by the Company or (C) a more recent

written notice by the Company or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Company shall within one (1) Trading Day confirm orally and in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 49.9% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon exercise of this Warrant. The Holder, upon notice to the Company, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 2(e), provided that the Beneficial Ownership Limitation in no event exceeds 49.9% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon exercise of this Warrant held by the Holder and the provisions of this Section 2(e) shall continue to apply. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 2(e) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation herein contained or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Warrant.

Section 3.Certain Adjustments.

a) Stock Dividends and Splits. If the Company, at any time while this Warrant is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions on shares of its Common Stock or any other equity or equity equivalent securities payable in shares of Common Stock (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Company upon exercise of this Warrant), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of reverse stock split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues by reclassification of shares of the Common Stock any shares of capital stock of the Company, then in each case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding treasury shares, if any) outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate Exercise Price of this Warrant shall remain unchanged. Any adjustment made pursuant to this Section 3(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 3(a), if at any time the Company grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, that to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

c) Pro Rata Distributions. During such time as this Warrant is outstanding, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, that to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

d) Fundamental Transaction. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, (ii) the Company (and all of its Subsidiaries, taken as a whole), directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or

indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock or 50% or more of the voting power of the common equity of the Company, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, merger or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires 50% or more of the outstanding shares of Common Stock or 50% or more of the voting power of the common equity of the Company (each a "Fundamental Transaction"), then, upon any subsequent exercise of this Warrant, the Holder shall have the right to receive, for each Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction, at the option of the Holder (without regard to any limitation in Section 2(e) on the exercise of this Warrant), the number of shares of Common Stock of the successor or acquiring corporation or of the Company, if it is the surviving corporation, and any additional consideration (the "Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Warrant is exercisable immediately prior to such Fundamental Transaction (without regard to any limitation in Section 2(e) on the exercise of this Warrant). For purposes of any such exercise, the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon any exercise of this Warrant following such Fundamental Transaction. Notwithstanding anything to the contrary, in the event of a Fundamental Transaction, the Company or any Successor Entity (as defined below) shall, at the Holder's option, exercisable at any time concurrently with, or within 30 days after, the consummation of the Fundamental Transaction (or, if later, the date of the public announcement of the applicable Fundamental Transaction), purchase this Warrant from the Holder by paying to the Holder an amount of cash equal to the Black Scholes Value (as defined below) of the remaining unexercised portion of this Warrant on the date of the consummation of such Fundamental Transaction; provided, however, that, if the Fundamental Transaction is not within the Company's control, including not approved by the Company's Board of Directors, Holder shall only be entitled to receive from the Company or any Successor Entity the same type or form of consideration (and in the same proportion), at the Black Scholes Value of the unexercised portion of this Warrant, that is being offered and paid to the holders of Common Stock of the Company in connection with the Fundamental Transaction, whether that consideration

be in the form of cash, stock or any combination thereof, or whether the holders of Common Stock are given the choice to receive from among alternative forms of consideration in connection with the Fundamental Transaction; provided, further, that if holders of Common Stock of the Company are not offered or paid any consideration in such Fundamental Transaction, such holders of Common Stock will be deemed to have received common stock of the Successor Entity (which Entity may be the Company following such Fundamental Transaction) in such Fundamental Transaction. "Black Scholes Value" means the value of this Warrant based on the Black Scholes Option Pricing Model obtained from the "OV" function on Bloomberg determined as of the day of consummation of the applicable Fundamental Transaction for pricing purposes and reflecting (A) a risk-free interest rate corresponding to the U.S. Treasury rate for a period equal to the time between the date of the public announcement of the applicable contemplated Fundamental Transaction and the Termination Date, (B) an expected volatility equal to the greater of 100% and the 100 day volatility obtained from the HVT function on Bloomberg (determined utilizing a 365-day annualization factor) as of the Trading Day immediately following the public announcement of the applicable contemplated Fundamental Transaction, (C) the underlying price per share used in such calculation shall be the greater of (i) the sum of the price per share being offered in cash, if any, plus the value of any non-cash consideration, if any, being offered in such Fundamental Transaction and (ii) the highest VWAP during the period beginning on the Trading Day immediately preceding the announcement of the applicable contemplated Fundamental Transaction (or the consummation of the applicable Fundamental Transaction, if earlier) and ending on the Trading Day of the Holder's request pursuant to this Section 3(d) and (D) a remaining option time equal to the time between the date of the public announcement of the applicable contemplated Fundamental Transaction and the Termination Date and (E) a zero cost of borrow. The payment of the Black Scholes Value will be made by wire transfer of immediately available funds (or such other consideration) within five (5) Trading Days of the Holder's election (or, if later, on the effective date of the Fundamental Transaction). The Company shall cause any successor entity in a Fundamental Transaction in which the Company is not the survivor (the "Successor Entity") to assume in writing all of the obligations of the Company under this Warrant and the other Transaction Documents in accordance with the provisions of this Section 3(d) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the Holder, deliver to the Holder in exchange for this Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant which is exercisable for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in

form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Warrant and the other Transaction Documents referring to the "Company" shall refer instead to the Successor Entity), and may exercise every right and power of the Company and shall assume all of the obligations of the Company under this Warrant and the other Transaction Documents with the same effect as if such Successor Entity had been named as the Company herein.

e) Calculations. All calculations under this Section 3 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 3, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding treasury shares, if any) issued and outstanding.

f)Notice to Holder.

i. Adjustment to Exercise Price. Whenever the Exercise Price is adjusted pursuant to any provision of this Section 3, the Company shall promptly deliver to the Holder by facsimile or email a notice setting forth the Exercise Price after such adjustment and any resulting adjustment to the number of Warrant Shares and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Exercise by Holder. If (A) the Company shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Company shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Company shall authorize the granting to all holders of the Common Stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Company shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Company is a party, any sale or transfer of all or substantially all of the assets of the Company, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property, or (E) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company, then, in each case, the Company shall cause to be delivered by facsimile or email to the Holder at its last facsimile number or email address as it shall appear upon the Warrant Register of the Company, at least 20 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange; provided that the failure to deliver such notice or

any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided in this Warrant constitutes, or contains, material, non-public information regarding the Company or any of the Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to exercise this Warrant during the period commencing on the date of such notice to the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

Section 4. Transfer of Warrant.

a) Transferability. Subject to compliance with any applicable securities laws, this Warrant and all rights hereunder are transferable, in whole or in part, upon surrender of this Warrant at the principal office of the Company or its designated agent, together with (i) a written assignment of this Warrant substantially in the form attached hereto duly executed by the Holder or its agent or attorney, (ii) at the request of the Company, of an opinion of counsel reasonably satisfactory to the Company to the effect that the transfer of such portion of this Warrant may be made pursuant to an available exemption from the registration requirements of the Securities Act and (iii) funds sufficient to pay any transfer taxes payable upon the making of such transfer. Upon such surrender and, if required, such payment, the Company shall execute and deliver a new Warrant or Warrants in the name of the assignee or assignees, as applicable, and in the denomination or denominations specified in such instrument of assignment, and shall issue to the assignor a new Warrant evidencing the portion of this Warrant not so assigned, and this Warrant shall promptly be cancelled. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company unless the Holder has assigned this Warrant in full, in which case, the Holder shall surrender this Warrant to the Company within three (3) Trading Days of the date on which the Holder delivers an assignment form to the Company assigning this Warrant in full. The Warrant, if properly assigned in accordance herewith, may be exercised by a new holder for the purchase of Warrant Shares without having a new Warrant issued.

b) New Warrants. This Warrant may be divided or combined with other Warrants upon presentation hereof at the aforesaid office of the Company, together with a written notice specifying the names and denominations in which new Warrants are to be issued, signed by the Holder or its agent or attorney. Subject to compliance with Section 4(a), as to any transfer which may be involved in such division or combination, the Company shall execute and deliver a new Warrant or Warrants in exchange for the Warrant or Warrants to be divided or combined in accordance with such notice. All Warrants issued on transfers or exchanges shall be dated the Issue Date of this Warrant and shall be identical with this Warrant except as to the number of Warrant Shares issuable pursuant thereto.

c) Warrant Register. The Company shall register this Warrant, upon records to be maintained by the Company for that purpose (the "Warrant Register"), in the name of the record Holder hereof from time to time. The Company may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any

exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

d) Reserved.

e) Representation by the Holder. The Holder, by the acceptance hereof, represents and warrants that it is acquiring this Warrant and, upon any exercise hereof, will acquire the Warrant Shares issuable upon such exercise, for its own account and not with a view to or for distributing or reselling such Warrant Shares or any part thereof in violation of the Securities Act or any applicable state securities law, except pursuant to sales registered or exempted under the Securities Act.

Section 5. Miscellaneous.

a) No Rights as Stockholder Until Exercise; No Settlement in Cash. This Warrant does not entitle the Holder to any voting rights, dividends or other rights as a stockholder of the Company prior to the exercise hereof as set forth in Section 2(d)(i), except as expressly set forth in Section 3. Without limiting the rights of a Holder to receive Warrant Shares on a "cashless exercise," and to receive the cash payments contemplated pursuant to Sections 2(d)(i) and 2(d)(iv), in no event will the Company be required to net cash settle an exercise of this Warrant.

b) Loss, Theft, Destruction or Mutilation of Warrant. The Company covenants that upon receipt by the Company of evidence reasonably satisfactory to it of the loss, theft, destruction or mutilation of this Warrant or any stock certificate relating to the Warrant Shares, and in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to it, and upon surrender and cancellation of such Warrant or stock certificate, if mutilated, the Company will make and deliver a new Warrant or stock certificate of like tenor and dated as of such cancellation, in lieu of such Warrant or stock certificate.

c) Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Trading Day, then, such action may be taken or such right may be exercised on the next succeeding Trading Day.

d) Authorized Shares. The Company covenants that, during the period the Warrant is outstanding, it will reserve from its authorized and unissued Common Stock a sufficient number of shares to provide for the issuance of the Warrant Shares upon the exercise of any purchase rights under this Warrant. The Company further covenants that its issuance of this Warrant shall constitute full authority to its officers who are charged with the duty of issuing the necessary Warrant Shares upon the exercise of the purchase rights under this Warrant. The Company will take all such reasonable action as may be necessary to assure that such Warrant Shares may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of the Trading Market upon which the Common Stock may be listed. The Company covenants that all Warrant Shares which may be issued upon the exercise of the purchase rights represented by this Warrant will, upon exercise of the purchase rights represented by this Warrant and payment for such Warrant Shares in accordance herewith, be duly authorized, validly issued, fully paid and nonassessable and free from all taxes, liens and charges

created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue).

Except and to the extent as waived or consented to by the Holder, the Company shall not by any action, including, without limitation, amending its certificate of incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such actions as may be necessary or appropriate to protect the rights of Holder as set forth in this Warrant against impairment. Without limiting the generality of the foregoing, the Company will (i) not increase the par value of any Warrant Shares above the amount payable therefor upon such exercise immediately prior to such increase in par value, (ii) take all such action as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable Warrant Shares upon the exercise of this Warrant, (iii) use commercially reasonable efforts to obtain all such authorizations, exemptions or consents from any public regulatory body having jurisdiction thereof, as may be, necessary to enable the Company to perform its obligations under this Warrant and (iv) not take any action that would result in the Exercise Price of this Warrant being in excess of the then-applicable par value of any Warrant Shares.

Before taking any action which would result in an adjustment in the number of Warrant Shares for which this Warrant is exercisable or in the Exercise Price, the Company shall obtain all such authorizations or exemptions thereof, or consents thereto, as may be necessary from any public regulatory body or bodies having jurisdiction thereof.

e) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party agrees that all legal proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Warrant (whether brought against a party hereto or their respective affiliates, directors, officers, shareholders, partners, members, employees or agents) shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is improper or is an inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Warrant and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law. If either party shall commence an action, suit or proceeding to enforce any provisions of this Warrant, the prevailing party in such action, suit or proceeding shall be reimbursed by the other

party for their reasonable attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such action or proceeding.

f) Restrictions. The Holder acknowledges that the Warrant Shares acquired upon the exercise of this Warrant, if not registered, and the Holder does not utilize cashless exercise, will have restrictions upon resale imposed by state and federal securities laws.

g) Nonwaiver and Expenses. No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise prejudice the Holder's rights, powers or remedies, notwithstanding the fact that the right to exercise this Warrant terminates on the Termination Date. Without limiting any other provision of this Warrant, if the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

h) Notices. Any and all notices or other communications or deliveries to be provided by the holders hereunder including, without limitation, any Notice of Exercise, shall be in writing and delivered personally, by facsimile or e-mail, or sent by a nationally recognized overnight courier service, addressed to the Company, at 4330 La Jolla Village Drive, Suite 300, San Diego, CA 92122, Attention: Clarke Neumann, email address: Clarke.Neumann@bioratherapeutics.com, with a copy to legaldeptcontractnotices@bioratherapeutics.com, or such other telephone number, email address or address as the Company may specify for such purposes by notice to the Holders. Any and all notices or other communications or deliveries to be provided by the Company hereunder shall be in writing and delivered personally, by facsimile or e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the facsimile number, e-mail address or address of such Holder appearing on the books of the Company. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the time of transmission, if such notice or communication is delivered via facsimile at the facsimile number or via e-mail at the e-mail address set forth in this Section prior to 5:30 p.m. (New York City time) on any date, (ii) the next Trading Day after the time of transmission, if such notice or communication is delivered via facsimile at the facsimile number or via e-mail at the e-mail address set forth in this Section on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Company or any subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K.

i) Limitation of Liability. No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for

the purchase price of any Common Stock or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

j) Remedies. The Holder, in addition to being entitled to exercise all rights granted by law, including recovery of damages, will be entitled to specific performance of its rights under this Warrant. The Company agrees that monetary damages would not be adequate compensation for any loss incurred by reason of a breach by it of the provisions of this Warrant and hereby agrees to waive and not to assert the defense in any action for specific performance that a remedy at law would be adequate.

k) Successors and Assigns. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

l) Amendment. This Warrant may be modified or amended or the provisions hereof waived with the written consent of the Company, on the one hand, and the Holder of this Warrant, on the other hand.

m) Severability. Wherever possible, each provision of this Warrant shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Warrant shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Warrant.

n) Headings. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant.

(Signature Page Follows)

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

BIORA THERAPEUTICS, INC.

By: ____
Name:
Title:

[Signature Page to Common Stock Purchase Warrant]

NOTICE OF EXERCISE

TO: **BIORA THERAPEUTICS, INC.**

The undersigned hereby elects to purchase _____ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.

[Payment shall take the form of (check applicable box):

[ ] in lawful money of the United States; or

[ ] the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 2(c), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 2(c).]

Please issue said Warrant Shares in the name of the undersigned or in such other name as is specified below:

_____

The Warrant Shares shall be delivered to the following DWAC Account Number:

_____

_____

The undersigned represents and warrants that is an "accredited investor" as defined in Regulation D promulgated under the Securities Act of 1933, as amended.

[SIGNATURE OF HOLDER]

Name of Investing Entity: __

Signature of Authorized Signatory of Investing Entity: ____

Name of Authorized Signatory: __

Title of Authorized Signatory: ___

Date: ___

EXHIBIT B

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to exercise the Warrant to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to:

Name: ____

Address: ____

____

____

Phone Number: ____

Email Address: ____

Dated: ____

Holder's Signature: ____

Holder's Address: ____

____

____

Exhibit 4.25

SUPPLEMENTAL INDENTURE

THIS SUPPLEMENTAL INDENTURE (this "*Supplemental Indenture*"), dated as of March 12, 2024, is made by and between Biora Therapeutics, Inc., a Delaware corporation (the "*Company*") and GLAS Trust Company LLC, as trustee under the Indenture referred to below (the "*Trustee*"). Capitalized terms used herein but otherwise undefined shall have the meaning assigned to such terms in the Original Indenture (as defined below).

W I T N E S E T H:

WHEREAS, the Company, the Trustee and GLAS Trust Company LLC, as collateral agent, are parties to that certain indenture , dated as of December 19, 2023 (the "*Original Indenture*" and as amended, restated, amended and restated, supplemented or otherwise modified from time to time, the "*Indenture*"), providing for the issuance of 11.00% / 13.00% Convertible Senior Notes due 2028 (the "*Notes*");

WHEREAS, Section 8.02 of the Original Indenture provides that, with the consent of the Holders of (a) at least a majority in aggregate principal amount of the Notes then outstanding and (b) the then outstanding Notes held by Persons who are not Affiliates of the Company and its Subsidiaries (collectively, the "*Majority Consent*"), the Company and the Trustee may amend or supplement the Indenture or the Notes in accordance with such Section 8.02, except with respect to, among others, amendments to permit the Company to issue additional Notes for which the consent of the Holders of (a) at least 66 2/3% in principal amount of the Notes then outstanding and (b) at least 66 2/3% in principal amount of the then outstanding Notes held by Persons who are not Affiliates of the Company and its Subsidiaries (collectively, the "*Supermajority Consent*" and, together with the Majority Consent, the "*Requisite Consent*"), shall be required;

WHEREAS, the Holders of Notes comprising the Requisite Consent have validly tendered, and not withdrawn, their consents to the adoption of certain proposed amendments to the Original Indenture as set forth in Article I to this Supplemental Indenture (the "*Proposed Amendments*") to be effectuated by this Supplemental Indenture in accordance with the provisions of the Original Indenture, and the Company, having received the Requisite Consent for the Proposed Amendments for the Notes, desires to amend the Original Indenture as provided in this Supplemental Indenture only in respect of the Notes; and

WHEREAS, the Company has heretofore delivered or is delivering contemporaneously herewith to the Trustee the Officer's Certificate and Opinion of Counsel pursuant to Section 8.06 of the Indenture;

NOW, THEREFORE, in consideration of the foregoing and notwithstanding any provision of the Original Indenture which, absent this Supplemental Indenture, might operate to limit such action, the parties hereto, intending to be legally bound hereby, agree as follows:

ARTICLE I
AMENDMENTS

SECTION 1.01.Amendment of Provisions.

(a) New Defined Terms: Section 1.01 of the Original Indenture is hereby amended to add the following defined terms thereto in the appropriate alphabetical order:

i. "2023 Exchange Agreements" means those certain exchange agreements, dated December 18, 2023, providing for the issuance by the Company of $23,930,000 aggregate principal amount of Notes.

ii. "2023 Purchase Agreements" those certain purchase agreements, dated December 18, 2023, providing for the issuance by the Company of $16,953,000 aggregate principal amount of Notes.

iii. "2024 Exchange Agreement" means that certain exchange agreement, dated March 8, 2024, providing for the issuance by the Company of $3,825,000 aggregate principal amount of Notes.

iv. "2024 Purchase Agreement" means that certain purchase agreement, dated March 8, 2024, providing for the issuance by the Company of $2,812,500 aggregate principal amount of Notes.

(b) Amended Defined Terms: Section 1.01 of the Original Indenture is hereby amended by replacing the existing corresponding defined term with each of the below, in its entirety.

i. "Exchange Agreements" means (i) the 2023 Exchange Agreements and (ii) the 2024 Exchange Agreement.

ii. "Original Issue Date" means the date on which any Notes were originally issued.

iii. "Purchase Agreements" means (i) the 2023 Purchase Agreements and (ii) the 2024 Purchase Agreement.

(c) Other Amendments:

a. Section 2.03(B) is hereby amended and restated in its entirety with the following:

i. "(B) *Additional Notes*. The Company may not issue any additional Notes under this Indenture except (i) as explicitly contemplated in Section 2.03(C) or (ii) pursuant to Sections 2.10(B), 2.10(C), 2.11 and 2.13, or Notes issued in respect of interest in accordance with Section 2.05(D)."

b. a new clause (c) is hereby added to Section 2.03 of the Original Indenture:

(C) *2024 Notes.* On March 12, 2024 there will be originally issued $6,637,500 aggregate principal amount of Notes, subject to the provisions of the Indenture. Notes issued pursuant to this Section 2.03(C) and any Notes issued in exchange therefor or in substitution thereof, shall be considered part of the same issuance as, and will be of the same class as, the Initial Notes.

ARTICLE II
MISCELLANEOUS PROVISIONS

SECTION 2.01.Ratification and Incorporation of Indenture. The Company hereby confirms and agrees that, except as specifically supplemented hereby, the Original Indenture and the other Notes Documents are, and shall continue to be in full force and effect and are in all respects ratified and confirmed by the Company, and the Original Indenture and this Supplemental Indenture shall be read, taken and construed as one and the same instrument. The Company hereby ratifies, confirms and reaffirms its liabilities, its payment and performance obligations (contingent or otherwise) and its agreements under the Original Indenture and each other Notes Document, all as amended by this Supplemental Indenture. The Company hereby confirms and agrees that, to the extent that any such Notes Document, including, for the avoidance of doubt, the Security Agreement, purports to assign or pledge to the Trustee, for the benefit of the Secured Parties, or to grant to the Trustee, for the benefit of the Secured Parties, a security interest in or Lien on any Collateral as security for the Obligations of the Company from time to time, such pledge, assignment and/or grant of the security interest or Lien is hereby ratified and confirmed in all respects.

SECTION 2.02.Executed in Counterparts. The parties may sign any number of copies of this Supplemental Indenture. Each signed copy shall be an original, but all of them together represent the same agreement. Delivery of an executed counterpart of this Supplemental Indenture by facsimile, electronically in portable document format or in any other format will be effective as delivery of a manually executed counterpart.

SECTION 2.03.Governing Law. THIS SUPPLEMENTAL INDENTURE WILL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK.

SECTION 2.04.Waiver of Jury Trial. EACH OF THE COMPANY AND THE TRUSTEE HEREBY IRREVOCABLY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATING TO THIS SUPPLEMENTAL INDENTURE, THE ORIGINAL INDENTURE, THE NOTES OR THE TRANSACTIONS CONTEMPLATED HEREBY OR THEREBY.

SECTION 2.05.Severability. In case any provision in this Supplemental Indenture or the Notes is invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions will not in any way be affected or impaired thereby.

SECTION 2.06.Headings. The headings of the Sections of this Supplemental Indenture have been inserted for convenience of reference only, are not to be considered a part of this Supplemental Indenture and shall in no way modify or restrict any of the terms or provisions hereof.

SECTION 2.07.Requisite Consent. To the extent Requisite Consent is determined by a court of competent jurisdiction to have not been validly obtained in accordance with the Indenture or applicable laws, the Proposed Amendments shall not be deemed to have occurred.

SECTION 2.08.Trustee's Disclaimer. It is understood and agreed by the parties hereto that: (1) GLAS Trust Company LLC is entering into this Supplemental Indenture, not in its individual capacity, but solely as Trustee in conclusive reliance upon the Opinion of Counsel and Officer's Certificate delivered to it; (ii) the recitals contained herein and the statements made in any Officer's Certificate shall be taken as the statements of the Company, and the Trustee assumes no responsibility for their correctness, and none of the recitals contained herein or the statements made in any Officer's Certificate are intended to or shall be construed as statements made or agreed to by the Trustee; (iii) the Trustee makes no representations as to the validity or sufficiency of this Supplemental Indenture or the consequences of the Proposed Amendments provided herein; and (iv) for the avoidance of doubt, the Trustee shall be entitled to all of its rights, protections, immunities, and indemnities as afforded to the Trustee and the other Notes Documents as if the same were fully set forth herein.

SECTION 2.09 Notes Document. This Supplemental Indenture, is, and shall be, one of the Notes Documents.

SECTION 2.10 Amendment. This Supplemental Indenture may be amended in writing from time to time in accordance with the terms of the Indenture.

[Signature Pages Follow]

IN WITNESS WHEREOF, each party hereto has caused this Supplemental Indenture to be signed in its name and behalf by its duly authorized officer, all as of the day and year first above written.

BIORA THERAPEUTICS, INC.

By: /s/ Eric d'Esparbes
Name: Eric d'Esparbes
Title: Chief Financial Officer

[Signature Page to Supplemental Indenture]

GLAS TRUST COMPANY LLC,
as Trustee

By: /s/ Katie Fischer
Name: Katie Fischer
Title: Vice President

[Signature Page to Supplemental Indenture]

Exhibit 10.29

SECURITY AGREEMENT

among

BIORA THERAPEUTICS, INC.,
as Issuer,

THE GUARANTORS PARTY HERETO FROM TIME TO TIME,
as Guarantors

and

GLAS TRUST COMPANY LLC
as Collateral Agent

Dated as of December 19, 2023

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SECURITY AGREEMENT

This SECURITY AGREEMENT, dated as of December 19, 2023 (as amended, restated, amended and restated, supplemented or otherwise modified from time to time in accordance with the provisions hereof, including by one or more Joinder Agreements, or otherwise, this "**Agreement**"), is made by and among Biora Therapeutics, Inc., a Delaware corporation (the "**Issuer**"), and the Subsidiaries of the Issuer from time to time party hereto as guarantors (collectively, the "**Guarantors**"), as pledgors (the Issuer, together with the Guarantors, in such capacities, and together with any successors in such capacity, the "**Pledgors**" and each, a "**Pledgor**"), and GLAS Trust Company LLC, a limited liability company organized and existing under the laws of the State of New Hampshire, solely in its capacity as Collateral Agent pursuant to the Indenture, (in such capacity, and together with any successors in such capacity, the "**Collateral Agent** ").

R E C I T A L S:

A. In connection with the execution and delivery of this Agreement, the Issuer, the Guarantors, GLAS Trust Company LLC, as Trustee (as defined in the Indenture) and as Collateral Agent have entered into that certain Indenture, dated as of December 19, 2023 (as amended, restated, amended and restated, supplemented or otherwise modified from time to time, the "**Indenture**").

B. The Pledgors will receive substantial direct and/or indirect benefits from the execution and delivery of the Indenture and the other Notes Documents and are, therefore, willing to enter into this Agreement.

C. This Agreement is made by and among the Pledgors and the Collateral Agent to grant a Lien on the Pledged Collateral to the Collateral Agent for the benefit of the Secured Parties to secure the payment and performance of all of the Obligations.

D. It is a condition to the issuance of the Notes that the Issuer executes and delivers the applicable Notes Documents, including this Agreement.

A G R E E M E N T:

NOW THEREFORE, in consideration of the foregoing premises and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, each Pledgor and the Collateral Agent hereby agree as follows:

ARTICLE I

DEFINITIONS AND INTERPRETATION

SECTION 1.1Definitions. (a) Unless otherwise defined herein or in the Indenture, capitalized terms used herein that are defined in the UCC (as defined below) shall have the meanings assigned to them in the UCC.

(a) Terms used (including in the preamble and recitals hereto) but not otherwise defined herein that are defined in the Indenture shall have the meanings given to them in the Indenture.

(b) The following terms shall have the following meanings:

"**Agreement**" shall have the meaning assigned to such term in the preamble hereof.

"**CFC**" shall mean a "controlled foreign corporation" within the meaning of section 957(a) of the Code.

"**Code**" shall mean the Internal Revenue Code of 1986, as amended.

"**Collateral Agent** " shall have the meaning assigned to such term in the preamble hereof.

"**Control**" means with respect to any asset, right or property with respect to which a security interest therein is perfected by a Secured Party's having "control" thereof (whether pursuant to the terms of an agreement or through the existence of certain facts and circumstances), that the intended Secured Party has "control" of such asset, right, or property as contemplated in the UCC.

"**Control Agreement**" means, with respect to any deposit account, any securities account, commodity account, securities entitlement or commodity contract, an agreement, in form and substance satisfactory to the Collateral Agent and the Required Holders, among the Collateral Agent , the financial institution or other Person at which such account is maintained or with which such entitlement or contract is carried and the Pledgor maintaining such account, effective to grant "control" (as defined under the applicable UCC) over such account to the Collateral Agent.

"**Copyright Security Agreement**" shall mean an agreement substantially in the form annexed hereto as Exhibit 2.

"**Copyrights**" shall mean, collectively (a) all copyrights, whether registered or unregistered, and whether published or unpublished, held pursuant to the laws of the United States, any State thereof or any other country, multi-national registry, or any political subdivision thereof; (b) registrations, applications, recordings and proceedings in the United States Copyright Office or in any similar office or agency of the United States, any State thereof or any other country, including the copyright registrations and applications listed in Schedule 5; (c) any continuations, renewals or extensions thereof; (d) any registrations to be issued in any pending applications, and shall include any right or interest in and to work protectable by any of the foregoing which are presently or in the future owned, created or authorized (as a work for hire for the benefit of any Pledgor) or acquired by any Pledgor, in whole or in part; (e) prior versions of works covered by copyright and all works based upon, derived from or incorporating such works; (f) income, royalties, damages, claims and payments now and hereafter due and/or payable with respect to copyrights, including, without limitation, damages, claims and recoveries for past, present or future infringement; (g) rights to sue for past, present and future

infringements of any copyright; and (h) any other rights corresponding to any of the foregoing rights throughout the world.

"**Distributions**" shall mean, collectively all dividends, cash, options, warrants, rights, instruments, distributions, returns of capital or principal, income, interest, profits and other property, interests (debt or equity) or proceeds, including as a result of a split, revision, reclassification or other like change of the Pledged Securities, from time to time received, receivable or otherwise distributed to the Pledgor in respect of or in exchange for any or all of the Pledged Securities or Pledged Intercompany Note.

"**Excluded Account**" means any deposit account (a) specifically and exclusively used for payroll, payroll taxes and other employee wage and benefit payments to or for the benefit of any Pledgor's employees, (b) which is used as an escrow account or as a fiduciary or trust account for the benefit of unaffiliated third parties, (c) which is a zero balance deposit account, or (d) which has deposits at any time in an aggregate amount not in excess of $100,000 for any one account and $250,000 in the aggregate for all such accounts excluded under this clause (e).

"**Excluded Assets**" shall mean (A) any fee-owned real property located outside the United States and any leasehold interest in real property located outside the United States, (B) all motor vehicles and other assets covered by a certificate of title (except to the extent a security interest therein can be perfected by the filing of a UCC financing statement or the equivalent under other applicable law), (C) any lease, license or agreement or any property subject to a purchase money security interest or capital lease, in each case, to the extent that a grant of a security interest therein would violate or invalidate such lease, license or agreement or purchase money or capital lease arrangement or create a right of termination in favor of any other party thereto (other than any Pledgor) after giving effect to the applicable anti-assignment provisions of the UCC or other applicable law, in each case, other than the proceeds and receivables thereof and only, in each case, to the extent, and only for so long as any such limitation or restriction set forth in this clause (C) is not terminated or rendered unenforceable or otherwise deemed ineffective by the UCC, any other laws (including bankruptcy, insolvency or similar laws), or principles of equity, and, to the extent severable, the security interest granted hereunder shall attach immediately to any portion of such assets not subject to such limitation or restriction; *provided* that immediately upon the ineffectiveness, lapse or termination of any such limitation or restriction, the Collateral shall include, and such Pledgor shall be deemed to have granted a security interest in, such assets as if such provision had never been in effect, (D) any Property where the cost of obtaining a security interest in, or perfection of, such assets exceeds the practical benefit to the Holders afforded thereby as reasonably determined by the Company and demonstrated to the satisfaction of the Required Holders in their sole discretion, (E) any intent-to-use application for registration of a Trademark prior to the filing of a "**Statement of Use**" or an "**Amendment to Allege Use**" with respect thereto, to the extent, if any, that, and solely during the period, if any, in which, the grant of a security interest therein would impair the validity or enforceability of such intent-to-use Trademark application or any registration issuing therefrom under applicable federal law, (F) the voting Capital Stock of any Foreign Subsidiary or FSHCO in excess of 65% of each class of outstanding voting Capital Stock of such Foreign Subsidiary or FSHCO, solely to the extent that such pledge in excess of 65% would reasonably be expected to result in material adverse tax consequences to the Company and its Subsidiaries as reasonably determined by the Company and demonstrated to the satisfaction of the Required Holders in their

sole discretion, and (G) any assets the grant of a security interest in which would be prohibited by applicable law but only, in each case, to the extent, and only for so long as, such prohibition is not terminated or rendered unenforceable or otherwise deemed ineffective by the UCC, any other laws (including bankruptcy, insolvency or similar laws), or principles of equity, and, to the extent severable, the security interest granted hereunder shall attach immediately to any portion of such assets that do not result in such prohibition; *provided* that immediately upon the ineffectiveness, lapse or termination of any such prohibition, the Collateral shall include, and such Pledgor shall be deemed to have granted a security interest in, such assets as if such provision had never been in effect.

"**FSHCO**" shall mean any Subsidiary substantially all of the assets of which (directly or through one or more disregarded entities for U.S. federal income tax purposes) consist of shares of Capital Stock (including, for this purpose, any debt or other instrument treated as equity for U.S. federal income tax purposes) of one or more Foreign Subsidiaries that are CFCs.

"**Guarantors**" shall have the meaning assigned to such term in the preamble hereof.

"**Indenture**" shall have the meaning assigned to such term in the recitals hereof.

"**Intellectual Property**" shall mean, collectively, all domestic, foreign and multi-national intellectual property rights of any kind, whether now or hereafter existing, including, without limitation, all Patents, Trademarks, Copyrights and Trade Secrets, together with any and all (i) rights and privileges arising under applicable law with respect to the use of any of the foregoing, (ii) rights to proceeds, income, fees, royalties, damages and payments now and hereafter due and/or payable thereunder and with respect thereto, including damages, claims and payments for past, present or future infringements, misappropriations, dilutions or other violations thereof, (iii) rights to sue or otherwise recover for past, present and future infringements, misappropriations, dilutions or other violations thereof, (iv) regulatory filings, (v) rights in computer programs (whether in source code, object code, or other form), algorithms, databases, compilations and data, technology supporting the foregoing, and all documentation, including user manuals and training materials, related to any of the foregoing, (vi) rights of publicity, privacy, and rights to personal information, (vii) all rights in the foregoing and in other similar intangible assets, (viii) all applications and registrations for the foregoing, and (ix) rights corresponding thereto throughout the world.

"**Intellectual Property Collateral**" shall mean, with respect to each Pledgor, all Intellectual Property of such Pledgor (including rights under Licenses), whether now owned or held, or hereafter acquired or created by or assigned to such Pledgor; *provided*, that notwithstanding any of the foregoing, Intellectual Property Collateral shall not include any Excluded Assets.

"**Issuer**" shall have the meaning assigned to such term in the preamble hereof.

"**Joinder Agreement**" shall mean an agreement substantially in the form annexed hereto as Exhibit 1.

"**Licenses**" shall mean all licenses, covenants not to sue and any other agreement granting any right with respect to any Intellectual Property (whether a Pledgor is the grantor or grantee thereunder).

"**Material Adverse Effect**" shall mean a material adverse effect on (a) the business affairs, operations or results of operations, or condition (financial or otherwise) of Pledgor and its Subsidiaries, taken as a whole, (b) the ability of the Pledgor to perform its payment obligations under the Notes Documents or (c) the rights and remedies of the Collateral Agent and the other Secured Parties under the Indenture or the other Notes Documents, taken as a whole.

"**Material IP Collateral**" shall mean any Intellectual Property Collateral that is material to the business of Pledgor and its Subsidiaries, taken as a whole.

"**Order**" shall mean any judgment, decree, verdict, order, consent order, consent decree, writ, declaration or injunction.

"**Organization Documents**" mean, collectively, with respect to any Person, (a) in the case of any corporation, the certificate of incorporation and by-laws (or similar constitutive documents) of such Person, (b) in the case of any limited liability company, the certificate of formation and operating agreement (or similar constitutive documents) of such Person, (c) in the case of any limited partnership, the certificate of formation and limited partnership agreement (or similar constitutive documents) of such Person, (d) in the case of any general partnership, the partnership agreement (or similar constitutive document) of such Person and (e) in any other case, the functional equivalent of the foregoing.

"**Patent Security Agreement**" shall mean an agreement substantially in the form annexed hereto as Exhibit 3.

"**Patents**" shall mean, collectively, all patents and all patent registrations and applications issued or applied for in the United States or any other country, multi-national registry, or any political subdivision thereof, including those listed in Schedule 5, together with any and all (i) inventions and improvements described and claimed therein, (ii) reissues, substitutions, reexaminations, divisions, renewals, extensions, continuations and continuations-in-part thereof and amendments thereto, (iii) all petty patents, divisionals and patents of addition, (iv) all patents to issue in any such applications, (v) income, royalties, damages, claims and payments now and hereafter due and/or payable with respect to patents, including, without limitation, damages, claims and recoveries for past, present or future infringement, and (vi) rights to sue for past, present and future infringements of any patent.

"**Pledged Collateral**" shall have the meaning assigned to such term in Section 2.1.

"**Pledged Debt**" shall have the meaning assigned to such term in Section 3.4(a).

"**Pledged Intercompany Note**" shall mean a global intercompany note in substantially the form attached hereto as Exhibit 5, evidencing all intercompany Indebtedness owed to any Pledgor, as may be updated from time to time.

"**Pledged Interests**" shall mean, collectively, with respect to each Pledgor, (i) all membership, partnership or other Capital Stock (other than in a corporation), as applicable, now or hereafter owned by such Pledgor at any time including without limitation, those of each issuer described in Schedule 4 hereto, together with all rights, privileges, authority and powers of such Pledgor in and to each such issuer or under any Organization Document of each such issuer and (ii) the certificates, instruments and agreements representing such membership, partnership or other interests and any and all interest of such Pledgor in the entries on the books of any securities intermediary pertaining to such membership, partnership or other Capital Stock; *provided*, that notwithstanding any of the foregoing, Pledged Interests shall not include any Excluded Assets.

"**Pledged Securities**" shall mean, collectively, the Pledged Interests and the Pledged Shares; *provided*, that notwithstanding any of the foregoing, Pledged Securities shall not include any Excluded Assets.

"**Pledged Shares**" shall mean, collectively, with respect to each Pledgor, (i) the issued and outstanding shares of Capital Stock, whether certificated or uncertificated, now or hereafter owned by such Pledgor at any time, together with all rights, privileges, authority and powers of such Pledgor relating to such interests in each such issuer or under any Organization Document of each such issuer and (ii) the certificates, instruments and agreements representing such shares of Capital Stock and any and all interest of such Pledgor in the entries on the books of the issuer of such shares or of any financial intermediary pertaining to the Pledged Shares; *provided*, that notwithstanding any of the foregoing, Pledged Shares shall not include any Excluded Assets.

"**Pledgor**" shall have the meaning assigned to such term in the preamble hereof.

"**Registered Organization**" is any "registered organization" as defined in the Code with such additions to such term as may hereafter be made.

"**Secured Parties**" shall mean the Collateral Agent, the Trustee, the Note Agents and the Holders of Notes.

"**Securities Collateral**" shall mean, collectively, the Pledged Securities, the Pledged Intercompany Note and the Distributions; *provided*, that notwithstanding any of the foregoing, Securities Collateral shall not include any Excluded Assets.

"**Trade Secrets**" shall mean, collectively, all trade secrets and all other confidential or proprietary information, data and know-how, whether or not reduced to a writing or other tangible form.

"**Trademark Security Agreement**" shall mean an agreement substantially in the form annexed hereto as Exhibit 4.

"**Trademarks**" shall mean, collectively, all trademarks (including service marks), slogans, logos, certification marks, trade dress, uniform resource locations (URLs), domain names, corporate names, trade names, or other indicia of source, whether registered or unregistered, and all registrations and applications for the foregoing (whether statutory or common law and whether registered or applied for in the United States or any other country,

multi-national registry, or any political subdivision thereof), including those trademark and service mark registrations and applications listed in Schedule 5 together with any and all (i) goodwill of the business connected with the use thereof and symbolized thereby, (ii) income, royalties, damages, claims and payments now and hereafter due and/or payable with respect thereto, including, without limitation, damages, claims and recoveries for past, present or future infringement, (iii) rights to sue for past, present and future infringements thereof and (iv) extensions and renewals thereof and amendments thereto.

"**UCC**" shall mean the Uniform Commercial Code as in effect on the date hereof in the State of New York; *provided, however*, that if by reason of mandatory provisions of applicable law, any or all of the attachment, perfection or priority of the Collateral Agent's and the other Secured Parties' security interest in any item or portion of the Pledged Collateral is governed by the Uniform Commercial Code in a jurisdiction other than the State of New York, the term "**UCC**" shall mean the Uniform Commercial Code as in effect on the date hereof in such other jurisdiction for purposes of the provisions hereof relating to such attachment, perfection or priority and for purposes of definitions relating to such provisions.

"**Uncertificated Security**" shall have the meaning assigned to such term in Section 3.2.

"**USCO**" means the United States Copyright Office.

"**USPTO**" means the United States Patent and Trademark Office.

SECTION 1.2Interpretation. The interpretive provisions specified in the Indenture shall be applicable to this Agreement. No failure on the part of the Collateral Agent to provide any Pledgor with any notice expressly required hereunder in connection with the exercise of any right, power or remedy hereunder shall impair the validity of exercise of such right, power or remedy.

SECTION 1.3Resolution of Drafting Ambiguities. Each Pledgor acknowledges and agrees that it was represented by counsel in connection with the execution and delivery hereof, that it and its counsel reviewed and participated in the preparation and negotiation hereof and that any rule of construction to the effect that ambiguities are to be resolved against the drafting party shall not be employed in the interpretation hereof.

ARTICLE II

GRANT OF SECURITY AND SECURED OBLIGATIONS

SECTION 2.1Grant of Security Interest. As collateral security for the payment and performance in full of all the Obligations, each Pledgor hereby pledges and grants to the Collateral Agent for the ratable benefit of the Secured Parties, a Lien on and security interest in and to all of the right, title and interest of such Pledgor in, to and under the following Property, wherever located, whether now existing or hereafter arising or acquired from time to time (collectively, giving effect to clause (a) of the proviso in this Section 2.1, the "**Pledged Collateral**"):

(i) all Accounts;

(ii) all Equipment, Goods, Inventory and Fixtures;

(iii)all Documents, Instruments and Chattel Paper;

(iv)all Letter-of-Credit Rights;

(v) all Securities Collateral;

(vi)all Investment Property and Deposit Accounts;

(vii)all Intellectual Property Collateral;

(viii)all Commercial Tort Claims, including, without limitation, the Commercial Tort Claims described on Schedule 1 hereto (as such Schedule may be supplemented from time to time pursuant to Section 3.4(f));

(ix)all General Intangibles;

(x) all Money;

(xi)all Supporting Obligations;

(xii)all books and records pertaining to any and/or all of the foregoing;

(xiii)to the extent not covered by clauses (i) through (xii) of this sentence, choses in action of such Pledgor, whether tangible or intangible; and

(xiv)all Proceeds and products of each of the foregoing and all accessions to, substitutions and replacements for, and rents, profits and products of, each of the foregoing, and any and all Proceeds of any insurance, indemnity, warranty or guaranty payable to such Pledgor from time to time with respect to any of the foregoing.

Notwithstanding anything to the contrary contained in clauses (i) through (xiv) above or any other provision of this Agreement or any other Notes Document, the security interest created by this Agreement shall not extend to, and the term "Pledged Collateral" and "Intellectual Property Collateral" shall not include, any Excluded Assets.

Notwithstanding anything to the contrary contained herein, immediately upon any Property of a Pledgor ceasing to constitute Excluded Assets, the Pledged Collateral shall include, and the Issuer and the other Pledgors, as applicable, shall be deemed to have granted a security interest in, such Property.

SECTION 2.2Filings.

(a) Each Pledgor hereby irrevocably authorizes the Collateral Agent at any time and from time to time prior to the termination of this Agreement pursuant to Section 10.3 to file (but the Collateral Agent shall have no duty to file), in any relevant jurisdiction any financing statements prepared by the Issuer (including fixture filings), continuation statements and amendments thereto that contain the information required by Article 9 of the UCC of each

applicable jurisdiction for the filing of any financing statement, continuation statement or amendment thereto relating to the Pledged Collateral, including (i) whether such Pledgor is an organization, the type of organization and any organizational identification number issued to such Pledgor and (ii) in the case of a financing statement filed as a fixture filing or covering Pledged Collateral constituting minerals or the like to be extracted or timber to be cut, a sufficient description of the Real Property to which such Pledged Collateral relates. Each Pledgor agrees to prepare and provide all information described in the immediately preceding sentence to the Collateral Agent. Such financing statements may describe the collateral in the same manner as described herein or may contain a description of collateral that describes such Property in any other manner as the Pledgor may determine, in its reasonable discretion, is necessary or advisable to ensure the perfection of the security interest in the collateral granted to the Collateral Agent in connection herewith, including, describing such Property as "all assets whether now owned or hereafter acquired and all proceeds thereof" or "all personal property whether now owned or hereafter acquired and all proceeds thereof" or words of similar meaning (regardless of whether any particular asset comprised in the Pledged Collateral falls within the scope of Article 9 of the UCC).

(b) Each Pledgor hereby further authorizes the Collateral Agent to file (but the Collateral Agent shall have no duty to file), instruments with the USPTO or the USCO (or any successor office) or in any similar office or agency of the United States, any State thereof or any other country, including Copyright Security Agreements, Patent Security Agreements and Trademark Security Agreements, or other documents that are necessary for the purpose of perfecting, confirming, continuing, enforcing or protecting the pledge and security interest granted by such Pledgor hereunder in (i) any Intellectual Property Collateral owned by Pledgor and (ii) any Exclusive IP Licenses, in each case naming such Pledgor, as debtor, and the Collateral Agent , as secured party.

(c) Subject to the other terms, limitations and conditions set forth in this Agreement and the other Notes Documents, notwithstanding the grant of authority to the Collateral Agent under this section, the Pledgors shall prepare, record, file or cause to be filed, at their own expense, any and all financing statements, continuation statements, amendments, instruments with the USPTO or the USCO (or any successor office) or in any similar office or agency of the United States, any State thereof or any other country, and other documents and agreements as may be reasonably necessary (as determined by the Issuer in good faith) to perfect and maintain the perfection of the Collateral Agent's security interest over the Pledged Collateral ,and to deliver a file stamped copy of each such financing statement or other evidence of filing to the Collateral Agent.

ARTICLE III

PERFECTION; SUPPLEMENTS; FURTHER ASSURANCES; USE OF PLEDGED COLLATERAL

SECTION 3.1 Delivery of Certificated Securities Collateral. Each Pledgor represents and warrants that as of the date hereof, Schedule 3 hereto sets forth the office of the secretary of state (or similar central filing office) of the relevant state(s) in which a filing pursuant to the UCC would perfect the security interests granted by this Agreement with respect to the Pledged

Collateral (solely to the extent such security interests in the Pledged Collateral can be perfected by such filing). Each Pledgor represents and warrants that as of the date hereof, Schedule 4 hereto sets forth all Pledged Securities of such Pledgor. Each Pledgor represents and warrants that (i) all certificates or instruments representing or evidencing any Pledged Securities and (ii) the Pledged Intercompany Note will be delivered to the Collateral Agent (or its designee) in suitable form for transfer by delivery and accompanied by duly executed instruments of transfer or assignment in blank and that, upon such delivery, the Collateral Agent will have a valid and perfected first priority security interest therein (subject, as to priority, to senior Liens permitted by the Indenture) within 5 Business Days of the date hereof. Each Pledgor hereby agrees that (i) all certificates or instruments representing or evidencing any Pledged Securities acquired by such Pledgor after the date hereof and (ii) a joinder to the Pledged Intercompany Note in respect of any Pledgor that executes a Joinder Agreement, in each case shall, within 30 days after receipt thereof by such Pledgor or execution of such Joinder Agreement, as applicable, be delivered to the Collateral Agent (or its designee) pursuant hereto and shall be in suitable form for transfer by delivery and shall be accompanied by duly executed instruments of transfer or assignment in blank. Each delivery of Pledged Securities shall be accompanied by a schedule describing such Pledged Securities, which schedule shall be deemed to supplement Schedule 4 and made a part thereof; *provided* that failure to supplement Schedule 4 shall not affect the validity of such pledge of such Pledged Securities or the Pledged Intercompany Note. Each schedule so delivered shall supplement, or amend and restate, as applicable, any prior schedules so delivered.

The Collateral Agent shall have the right (but not the obligation), at any time upon the occurrence and during the continuance of any Event of Default, upon prior written notice (which may be concurrent) to Issuer, to endorse, assign or otherwise transfer to or to register in the name of the Collateral Agent or any of its nominees or endorse for negotiation any or all of such Pledged Securities or Pledged Intercompany Note, without any indication that such Pledged Securities or Pledged Intercompany Note are subject to the security interest hereunder. In addition, the Collateral Agent shall have the right (but not the obligation) at any time upon the occurrence and during the continuance of any Event of Default to exchange certificates or Instruments representing or evidencing any Pledged Securities or the Pledged Intercompany Note for certificates or Instruments of smaller or larger denominations for any purpose consistent with this Agreement.

SECTION 3.2Perfection of Other Securities Collateral. Each Pledgor represents and warrants that, subject to the provisions of Section 4.2, upon the filing of UCC financing statements in the jurisdictions indicated on Schedule 3, the Collateral Agent has a valid and perfected first priority security interest (subject, as to priority, to senior Liens permitted by the Indenture) under applicable U.S. federal or state law in all Pledged Securities not represented by a certificated interest ("**Uncertificated Security**") pledged by it hereunder that are in existence on the date hereof, to the extent such security interest can be perfected by the filing of an appropriate UCC financing statement. Pledged Interests shall either (i) be represented by a certificate, and in the organizational documents of such entity, the applicable Pledgor shall cause the issuer of such interests (or use commercially reasonable efforts to cause the issuer if such issuer is not an Affiliate of such Pledgor), to elect to treat such interests as a "security" within the meaning of Article 8 of the UCC of its jurisdiction of organization or formation, as applicable, by including in its organizational documents language that such interests shall be a "security" (within the meaning of Article 8 of the UCC) governed by Article 8 of the UCC, or (ii) not be

represented by a certificate and the applicable Pledgor shall cause the issuer of such interests not to have elected to treat such interests as a "security" within the meaning of Article 8 of the UCC.

If any of the Pledged Securities is or shall become evidenced or represented by an Uncertificated Security, such Pledgor shall cause the issuer thereof (or use commercially reasonable efforts to cause if the issuer is not an Affiliate of such Pledgor) either (i) to register the Collateral Agent as the registered owner of such Uncertificated Security, upon original issue or registration of transfer, or (ii) to agree in writing with such Pledgor and the Collateral Agent that such issuer will comply with instructions with respect to such Uncertificated Security originated by the Collateral Agent without further consent of such Pledgor.

SECTION 3.3Financing Statements and Other Filings; Maintenance of Perfected Security Interest. Each Pledgor agrees that at the sole reasonable cost and expense of the Pledgors (i) such Pledgor shall furnish to the Collateral Agent from time to time information further identifying and describing the Pledged Securities and Pledged Debt as may be required, all in reasonable detail, and (ii) at any time and from time to time, such Pledgor shall promptly and duly prepare, execute and deliver, and cause to be filed and recorded, such further instruments and documents and take such further action as is reasonably necessary for the purpose of obtaining or preserving the full benefits of this Agreement and the rights and powers herein granted, including (x) the filing of any financing statements and amendments thereto, continuation statements and other documents (including this Agreement) under the UCC (or other similar laws) in effect in the United States or any of its States with respect to the security interest created hereby and (y) the execution and delivery of Patent Security Agreements, Copyright Security Agreements, and Trademark Security Agreements, and filing of such or other instruments with the USPTO or the USCO (or any successor office), as applicable.

SECTION 3.4Other Actions. In order to further ensure the attachment, perfection and priority of, and the ability of the Collateral Agent to enforce, the Collateral Agent's security interest in the Pledged Collateral, each Pledgor (i) represents and warrants and/or (ii) covenants, at such Pledgor's own expense, to take the following actions, in each case with respect to the following Pledged Collateral:

(a) Instruments and Tangible Chattel Paper. As of the date hereof, each Pledgor hereby represents and warrants that (i) no amounts individually in excess of $1,000,000 payable to such Pledgor under or in connection with any of the Pledged Collateral (other than amounts owed by another Pledgor) are evidenced by any Instrument (other than checks to be deposited in the ordinary course of business) or Tangible Chattel Paper (other than documents or records evidencing amounts owed by customers in the ordinary course of business pursuant to deferred payment procedures) other than the Instruments and Tangible Chattel Paper listed in Schedule 6 and (ii) each such Instrument and each such item of Tangible Chattel Paper individually in excess of $1,000,000 (other than checks to be deposited in the ordinary course of business) has been or will be properly endorsed and delivered to the Collateral Agent (or its designee) within 5 days after the date hereof, accompanied by instruments of transfer or assignment duly executed in blank. If any amount, individually, in excess of $1,000,000 then payable under or in connection with any of the Pledged Collateral (other than any amount owed by any Pledgor) shall be evidenced by any Instrument (other than checks to be deposited in the ordinary course of business) or Tangible Chattel Paper (other than documents or records

evidencing amounts owed by customers in the ordinary course of business pursuant to deferred payment procedures) (such Instruments and Tangible Chattel Paper, collectively, together with the Pledged Intercompany Note, the "**Pledged Debt**") and has not previously been delivered to the Collateral Agent , the Pledgor acquiring such Instrument or Tangible Chattel Paper shall promptly (and in any event within 30 days after acquisition by such Pledgor) endorse, assign and deliver the same to the Collateral Agent (or its designee), accompanied by such instruments of transfer or assignment duly executed in blank in form and substance reasonably satisfactory to the Collateral Agent and the Required Holders; *provided, however*, that so long as no Event of Default has occurred and is continuing, upon written request by such Pledgor, the Collateral Agent (or its designee) shall promptly (and in any event within 10 Business Days) return such Instrument or Tangible Chattel Paper to such Pledgor from time to time, to the extent necessary for collection or cancellation thereof in the ordinary course of such Pledgor's business. The Collateral Agent shall have no duty to determine, monitor or confirm transferability or assignability of any Instrument or Tangible Chattel Paper delivered hereunder.

(b) [Reserved].

(c) [Reserved].

(d) [Reserved].

(e) Letter-of-Credit Rights. As of the date hereof, no Pledgor is the beneficiary or assignee under any letter of credit, other than those listed on Schedule 2 hereto. The parties hereto acknowledge and agree that under no circumstances shall any Pledgor hereunder be under any obligation to take any perfection steps (other than the filing of appropriate financing statements under the UCC) with respect to any security interest granted in any letter of credit under which any Pledgor is a beneficiary having a value reasonably believed by the Pledgors to be, individually, less than $1,000,000. If any Pledgor shall become the beneficiary or assignee under any letter of credit with a value, individually, in excess of $1,000,000 that is not a Supporting Obligation with respect to any of the Pledged Collateral, such Pledgor shall either (i) use commercially reasonable efforts to arrange for the issuer and any confirmer of such letter of credit to consent to an assignment to the Collateral Agent of the proceeds of any drawing under such letter of credit or (ii) use commercially reasonable efforts to arrange for the Collateral Agent to become the transferee beneficiary of such letter of credit, with the Collateral Agent agreeing, in each case, that the proceeds of any drawing under such letter of credit are to be paid to the applicable Pledgor unless an Event of Default has occurred and is continuing.

(f) Commercial Tort Claims. As of the date hereof, each Pledgor hereby represents and warrants that it holds no Commercial Tort Claims alleging damages, individually, in excess of $1,000,000 for which such Pledgor has filed a complaint in a court of competent jurisdiction, other than those listed on Schedule 1 hereto. If any Pledgor shall at any time hold or acquire a Commercial Tort Claim alleging damages, individually, in excess of $1,000,000, such Pledgor shall promptly (and in any event within 15 days of acquiring such Commercial Tort Claim) notify the Collateral Agent in a writing signed by such Pledgor of the brief details thereof and grant to the Collateral Agent in such writing a security interest therein and in the Proceeds thereof, all upon the terms of this Agreement. Unless otherwise agreed, the grant of a

security interest in any such Commercial Tort Claim shall not prejudice the right of such Pledgor to prosecute, enforce or exercise any of its rights in connection with such Commercial Tort Claim, which it will continue to enjoy until an Event of Default has occurred and is continuing.

(g) Landlord Waivers; Collateral Access Agreements. At any time any Collateral with a book value in excess of $500,000 (when aggregated with all other Collateral at the same location) is located on any real property of a Pledgor (whether such real property is now existing or acquired after the date hereof) which is not owned by a Pledgor, or is stored on the premises of a bailee, warehouseman, or similar party, use its best efforts to obtain written subordinations or waivers or collateral access agreements, as the case may be, in form and substance satisfactory to the Collateral Agent and the Required Holders.

(h) Control Agreements. Within 90 days of the date hereof (or such later date as may be agreed by the Collateral Agent, acting at the direction of the Required Holders), each Pledgor shall, with respect to each account of such Pledgor (other than Excluded Accounts) deliver to the Collateral Agent a Control Agreement in form and substance satisfactory to the Collateral Agent and the Required Holders with respect to such account. Subject to the foregoing sentence, Pledgors shall not maintain cash, Cash Equivalents or other amounts in any deposit account or securities account (other than Excluded Accounts), unless the Collateral Agent shall have received a Control Agreement in respect of each such account.

SECTION 3.5 Joinder of Additional Guarantors. The Pledgors shall cause each Subsidiary of Issuer that, from time to time, after the date hereof shall be required to become a Guarantor for the benefit of the Secured Parties pursuant to Section 3.16 of the Indenture, to execute and deliver to the Collateral Agent a Joinder Agreement within 60 days after the date on which it was acquired or created and, upon such execution and delivery, such Subsidiary shall constitute a "Guarantor" and a "Pledgor" for all purposes under the Indenture and hereunder with the same force and effect as if originally named as a Guarantor and Pledgor therein and herein. The execution and delivery of such Joinder Agreement shall not require the consent of any Pledgor hereunder. The rights and obligations of each Pledgor hereunder shall remain in full force and effect notwithstanding the addition of any new Guarantor and Pledgor as a party to this Agreement or any other Notes Document.

ARTICLE IV

REPRESENTATIONS, WARRANTIES AND COVENANTS

Each Pledgor represents, warrants and covenants as follows:

SECTION 4.1 Title; Consent.

(a) Except for the security interest granted to the Collateral Agent for the ratable benefit of the Secured Parties pursuant to this Agreement, such Pledgor owns (or, in the case of the Intellectual Property Collateral, either owns or has a License to) and, as to Pledged Collateral acquired by it from time to time after the date hereof, will either own or hold a License to the rights in each item of Pledged Collateral pledged by it hereunder free and clear of any and

all Liens of others, except as otherwise permitted by the Notes Documents. As of the date hereof, there are no outstanding warrants, options or other rights to purchase, or shareholder, voting trust or similar agreements outstanding with respect to, or Property that is convertible into, or that requires the issuance or sale of, any Pledged Securities that constitute Capital Stock (in each case, other than to any Pledgor). No person other than the Collateral Agent (or (i) its bailee for such purpose or (ii) the Pledgor that owns such Pledged Securities, Pledged Debt or Deposit Account, as applicable) has, or will have, control or possession of all or any part of the Pledged Securities, Pledged Debt or Deposit Account, except as permitted by the Notes Documents.

(b) Other than as required by (i) foreign laws with respect to the Capital Stock in any Foreign Subsidiary and (ii) laws affecting the offering and sale of securities generally, no consent of any Person, including any general or limited partner, any other member or manager of a limited liability company, any shareholder or any other trust beneficiary, is necessary (from the perspective of a secured party) in connection with the creation, perfection or first priority status (or the maintenance thereof) of the security interest of the Collateral Agent in any Capital Stock pledged to the Collateral Agent under this Agreement and the other Collateral Documents or the exercise by the Collateral Agent of any remedies in respect of any Pledged Securities, except in each case as have already been obtained.

SECTION 4.2Validity of Security Interest. The security interest in, and Lien on, the Pledged Collateral granted to the Collateral Agent for the ratable benefit of the Secured Parties hereunder constitutes (a) a legal and valid security interest in all the Pledged Collateral securing the payment and performance of the Obligations, and (b) upon completion of the perfection steps set forth below, a perfected first priority security interest (subject, as to priority, to senior Liens permitted by the Indenture) in all the Pledged Collateral with respect to which a lien may be perfected by (i) filing a financing statement pursuant to the UCC in the office of the secretary of state (or similar central filing office) or local filing office, or in any similar office or agency of the United States, any State thereof or any other country, (ii) possession or Control by the Collateral Agent (or its bailee for such purpose and subject to the time periods provided in Article 3 of this Agreement) or (iii) filing Patent Security Agreements, Copyright Security Agreements and Trademark Security Agreements with the USPTO or USCO, as applicable, or in any similar office or agency of the United States, any State thereof or any other country.

SECTION 4.3Defense of Claims. Each Pledgor shall, at its own cost and expense, take any and all commercially reasonable actions necessary to or as are reasonably requested by the Collateral Agent (acting at the direction of the Required Holders) or the Required Holders to defend title to the Pledged Collateral pledged by it hereunder and the security interest therein and Lien thereon granted to the Collateral Agent and the priority thereof against all material claims and demands of all persons at any time claiming any interest therein adverse to the Collateral Agent or any other Secured Party, in each case except as permitted by the Indenture. Each Pledgor shall promptly notify the Collateral Agent in writing of any claims or demands of the type described in the foregoing sentence.

SECTION 4.4Other Financing Statements. No Pledgor has filed, nor authorized any third party to file, any valid or effective financing statement (or similar statement or instrument of registration under the law of any jurisdiction) covering or purporting to cover any interest of

any kind in the Pledged Collateral, except such as have been filed in favor of the Collateral Agent pursuant to this Agreement or as permitted under the Indenture. Until the satisfaction and discharge of the Indenture in accordance with Section 3.01 thereof, no Pledgor shall execute, authorize or consent to be filed in any public office any financing statement (or similar statement or instrument of registration under the law of any jurisdiction) relating to any Pledged Collateral, except financing statements and other statements and instruments filed or to be filed in respect of and covering the security interests granted by such Pledgor to the holder(s) of Indebtedness permitted under the Indenture.

SECTION 4.5Chief Executive Office; Change of Name; Jurisdiction of Organization, etc. Such Pledgor shall give the Collateral Agent written notice within at least 5 Business Days of the occurrence of any change to its name, legal structure (whether by merger, consolidation, change in corporate form or otherwise), type of organization, jurisdiction of organization, organizational identification number if it has one (but solely to the extent such organizational identification number is required to be set forth on financing statements under the applicable UCC) or, in the case of any Pledgor that is not a Registered Organization, its sole place of business (or, if it has more than one place of business, its chief executive office). In such event, such Pledgor shall take all steps reasonably necessary (as determined by the Issuer in good faith) to maintain the Collateral Agent's valid and perfected security interest with the priority required hereunder in such Pledgor's property constituting Pledged Collateral. The Collateral Agent shall not be liable nor responsible to any party for any failure to maintain a valid and perfected security interest with the priority required hereunder in the Pledgor's property constituting Pledged Collateral. The Collateral Agent shall have no duty to inquire about such changes, the parties acknowledging and agreeing that it would not be feasible or practical for the Collateral Agent to search for information on such changes if such information is not provided by any Pledgor.

SECTION 4.6 Due Authorization and Issuance. All of the Pledged Shares have been duly authorized, validly issued and are fully paid and non-assessable (if applicable). All of the Pledged Interests have been fully paid for.

SECTION 4.7Pledged Collateral. As of the date hereof, all information set forth in the schedules annexed hereto relating to the Pledged Collateral, is accurate and complete in all material respects. As of the date of delivery of any updated information to the schedules hereto expressly required under this Agreement, such information shall be accurate and complete in all material respects.

SECTION 4.8Insurance. Each Pledgor will at all times keep its property insured in favor of the Collateral Agent , and all policies or certificates (or certified copies thereof) with respect to such insurance (i) shall be endorsed to the Collateral Agent (including, without limitation, by naming the Collateral Agent as loss payee and/or additional insured) and (ii) if agreed by the insurer (which agreement the Company shall use commercially reasonable efforts to obtain), shall state that such insurance policies shall not be canceled without at least 30 days' prior written notice thereof (or, with respect to non-payment of premiums, 10 days' prior written notice) by the respective insurer to the Collateral Agent ; provided, that the requirements of this Section 4.8 shall not apply to (x) insurance policies covering (1) directors and officers, fiduciary or other professional liability, (2) employment practices liability, (3) workers compensation

liability, (4) automobile and aviation liability, and (5) health, medical, dental and life insurance; and (y) self-insurance programs; provided further that endorsements required by this Section 4.8 shall not be required to be delivered until the date that is ten (10) Business Days after the date of this Agreement (or such later date as the Collateral Agent, acting at the direction of the Required Holders, agree).

SECTION 4.9 Intellectual Property.

(a) any Intellectual Property Collateral owned by any Pledgor is valid, subsisting, unexpired and enforceable and has not been abandoned or adjudged invalid or unenforceable, in whole or in part, except Intellectual Property Collateral that is not Material IP Collateral;

(b) each Pledgor is the sole and exclusive owner of the entire and unencumbered right, title and interest in and to all Intellectual Property Collateral that is owned or purported to be owned (solely or jointly with others) by such Pledgor and no claim is pending that the use of such Intellectual Property Collateral by such Pledgor does or may, conflict with, infringe, misappropriate, dilute, misuse or otherwise violate, any of the rights of any third party in any material respect with respect to such Intellectual Property Collateral;

(c) each Pledgor has made all necessary filings and recordations to protect its interest in any Intellectual Property Collateral owned by such Pledgor to the extent such filing or recordation is necessary for the conduct of the business substantially in the manner presently conducted, including recordations of all of its interests in the owned Patent Collateral and Trademark Collateral in the USPTO or foreign equivalent, and its claims to the owned Copyright Collateral in the United States Copyright Office (the "USCO") or foreign equivalent, and, to the extent necessary, has used proper statutory notice in connection with its use of any Patent, Trademark and Copyright in any of Trade Secrets that constitute Intellectual Property Collateral;

(d) each Pledgor has taken all commercially reasonable steps to safeguard its Trade Secrets that constitute Intellectual Property Collateral and, to the knowledge of each Pledgor, (i) none of the Trade Secrets that constitute Intellectual Property Collateral of such Pledgor has been used, divulged, disclosed or appropriated for the benefit of any other Person other than a Pledgor; (ii) no employee, independent contractor or agent of such Pledgor has, to the knowledge of any Pledgor, misappropriated any Trade Secrets of any other Person in the course of the performance of such Person's duties as an employee, independent contractor or agent of such Pledgor; and (iii) no employee, independent contractor or agent of such Pledgor is in default or breach of any term of any employment agreement, non-disclosure agreement, assignment of inventions agreement or similar agreement or contract relating in any way to the protection, ownership, development, use or transfer of such Pledgor's Trade Secrets that constitute Intellectual Property Collateral;

(e) no Pledgor has entered into any or bound by any written settlement or consents, covenant not to sue, nonassertion assurance, or release that adversely affects its rights in any material respect to own or use any of the Intellectual Property Collateral;

(f) each Pledgor has not granted a Lien on any Intellectual Property Collateral owned by such Pledgor that has not been terminated or released except Permitted Liens;

(g) each Pledgor has executed and delivered to the Administrative Agent Intellectual Property Collateral security agreements to be filed in the USPTO or the USCO or in any similar office or agency of the United States for all applications and registrations for all Copyrights, Patents and Trademarks owned by such Pledgor constituting Intellectual Property Collateral;

(h) each Pledgor (i) uses commercially reasonable efforts (and in any event, efforts no less than generally accepted industry practices) designed to ensure the quality of the manufacture, distribution and sale of all products sold by the Pledgor and in the provision of all services rendered under or in connection with all Trademarks and (ii) has taken all actions necessary to ensure that all licensees of the Trademarks owned by such Pledgor use such adequate standards of quality;

(i) the consummation of the transactions contemplated by the Indenture and this Agreement will not result in the termination or impairment of any Intellectual Property Collateral; and

(j) such Pledgor owns or is entitled to use by license, lease or other agreement, all Patents, Trademarks, Trade Secrets, Copyrights, mask works, licenses, technology, know-how, processes and rights with respect to any of the foregoing as necessary to conduct the business and operations of such Pledgor substantially in the manner presently conducted and, at minimum, in accordance with industry standard business practices.

SECTION 4.10 Post-Closing Matters. Notwithstanding any conditions precedent, representations or covenants in the Notes Documents to the contrary (each such condition, representation and covenant deemed modified to the extent necessary to effect the following, and to permit the taking of the actions described herein within the time periods described herein), in no event later than 90 days following the date hereof, the Pledgors shall file or cause to be filed such documents and agreements as may be required by Section 4.1 with respect to any Intellectual Property Collateral owned by Pledgors that is registered in a country other than the United States.

ARTICLE V

CERTAIN PROVISIONS CONCERNING SECURITIES COLLATERAL

SECTION 5.1 Voting Rights; Distributions; etc.

(i) So long as no Event of Default shall have occurred and be continuing and subject to the provisions of Section 5.1(ii):

(A) each Pledgor shall be entitled to exercise any and all voting and other consensual rights pertaining to the Securities Collateral or any part thereof for any purpose not inconsistent with the terms or purposes of this Agreement and the other

Notes Documents; *provided*, *however*, that no Pledgor shall in any event exercise such rights in any manner that would be adverse in any material respect to the ability of the Collateral Agent to exercise rights and remedies hereunder after the occurrence and during the continuance of an Event of Default; and

(B) each Pledgor shall be entitled to receive and retain, and to utilize free and clear of the Lien granted hereunder, any and all Distributions; *provided, however*, that any and all such Distributions consisting of rights or interests in the form of certificated Pledged Securities or Pledged Intercompany Note shall be subject to the requirements of Sections 3.1 and 3.2.

(ii) Upon the occurrence and during the continuance of any Event of Default upon prior written notice (which may be concurrent) from the Collateral Agent to Issuer:

(A) all rights of each Pledgor to exercise the voting and other consensual rights it would otherwise be entitled to exercise pursuant to Section 5.1(i)(A) shall cease, and all such rights shall thereupon become automatically vested in the Collateral Agent, which shall thereupon have the right (but not the obligation) to exercise such voting and other consensual rights (but if directed by the Trustee (at the direction of the Required Holders) or the Required Holders, the Collateral Agent shall have the right from time to time following and during the continuance of an Event of Default to permit the Pledgors to exercise such rights) until the applicable Event of Default is no longer continuing, at which time all such rights automatically shall revert to such Pledgor, and in which case the Collateral Agent's rights under this Section 5.1(ii)(A) shall cease to be effective, subject to revesting in the event of a subsequent Event of Default that is continuing and upon prior written notice from the Collateral Agent as set forth above; and

(B) all rights of each Pledgor to receive Distributions that it would otherwise be authorized to receive and retain pursuant to Section 5.1(i)(B) without further action shall cease and all such rights shall thereupon become vested in the Collateral Agent , which shall thereupon have the sole right to receive and hold as Pledged Collateral such Distributions until all Event of Defaults are no longer continuing, in which case the Collateral Agent's rights under this Section 5.1(ii)(B) shall cease to be effective, subject to revesting in the event of a subsequent Event of Default that is continuing and upon prior written notice from the Collateral Agent as set forth above.

(iii)Each Pledgor shall, at its sole cost and expense, from time to time execute and deliver to the Collateral Agent appropriate instruments as may be reasonably necessary (as determined by the Issuer in good faith) or as the Collateral Agent or the Required Holders may reasonably request in writing to permit the Collateral Agent to exercise the voting and other rights which it may be entitled to exercise pursuant to Section 5.1(ii)(A) and to receive all Distributions which it may be entitled to receive under Section 5.1(ii)(B).

(iv)All Distributions that are received by any Pledgor contrary to the provisions of Section 5.1(ii)(B) shall be received in trust for the benefit of the Collateral Agent ,

shall be promptly (and in any event within three (3) Business Days) paid over to the Collateral Agent as Pledged Collateral in the same form as so received (with any necessary or reasonably requested endorsement).

ARTICLE VI

CERTAIN PROVISIONS CONCERNING INTELLECTUAL PROPERTY COLLATERAL

SECTION 6.1 Grant of License.

(a) Effective upon the occurrence and during the continuation of an Event of Default, for the purpose of enabling the Collateral Agent to exercise rights and remedies under this Agreement, each Pledgor grants to the Collateral Agent an irrevocable (subject to termination under Section 10.3), nonexclusive license (exercisable without payment of royalty or other compensation to the Pledgors) to use, license or sublicense any Intellectual Property now owned or hereafter acquired by such Pledgor, and wherever the same may be located, and including in such license reasonable access to all media in which any of the licensed items may be recorded or stored and to all computer software and programs used for the compilation or printout thereof, to the extent that such non-exclusive license (a) does not violate the express terms of any agreement between a Pledgor and a third party governing the applicable Pledgor's use of such Intellectual Property, or gives such third party any right of acceleration, modification, termination or cancellation therein and (b) is not prohibited by any applicable law; *provided*, that such licenses to be granted hereunder with respect to Trademarks shall be subject to the maintenance of quality standards with respect to the goods and services on which such Trademarks are used sufficient to preserve the validity of such Trademarks. The use of such license by the Collateral Agent may only be exercised, at the option of the Collateral Agent (acting at the direction of the Required Holders), upon the occurrence and during the continuation of an Event of Default; *provided*, *further*, that any license, sublicense or other transaction entered into by the Collateral Agent in accordance herewith shall be binding upon the Pledgors notwithstanding any subsequent cure of an Event of Default.

SECTION 6.2 Scheduled Intellectual Property. Schedule 5 correctly sets forth all issued Patents, Patent applications, registered Trademarks and applications for registration thereto, and registered Copyrights, in each case, issued, applied-for or registered and owned by each Pledgor in its own name as of the date hereof and all Exclusive IP Licenses granted to such Pledgor as of the date hereof. On and as of the date hereof, except as set forth in Schedule 5, collectively, the Pledgors own (a) all issued Patents and pending Patent applications issued by or filed listed in Schedule 5, (b) all registered Trademarks and Trademark applications registered by or filed listed in Schedule 5, (c) all registered Copyrights and Copyright applications pending listed in Schedule 5 and (d) all Licenses granting to a Pledgor any exclusive right with respect to any registered Copyright, Trademark or Patent owned by a third party ("**Exclusive IP Licenses**") listed in Schedule 5.

SECTION 6.3 No Violations or Proceedings. To the knowledge of each Pledgor, there is no violation, misappropriation, dilution or infringement by others of any right of such Pledgor with respect to any Intellectual Property Collateral. Such Pledgor is not infringing upon,

diluting, misappropriating or otherwise violating any Intellectual Property right of any other person.

SECTION 6.4Protection of Collateral Agent's Security. On a continuing basis, each Pledgor shall, at its sole cost and expense, (i) maintain and protect the Intellectual Property Collateral owned or used by such Pledgor, (ii) not permit to lapse or become abandoned any Intellectual Property Collateral owned or used by such Pledgor, and (iii) during the continuance of an Event of Default, upon prior notice from the Collateral Agent (acting at the direction the Required Holders or the Trustee acting at the direction of the Required Holders) to Issuer, (x) not enter into any settlement, covenant not to sue, or other agreement, in each case that would materially impair the validity or enforceability of any Intellectual Property Collateral owned or used by such Pledgor, or materially impair such Pledgor's ownership of any Intellectual Property Collateral owned or used by such Pledgor and (y) not permit to lapse or become abandoned any Intellectual Property Collateral owned or used by such Pledgor; provided, that, except with respect to clause (iii) above, nothing in this Agreement shall prevent any Pledgor from disposing of, discontinuing the use or maintenance of, failing to pursue or otherwise allowing to lapse, terminate or put into the public domain, any of its Intellectual Property, to the extent Issuer determines in good faith that such Intellectual Property is not Material IP Collateral. Upon the Collateral Agent's reasonable request, each Pledgor shall furnish to the Collateral Agent from time to time information further identifying and describing the Intellectual Property Collateral as the Collateral Agent may reasonably request, all in reasonable detail (it being understood that the Collateral Agent shall have no duty to make such request (other than pursuant to any direction given by the Trustee (acting at the direction of the Required Holders) or the Required Holders)).

SECTION 6.5After-Acquired Property. If any Pledgor, at any time before the satisfaction and discharge of the Indenture in accordance with Section 3.01 thereof, (i) obtains any rights to any additional Intellectual Property Collateral or (ii) becomes entitled to the benefit of any additional Intellectual Property Collateral or extension thereof, including any reissue, division, continuation, or continuation-in-part of any Intellectual Property Collateral, or any improvement on any Intellectual Property Collateral, the provisions hereof shall automatically apply thereto and any such item enumerated in clause (i) or (ii) of this sentence with respect to such Pledgor shall automatically constitute Intellectual Property Collateral if such would have constituted Intellectual Property Collateral at the time of execution hereof and be subject to the Lien and security interest created by this Agreement without further action by any party. Each Pledgor shall, at the time of filing of the quarterly and annual financial statements, with respect to any item of Intellectual Property Collateral owned by a Pledgor and any Exclusive IP Licenses, (i) promptly provide to the Collateral Agent written notice of each such item and (ii) promptly thereafter, file the instruments and documents provided for in Section 2.2(c) with respect to such item.

SECTION 6.6Litigation. Upon the occurrence and during the continuance of any Event of Default, to the extent permissible by law, the Collateral Agent, acting at the direction of the Required Holders, shall have the right , but shall in no way be obligated to file applications for protection of the Intellectual Property Collateral and/or bring suit in the name of any Pledgor, the Collateral Agent or the Secured Parties to enforce the Intellectual Property Collateral and any License thereunder. In the event of such suit, each Pledgor shall do any and all lawful acts and

execute any and all documents reasonably necessary in aid of such enforcement, and the Pledgors shall promptly reimburse and indemnify the Collateral Agent for all reasonable and documented costs and expenses incurred by the Collateral Agent in the exercise of its rights under this Section 6.6 in accordance with Section 10.06 of the Indenture. In the event that, upon the occurrence of and during the continuance of any Event of Default, the Collateral Agent does not bring such suit to enforce the Intellectual Property Collateral, each Pledgor agrees to take all reasonable actions, whether by suit, proceeding or other action, as such Pledgor, in its reasonable business judgment, deems necessary and appropriate to prevent the infringement, counterfeiting, unfair competition, dilution, misappropriation, diminution in value of or other damage to any Material IP Collateral by others and for that purpose agrees, subject to the foregoing qualifications, to diligently maintain any such suit, proceeding or other action to prevent such infringement, counterfeiting, unfair competition, dilution, misappropriation, diminution in value of or other damage to the Material IP Collateral owned by such Pledgor.

ARTICLE VII

MAINTENANCE OF RECORDS

SECTION 7.1 Each Pledgor shall, at such Pledgor's sole cost and expense, upon the Collateral Agent's demand (acting at the direction of the Trustee (acting at the direction of the Required Holders) or the Required Holders) made at any time after the occurrence and during the continuance of any Event of Default, deliver all tangible evidence of Accounts, including all documents evidencing Accounts and any books and records relating thereto to the Collateral Agent or to its representatives (copies of which evidence and books and records may be retained by such Pledgor). Upon the occurrence and during the continuance of any Event of Default, the Collateral Agent may (but shall not be obligated to) transfer a full and complete copy of such Pledgor's books, records, credit information, reports, memoranda and all other writings relating to the Accounts to and for the use by any person that has acquired or is contemplating acquisition of an interest in the Accounts or the Collateral Agent's security interest therein without the consent of any Pledgor; *provided*, that the Collateral Agent agrees to use reasonable efforts to provide prior written notice of any such transfer to such Pledgor.

ARTICLE VIII

REMEDIES

SECTION 8.1Remedies. Upon the occurrence and during the continuance of any Event of Default, the Collateral Agent may from time to time (but shall not be obligated to (other than pursuant to any direction given by the Trustee (acting at the direction of the Required Holders) or the Required Holders in accordance with the Indenture)) exercise in respect of the Pledged Collateral, in addition to the other rights and remedies provided for herein or otherwise available to it, the following remedies, in each case, to the fullest extent permitted by applicable law:

(i) Personally, or by agents or attorneys, immediately take possession of the Pledged Collateral or any part thereof, from any Pledgor or any other person who then has possession of any part thereof with or without notice or process of law, and for that purpose may enter upon any Pledgor's premises where any of the Pledged Collateral is located, remove such

Pledged Collateral, remain present at such premises to receive copies of all communications and remittances relating to the Pledged Collateral and use in connection with such removal and possession any and all services, supplies, aids and other facilities of any Pledgor;

(ii) Demand, sue for, collect or receive any money or Property at any time payable or receivable in respect of the Pledged Collateral including instructing the obligor or obligors on any agreement, instrument or other obligation constituting part of the Pledged Collateral to make any payment required by the terms of such agreement, instrument or other obligation directly to the Collateral Agent , and in connection with any of the foregoing, compromise, settle, extend the time for payment and make other modifications with respect thereto; *provided, however*, that in the event that any such payments are made directly to any Pledgor, such Pledgor shall promptly (but in no event later than three (3) Business Days after receipt thereof or such later date as may be agreed to in writing by the Collateral Agent) pay such amounts to the Collateral Agent ;

(iii)Sell, assign, grant a license to use or otherwise liquidate, or direct any Pledgor to sell, assign, grant a license to use or otherwise liquidate, any and all investments made in whole or in part with the Pledged Collateral or any part thereof, and take possession of the proceeds of any such sale, assignment, license or liquidation, with respect to licenses to Trademarks, subject to reasonable quality control provisions in connection with the goods and services offered under any Trademarks sufficient to avoid the risk of cancellation, voiding or invalidation of such Trademarks;

(iv)Take possession of the Pledged Collateral or any part thereof, by directing any Pledgor in writing to deliver the same to the Collateral Agent at any place or places so designated by the Collateral Agent, in which event such Pledgor shall at its own expense: (A) forthwith cause the same to be moved to the place or places designated by the Collateral Agent and therewith delivered to the Collateral Agent ; (B) store and keep any Pledged Collateral so delivered to the Collateral Agent at such place or places pending further action by the Collateral Agent ; and (C) while the Pledged Collateral shall be so stored and kept, provide such security and maintenance services as shall be necessary to protect the same and to preserve and maintain them in good condition. Each Pledgor's obligation to deliver the Pledged Collateral as contemplated in this Section 8.1(iv) is of the essence hereof. Upon application to a court of equity having jurisdiction, the Collateral Agent shall be entitled to a decree requiring specific performance by any Pledgor of such obligation;

(v) Retain and apply the Distributions to the Obligations as provided in Section 7.11 of the Indenture;

(vi)Exercise any and all rights as beneficial and legal owner of the Pledged Collateral subject to Section 5.1(ii); and

(vii)All the rights and remedies of a secured party upon default under the UCC (whether or not the UCC applies to the affected Pledged Collateral) or any other applicable law or in equity, and the Collateral Agent may also, at the direction of the Trustee or the Required Holders in accordance with the Indenture, without notice except as specified in Section 8.2, sell, assign, transfer or grant a license to use the Pledged Collateral or any part

thereof in one or more parcels at public or private sale, at any exchange, broker's board or at any of the Collateral Agent's offices or elsewhere, for cash, on credit or for future delivery, and at such price or prices and upon such other terms as the Collateral Agent, acting at the direction of the Required Holders, may deem commercially reasonable. The Collateral Agent , as agent for and representative of the Holders (but not any Holders or Holders in its or their respective individual capacities), (either directly or through one or more acquisition vehicles), upon instructions from Required Holders or any other Secured Party or any of their respective Affiliates may be the purchaser, licensee, assignee or recipient of any or all of the Pledged Collateral at any such sale and shall be entitled, for the purpose of bidding and making settlement or payment of the purchase price for all or any portion of the Pledged Collateral sold, assigned or licensed at such sale, to use and apply any of the Obligations (other than Obligations owing to the Trustee, the Collateral Agent or the Note Agents) owed to such person as a credit on account of the purchase price of any Pledged Collateral payable by such person at such sale. Each purchaser, assignee, licensee or recipient at any such sale shall acquire the Property sold, assigned or licensed absolutely free from any claim or right on the part of any Pledgor, and each Pledgor hereby waives, to the fullest extent permitted by applicable law, all rights of redemption, stay and/or appraisal that it now has or may at any time in the future have under any applicable law now existing or hereafter enacted. The Collateral Agent shall not be obligated to make any sale of Pledged Collateral regardless of notice of sale having been given. The Collateral Agent may adjourn any public or private sale from time to time by announcement at the time and place fixed therefor, and such sale may, without further notice, be made at the time and place to which it was so adjourned. Each Pledgor hereby waives, to the fullest extent permitted by applicable law, any claims against the Collateral Agent arising by reason of the fact that the price at which any Pledged Collateral may have been sold, assigned or licensed at such a private sale was less than the price which might have been obtained at a public sale, even if the Collateral Agent accepts the first offer received and does not offer such Pledged Collateral to more than one offeree.

SECTION 8.2Notice of Sale. Each Pledgor acknowledges and agrees that, to the extent notice of sale or other disposition of Pledged Collateral shall be required by any applicable law, 10 days' prior written notice to such Pledgor of the time and place of any public sale or of the time after which any private sale or other intended disposition is to take place shall be commercially reasonable notification of such matters. To the extent permitted by applicable law, no notification need be given to any Pledgor if it has signed, after the occurrence of an Event of Default, a statement renouncing or modifying any right to notification of sale or other intended disposition.

SECTION 8.3Waiver of Claims; Other Waivers; Marshalling.

(i) Each Pledgor hereby waives, to the fullest extent permitted by applicable law, notice of judicial hearing in connection with the Collateral Agent's taking possession or the Collateral Agent's disposition of any of the Pledged Collateral, including any and all prior notice and hearing for any prejudgment remedy or remedies and any such right which such Pledgor would otherwise have under any applicable law, and each Pledgor hereby further waives, to the fullest extent permitted by applicable law (i) all damages occasioned by such taking of possession, (ii) all other requirements as to the time, place and terms of sale or other requirements with respect to the enforcement of the Collateral Agent's rights hereunder

and (iii) all rights of redemption, appraisal, valuation, stay, extension or moratorium now or hereafter in force under any applicable law. The Collateral Agent shall not be liable for any incorrect or improper payment made pursuant to this Article VIII except to the extent resulting solely from the Collateral Agent's gross negligence or willful misconduct as determined in a final, non-appealable judgment by a court of competent jurisdiction. Any sale of, or the grant of options to purchase, or any other realization upon, any Pledged Collateral shall operate to divest all right, title, interest, claim and demand, either at law or in equity, of the applicable Pledgor therein and thereto, and shall be a perpetual bar both at law and in equity or otherwise against such Pledgor and against any and all persons claiming or attempting to claim the Pledged Collateral so sold, optioned or realized upon, or any part thereof, from, through or under such Pledgor.

(ii) To the maximum extent permitted by applicable law, each Pledgor hereby waives demand, notice (except for any notices required hereunder), protest, notice of acceptance of this Agreement, notice of Pledged Collateral received or delivered or any other action taken in reliance hereon.

(iii)The Collateral Agent shall not be required to marshal any present or future collateral security (including the Pledged Collateral) for, or other assurances of payment of, the Obligations or any of them or to resort to such collateral security or other assurances of payment in any particular order. To the maximum extent permitted by applicable law, each Pledgor hereby agrees that it will not invoke any applicable law relating to the marshalling of collateral and hereby irrevocably waives the benefits of all such applicable laws.

SECTION 8.4Standards for Exercising Rights and Remedies. To the extent that applicable laws impose duties on the Collateral Agent to exercise remedies in a commercially reasonable manner, each Pledgor acknowledges and agrees that it is commercially reasonable for the Collateral Agent (i) not to incur expenses reasonably deemed significant by the Collateral Agent to prepare Pledged Collateral for disposition or otherwise to fail to complete raw material or work in process into finished goods or other finished products for disposition, (ii) to fail to obtain third party consents for access to Pledged Collateral to be disposed of, or to obtain or, if not required by other applicable laws, to fail to obtain consents for governmental authorities or third parties for the collection or disposition of Pledged Collateral to be collected or disposed of, (iii) to fail to exercise collection remedies against account debtors or other persons obligated on Pledged Collateral or to fail to remove liens or encumbrances on or any adverse claims against Pledged Collateral, (iv) to exercise collection remedies against account debtors and other persons obligated on Pledged Collateral directly or through the use of collection agencies and other collection specialists, (v) to advertise dispositions of Pledged Collateral solely through publications or media of general circulation, whether or not the Pledged Collateral is of a specialized nature, (vi) to contact other persons, whether or not in the same business as any Pledgor, for expressions of interest in acquiring all or any portion of the Pledged Collateral, (vii) to hire one or more professional auctioneers of general experience to assist in the disposition of Pledged Collateral, whether or not the collateral is of a specialized nature, (viii) to dispose of Pledged Collateral by utilizing internet sites that provide for the auction of assets of the types included in the Pledged Collateral or that have the reasonable capability of doing so, or that match buyers and sellers of assets, (ix) to dispose of assets in wholesale rather than retail markets, (x) to disclaim or modify disposition warranties, (xi) to purchase insurance or credit

enhancements to insure the Collateral Agent against risks of loss, collection or disposition of Pledged Collateral or to provide to the Collateral Agent a guaranteed return from the collection or disposition of Pledged Collateral, or (xii) to the extent deemed appropriate by the Collateral Agent, to obtain the services of other brokers, investment bankers, consultants and other professionals to assist the Collateral Agent in the collection or disposition of any of the Pledged Collateral. The Pledgors acknowledge that the purpose of this Section 8.4 is to provide non-exhaustive indications of what actions or omissions by the Collateral Agent would fulfill the Collateral Agent's duties under the UCC or other applicable laws of the State or any other relevant jurisdiction in the Collateral Agent's exercise of remedies against the Pledged Collateral and that other actions or omissions by the Collateral Agent shall not be deemed to fail to fulfill such duties solely on account of not being indicated in this Section 8.4. Without limiting the foregoing, nothing contained in this Section 8.4 shall be construed to grant any rights to any Pledgor or to impose any duties on the Collateral Agent that would not have been granted or imposed by this Agreement or by applicable law in the absence of this Section 8.4.

SECTION 8.5Certain Sales of Pledged Collateral.

(i) Each Pledgor recognizes that, by reason of certain prohibitions contained in applicable law, the Collateral Agent may be compelled, with respect to any sale of all or any part of the Pledged Collateral, to limit purchasers to those who meet the requirements of a Governmental Authority. Each Pledgor acknowledges that any such sales may be at prices and on terms less favorable to the Collateral Agent than those obtainable through a public sale without such restrictions, and, notwithstanding such circumstances, agrees that any such restricted sale shall be deemed to have been made in a commercially reasonable manner and that, except as may be required by applicable law, the Collateral Agent shall have no obligation to engage in public sales.

(ii) Each Pledgor recognizes that, by reason of certain prohibitions contained in the Securities Act and applicable state or foreign securities' laws, the Collateral Agent may be compelled, with respect to any sale or disposition of all or any part of the Securities Collateral and Investment Property, to limit purchasers to persons who will agree, among other things, to acquire such Securities Collateral or Investment Property for their own account, for investment and not with a view to the distribution or resale thereof. Each Pledgor acknowledges that any such private sales may be at prices and on terms less favorable to the Collateral Agent than those obtainable through a public sale without such restrictions (including a public offering made pursuant to a registration statement under the Securities Act), and, notwithstanding such circumstances, agrees that any such private sale shall be deemed to have been made in a commercially reasonable manner and that the Collateral Agent shall have no obligation to engage in public sales and no obligation to delay the sale of any Securities Collateral or Investment Property for the period of time necessary to permit the issuer thereof to register it for a form of public sale requiring registration under the Securities Act or under applicable state or foreign securities laws, even if such issuer would agree to do so.

(iii)If the Collateral Agent (as directed by the Trustee (at the direction of the Required Holders) or the Required Holders) determines to exercise its right to sell any or all of the Securities Collateral or Investment Property after the occurrence and during the continuance of an Event of Default, upon written request, the applicable Pledgor shall, and shall

use commercially reasonable efforts to cause each issuer of Securities Collateral and Investment Property to be sold hereunder to, from time to time furnish to the Collateral Agent all such information as may be necessary or as the Collateral Agent may reasonably request to determine the number and nature or interest of securities or other instruments included in the Securities Collateral or Investment Property which may be sold as exempt transactions under the Securities Act and the rules of the Commission thereunder, as the same are from time to time in effect. Each Pledgor further agrees that a breach of any of the covenants contained in this Section 8.5(iii) will cause irreparable injury to the Collateral Agent and other Secured Parties, that the Collateral Agent and the other Secured Parties have no adequate remedy at law in respect of such breach and, as a consequence, that each and every covenant contained in this Section 8.5(iii) shall be specifically enforceable against such Pledgor, and such Pledgor hereby waives and agrees not to assert any defenses against an action for specific performance of such covenants, except for a defense that no Event of Default has occurred or is continuing or that the Obligations (other than contingent obligations and expense reimbursement not then due and payable) have been paid in full.

SECTION 8.6No Waiver; Cumulative Remedies.

(i) No failure on the part of the Collateral Agent to exercise, no course of dealing with respect to, and no delay on the part of the Collateral Agent in exercising, any right, power or remedy hereunder shall operate as a waiver thereof; nor shall any single or partial exercise of any such right, power or remedy hereunder preclude any other or further exercise thereof or the exercise of any other right, power or remedy; nor shall the Collateral Agent be required to look first to, enforce or exhaust any other security, collateral or guaranties. The remedies herein provided are cumulative and are not exclusive of any remedies provided by applicable law, in equity or otherwise.

(ii) In the event that the Collateral Agent shall have instituted any proceeding to enforce any right, power or remedy under this Agreement or any other Notes Document by foreclosure, sale, entry or otherwise, and such proceeding shall have been discontinued or abandoned for any reason or shall have been determined adversely to the Collateral Agent , then and in every such case, the Pledgors, the Collateral Agent and each other Secured Party shall be restored to their respective former positions and rights hereunder with respect to the Pledged Collateral, and all rights, remedies and powers of the Collateral Agent and the other Secured Parties shall continue as if no such proceeding had been instituted.

SECTION 8.7Certain Additional Actions Regarding Intellectual Property. If any Event of Default shall have occurred and be continuing, upon the reasonable written demand of the Collateral Agent , each Pledgor shall execute and deliver to the Collateral Agent an assignment or assignments of the registered Intellectual Property Collateral (and any applications therefor) or such other documents as are reasonably necessary (as determined by the Issuer in good faith) or reasonably requested by the Collateral Agent as so instructed to carry out the intent and purposes hereof.

ARTICLE IX

APPLICATION OF PROCEEDS

The proceeds received by the Collateral Agent in respect of any sale of, collection from, or other realization upon all or any part of the Pledged Collateral pursuant to the exercise by the Collateral Agent of its remedies shall, together with any other sums then held by the Collateral Agent, be applied in accordance with Section 7.11 of the Indenture.

ARTICLE X

MISCELLANEOUS

SECTION 10.1 Collateral Agent Appointed Attorney-in-Fact. Each Pledgor hereby appoints the Collateral Agent as its attorney-in-fact, with full power and authority in the place and stead of such Pledgor and in the name of such Pledgor, or otherwise, at the direction of the Trustee or the Required Holders in accordance with the Indenture, to take any action and to execute any instrument consistent with the terms of the Indenture, this Agreement and the other Notes Documents. The foregoing grant of authority is a power of attorney coupled with an interest and such appointment shall be irrevocable. Each Pledgor hereby ratifies all that such attorney shall lawfully do in accordance with the terms of this Agreement and the other Notes Documents and only to the extent permitted hereunder or thereunder. Notwithstanding anything in this Section 10.1 to the contrary, the Collateral Agent agrees that it will not exercise any rights under the power of attorney provided for in this Section 10.1 unless an Event of Default has occurred and is continuing.

SECTION 10.2 Continuing Security Interest. This Agreement shall create a continuing security interest in the Pledged Collateral and shall (i) be binding upon the Pledgors, their respective successors and assigns and (ii) inure, together with the rights and remedies of the Collateral Agent hereunder, to the benefit of the Collateral Agent and the other Secured Parties and each of their respective successors, transferees and permitted assigns. No other persons (including any other creditor of any Pledgor) shall have any interest herein or any right or benefit with respect hereto.

SECTION 10.3 Termination; Release. (a) This Agreement shall automatically terminate upon the satisfaction and discharge of the Indenture in accordance with Article 9 thereof. Upon termination hereof, the Lien granted hereby shall automatically terminate and all rights to the Pledged Collateral shall automatically revert to the applicable Pledgor or to such other person as may be entitled thereto pursuant to any Order or other applicable law. The Lien granted hereby shall be automatically released and shall automatically terminate with respect to all or any portion of the Pledged Collateral in accordance with Section 12.03 of the Indenture. A Pledgor shall automatically be released from its obligations hereunder if it ceases to be a Guarantor in accordance with the Indenture.

(a) In connection with any termination or release pursuant to paragraph (a) of this Section 10.3, so long as the Issuer shall have provided the Collateral Agent with such certifications or documents as required in Section 12.03 of the Indenture, including an Officer's

Certificate and Opinion of Counsel, the Collateral Agent shall execute and deliver to any Pledgor, at such Pledgor's expense, all documents that such Pledgor shall reasonably request to evidence such termination or release and shall perform such other actions reasonably requested by such Pledgor to effect such release, including delivery of certificates, securities and instruments, in each case, as prepared by such Pledgor, in form and substance satisfactory to the Collateral Agent, without representation, recourse or warranty.

SECTION 10.4Modification in Writing. No amendment, modification, supplement, termination or waiver of or to any provision hereof, nor consent to any departure by any Pledgor therefrom, shall be effective unless the same shall be made in accordance with the terms of the Indenture and unless in writing (including by electronic mail) and signed by the Collateral Agent and the applicable Pledgor. Any amendment, modification or supplement of or to any provision hereof, any waiver of any provision hereof and any consent to any departure by any Pledgor from the terms of any provision hereof shall be effective only in the specific instance and for the specific purpose for which made or given. Except where notice is specifically required by this Agreement, no notice to or demand on any Pledgor in any case shall entitle any Pledgor to any other or further notice or demand in similar or other circumstances.

SECTION 10.5Notices. Unless otherwise provided herein or in the Indenture, any notice or other communication herein required or permitted to be given shall be given in the manner and become effective as set forth in the Indenture, as to any Pledgor, addressed to it at the address of the Issuer set forth in the Indenture and as to the Collateral Agent , addressed to it at its Corporate Trust Office as set forth in the Indenture, or in each case at such other address as shall be designated by such party in a written notice (which, in the case of notice to the Collateral Agent , may be electronic mail) to the other party complying as to delivery with the terms of this Section 10.5.

SECTION 10.6Governing Law and Consent to Jurisdiction; Waiver of Jury Trial. The terms of Sections 11.06 and 11.07 of the Indenture with respect to governing law, consent of jurisdiction, service of process, venue and waiver of jury trial are incorporated herein by reference, *mutatis mutandis*, and the parties hereto agree to such terms.

SECTION 10.7Severability of Provisions. In the event any provision of this Agreement shall be invalid, illegal or unenforceable, then (to the extent permitted by law) the validity, legality or enforceability of the remaining provisions shall not in any way be affected or impaired.

SECTION 10.8Execution in Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be an original, but such counterparts shall together constitute but one and the same instrument. The exchange of copies of this Agreement and of signature pages by facsimile or PDF transmission shall constitute effective execution and delivery of this Agreement as to the parties hereto and may be used in lieu of the original Agreement for all purposes. Signatures of the parties hereto transmitted by facsimile or PDF shall be deemed to be their original signatures for all purposes. The words "delivery," "execution," "execute," "signed," "signature," and words of like import in or related to any document to be signed in connection with this Agreement and the transactions contemplated hereby shall be deemed to include electronic signatures, the electronic matching of assignment

terms and contract formations on electronic platforms approved by the Trustee and the Collateral Agent , or the keeping of records in electronic form, each of which shall be of the same legal effect, validity or enforceability as a manually executed signature, physical delivery thereof or the use of a paper-based recordkeeping system, as the case may be, to the extent and as provided for in any applicable law, including the Federal Electronic Signatures in Global and National Commerce Act, the New York State Electronic Signatures and Records Act, or any other similar state laws based on the Uniform Electronic Transactions Act. The Pledgors agree to assume all risks arising out of the use of digital signatures and electronic methods, including without limitation the risk of the Collateral Agent acting on unauthorized instructions, and the risk of interception and misuse by third parties.

SECTION 10.9Business Days. In the event any time period or any date provided in this Agreement ends or falls on a day other than a Business Day, then such time period shall be deemed to end and such date shall be deemed to fall on the next succeeding Business Day, and performance herein may be made on such Business Day, with the same force and effect as if made on such other day.

SECTION 10.10No Claims Against Collateral Agent . Nothing contained in this Agreement or any other Notes Document, nor the exercise by the Collateral Agent of any of the rights or remedies hereunder, shall constitute any consent or request by the Collateral Agent, express or implied, for the performance of any labor or services or the furnishing of any materials or other Property in respect of the Pledged Collateral or any part thereof, nor as giving any Pledgor any right, power or authority to contract for or permit the performance of any labor or services or the furnishing of any materials or other Property in such fashion as would permit the making of any claim against the Collateral Agent in respect thereof or any claim that any Lien based on the performance of such labor or services or the furnishing of any such materials or other Property is prior to the Lien hereof.

SECTION 10.11Obligations Absolute. All obligations of each Pledgor hereunder shall be absolute and unconditional irrespective of:

(i) any bankruptcy, insolvency, reorganization, arrangement, readjustment, composition, liquidation or the like of any Pledgor;

(ii) any lack of validity or enforceability of any Notes Document or any other agreement or instrument relating thereto against any Pledgor;

(iii)any change in the time, manner or place of payment of, or in any other term of, all or any of the Obligations, or any other amendment or waiver of or any consent to any departure from any Notes Document or any other agreement or instrument relating thereto (except, and only to the extent provided by, any amendment, waiver or consent executed in accordance with Article 8 of the Indenture which alters any such obligation hereunder);

(iv)any pledge, exchange, release or non-perfection or loss of priority of any other collateral, or any release thereto (except, and only to the extent provided by, any release executed in accordance with Section 10.3 hereof which alters any such obligation hereunder) or amendment or waiver of or consent to any departure from any guarantee thereto

(except, and only to the extent provided by, any amendment, waiver or consent executed in accordance with Article 8 of the Indenture which alters any such obligation hereunder), for all or any of the Obligations;

(v) any exercise, non-exercise or waiver of any right, remedy, power or privilege under or in respect hereof of any Notes Document; or

(vi)any other circumstances which might otherwise constitute a defense (other than the payment in full in cash of the Obligations (other than contingent obligations and expense reimbursement not yet due and payable)) available to, or a discharge of, the Pledgors.

SECTION 10.12Concerning the Collateral Agent .

(a) The powers conferred on the Collateral Agent hereunder are solely to protect the Secured Parties' interest in the Pledged Collateral and shall not impose any duty upon the Collateral Agent to exercise any such powers. Except for the safe custody of any Pledged Collateral in its possession and the accounting for moneys actually received by it hereunder, the Collateral Agent shall have no duty as to any Pledged Collateral, as to ascertaining or taking action with respect to any Pledged Collateral, whether or not any Secured Party has or is deemed to have knowledge of such matters, or as to the taking of any necessary steps to preserve rights against any parties or any other rights pertaining to any Pledged Collateral. The Collateral Agent shall be deemed to have exercised reasonable care in the custody and preservation of any Pledged Collateral in its possession if such Pledged Collateral is accorded treatment substantially equal to that which it accords property of similar customers.

(b) The Pledgors acknowledge that the rights and responsibilities of the Collateral Agent under this Agreement with respect to any action taken by the Collateral Agent or the exercise or non-exercise by the Collateral Agent of any option, voting right, request, judgment, discretion or other right or remedy provided for herein or resulting or arising out of this Agreement shall, as between the Collateral Agent and the other Secured Parties, be governed by the Indenture and by such other agreements with respect thereto as may exist from time to time among them. Notwithstanding anything herein to the contrary, whenever this Agreement provides for any action by, determination to be made by or discretion to be exercised by the Collateral Agent, the Collateral Agent may act or refrain from acting in accordance with the direction of Required Holders (accompanied by, if requested, indemnity satisfactory to the Collateral Agent) and in the absence of such direction and indemnity the Collateral Agent shall have no duty to act and no liability to any person for refraining from acting and, provided further, that any direction to the Collateral Agent referenced herein shall be understood to be a direction of the Required Holders or, if expressly required by the Indenture including, but not limited to, the limitations provided for in Section 12.02 of the Indenture, such group of Holders are set forth therein, and, in which case, which does not require the Collateral Agent to expend or risk its own funds or otherwise incur liability.

(c) GLAS Trust Company, LLC, is entering this Agreement not in its individual or corporate capacity, but solely in its capacity as Collateral Agent under the Indenture. In acting hereunder, the Collateral Agent shall be entitled to all of the rights,

privileges, benefits, immunities and indemnities of the Collateral Agent set forth in the Indenture, including without limitation those set forth in Articles 10 and 12 thereof, as if such rights, privileges, immunities and indemnities were expressly set forth herein. Notwithstanding anything contained herein to the contrary, unless directed in writing to do so by the Required Holders (or by the Trustee acting at the direction of the Required Holders), the Collateral Agent shall not have any duty to take any discretionary action (including, without limitation, deeming or making a determination that anything is satisfactory, approved, acceptable, selected or should be requested) or exercise any discretionary rights or powers. The Collateral Agent shall not have any liability for any delay in acting or failure to exercise any such discretionary action, right or power nor shall the Collateral Agent be obligated to act unless it has received indemnity and/or security satisfactory to it.

(d) The Collateral Agent shall have no duty or obligation to prepare or make any filings, recordings, re-filings or re-recordings of any financing statement, perfection statement, continuation statement or other instrument in any public office or for otherwise to perfect or maintain the perfection of the Collateral Agent's security interest in the Pledged Collateral.

(e) The Collateral Agent is authorized to enter into a customary intercreditor agreement (as attested by a duly authorized officer of the Issuer in a certificate delivered to the Collateral Agent) in connection with any debt secured by a lien permitted under the Indenture.

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IN WITNESS WHEREOF, the Pledgors and the Collateral Agent have caused this Agreement to be duly executed and delivered by their duly authorized officers as of the date first above written.

BIORA THERAPEUTICS, INC.,
as Pledgor

By: /s/ Eric d'Esparbes
Name: Eric d'Esparbes
Title: Chief Financial Officer

GLAS TRUST COMPANY LLC, not in its individual capacity but solely in its capacity as Collateral Agent

By: /s/ Katie Fischer
Name: Katie Fischer
Title: Vice President

Exhibit 21.1

Subsidiaries of Biora Therapeutics, Inc.

Biora Therapeutics UK Limited, a private limited company incorporated in the United Kingdom

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the registration statements (Nos. 333-246343, 333-263911, and 333-273511) on Form S-8, and in registration statements (Nos. 333-258301, 333-269446, and 333-276260) on Form S-3, and in registration statements (Nos. 333-254471 and 333-257187) on Form S-1 of our report dated April 1, 2024, with respect to the consolidated financial statements of Biora Therapeutics, Inc.

/s/ KPMG LLP

San Diego, California
April 1, 2024

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Aditya P. Mohanty, certify that:

1. I have reviewed this Annual Report on Form 10-K of Biora Therapeutics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: April 1, 2024

By: /s/ Aditya P. Mohanty

Aditya P. Mohanty, Chief Executive Officer
(principal executive officer)

Exhibit 31.2

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Eric d'Esparbes, certify that:

1. I have reviewed this Annual Report on Form 10-K of Biora Therapeutics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: April 1, 2024

By: /s/ Eric d'Esparbes

Eric d'Esparbes, Chief Financial Officer
(principal financial and accounting officer)

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Biora Therapeutics, Inc. (the "Company") for the year ended December 31, 2023 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned officers of the Company hereby certifies, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: April 1, 2024

By: /s/ Aditya P. Mohanty

Aditya P. Mohanty, Chief Executive Officer
(principal executive officer)

By: /s/ Eric d'Esparbes

Eric d'Esparbes, Chief Financial Officer
(principal financial and accounting officer)

The foregoing certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. §1350, and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

Note: A signed original of this written statement required by §906 has been provided to Biora Therapeutics, Inc. and will be retained by Biora Therapeutics, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.

Exhibit 97.1

BIORA THERAPEUTICS, INC.

COMPENSATION RECOUPMENT (CLAWBACK) POLICY

Recoupment of Incentive-Based Compensation

It is the policy of Biora Therapeutics, Inc. (the "Company") that, in the event the Company is required to prepare an accounting restatement of the Company's financial statements due to material non-compliance with any financial reporting requirement under the federal securities laws (including any such correction that is material to the previously issued financial statements, or that would result in a material misstatement if the error were corrected in the current period or left uncorrected in the current period), the Company will recover on a reasonably prompt basis the amount of any Incentive-Based Compensation Received by a Covered Executive during the Recovery Period that exceeds the amount that otherwise would have been Received had it been determined based on the restated financial statements.

Policy Administration and Definitions

This Policy is administered by the Compensation Committee (the "Committee") of the Company's Board of Directors, subject to ratification by the independent members of the Board of Directors with respect to application of this Policy to the Company's Chief Executive Officer, and is intended to comply with, and as applicable to be administered and interpreted consistent with, and subject to the exceptions set forth in, Listing Standard 5608 adopted by The Nasdaq Stock Market to implement Rule 10D-1 under the Securities Exchange Act of 1934, as amended (collectively, "Rule 10D-1").

For purposes of this Policy:

"Incentive-Based Compensation" means any compensation granted, earned, or vested based in whole or in part on the Company's attainment of a financial reporting measure that was Received by a person (i) on or after October 2, 2023 and after the person began service as a Covered Executive, and (ii) who served as a Covered Executive at any time during the performance period for the Incentive-Based Compensation. A financial reporting measure is (i) any measure that is determined and presented in accordance with the accounting principles used in preparing the Company's financial statements and any measure derived wholly or in part from such a measure, and (ii) any measure based in whole or in part on the Company's stock price or total shareholder return.

Incentive-Based Compensation is deemed to be "Received" in the fiscal period during which the relevant financial reporting measure is attained, regardless of when the compensation is actually paid or awarded.

"Covered Executive" means any "officer" of the Company as defined under Rule 16a-1(f) under the Securities Exchange Act of 1934, as amended.

"Recovery Period" means the three completed fiscal years immediately preceding the date that the Company is required to prepare the accounting restatement described in this Policy, all as determined pursuant to Rule 10D-1, and any transition period of less than nine months that is within or immediately following such three fiscal years.

If the Committee determines the amount of Incentive-Based Compensation Received by a Covered Executive during a Recovery Period exceeds the amount that would have been Received if determined or calculated based on the Company's restated financial results, such excess amount of Incentive-Based Compensation shall be subject to recoupment by the Company pursuant to this Policy. For Incentive-Based Compensation based on stock price or total shareholder return, where the amount of erroneously awarded compensation is not subject to mathematical

recalculation directly from the information in an accounting restatement, the Committee will determine the amount based on a reasonable estimate of the effect of the accounting restatement on the relevant stock price or total shareholder return. In all cases, the calculation of the excess amount of Incentive-Based Compensation to be recovered will be determined without regard to any taxes paid with respect to such compensation. The Company will maintain and will provide to The Nasdaq Stock Market documentation of all determinations and actions taken in complying with this Policy. Any determinations made by the Committee under this Policy shall be final and binding on all affected individuals.

The Company may effect any recovery pursuant to this Policy by requiring payment of such amount(s) to the Company, by set-off, by reducing future compensation, or by such other means or combination of means as the Committee determines to be appropriate. The Company need not recover the excess amount of Incentive-Based Compensation if and to the extent that the Committee determines that such recovery is impracticable, subject to and in accordance with any applicable exceptions under The NASDAQ Stock Market listing rules, and not required under Rule 10D-1, including if the Committee determines that the direct expense paid to a third party to assist in enforcing this Policy would exceed the amount to be recovered after making a reasonable attempt to recover such amounts. The Company is authorized to take appropriate steps to implement this Policy with respect to Incentive-Based Compensation arrangements with Covered Executives.

Any right of recoupment or recovery pursuant to this Policy is in addition to, and not in lieu of, any other remedies or rights of recoupment that may be available to the Company pursuant to the terms of any other policy, any employment agreement or plan or award terms, and any other legal remedies available to the Company; provided that the Company shall not recoup amounts pursuant to such other policy, terms or remedies to the extent it is recovered pursuant to this Policy. The Company shall not indemnify any Covered Executive against the loss of any Incentive-Based Compensation pursuant to this Policy.

Certification

All Covered Executives subject to this Policy will be required to certify their understanding of and intent to comply with this Policy periodically.

ACKNOWLEDGMENT AND CERTIFICATION

By signing below, the undersigned covered executive (the "Covered Executive") acknowledges and confirms that the Covered Executive has received and reviewed a copy of the Biora Therapeutics, Inc. (the "Company") Incentive Compensation Clawback Policy (the "Policy"), and in addition, the Covered Executive acknowledges and agrees that, for good and valid consideration, including continuing participation in the Company's incentive compensation programs, the receipt and sufficiency of which the Covered Executive hereby acknowledges, the Covered Executive will be bound by and abide by the Policy as follows:

(a) the Covered Executive is and will continue to be subject to the Policy and the Policy will apply both during and after the Covered Executive's employment with the Company;

(b) to the extent necessary to comply with the Policy, the Company hereby amends any employment agreement, equity award agreement or similar agreement that the Covered Executive is a party to with the Company;

(c) the Covered Executive shall abide by the terms of the Policy, including, without limitation, by returning any compensation to the Company to the extent required by, and in a manner permitted by, the Policy, and understands and agrees that the Company is not permitted to, and will not, indemnify the Covered Executive for the loss of any compensation that is subject to recovery by the Company;

(d) any amounts payable to the Covered Executive shall be subject to the Policy as may be in effect and interpreted or modified from time to time in the sole discretion of the Compensation Committee of the Company's Board of Directors (the "Committee") or as required by applicable law or the requirements of any securities exchange on which the Company's securities are listed, and that such interpretation or modification will be covered by this acknowledgment;

(e) the Company may recover compensation paid to the Covered Executive through any method of recovery the Committee or its delegate deems appropriate, including without limitation by reducing any amount that is or may become payable to the Covered Executive, and the Covered Executive agrees to comply with any request or demand for repayment by the Company in order to comply with the Policy; and

(f) the Company is not responsible for and shall not make the Covered Executive whole for any effect under any tax law or regulation of the recovery of any compensation pursuant to the Policy, or for any taxes paid by the Covered Executive on compensation that is subject to recovery or is recovered pursuant to the Policy.

_____
Signature

_____
Print Name

_____
Date