UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2021
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 001-37880

Novan, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**20-4427682**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
4020 Stirrup Creek Drive, Suite 110 **Durham, North Carolina**	**27703**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: **(919) 485-8080**

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, $0.0001 par value	**NOVN**	**The Nasdaq Stock Market LLC**

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	X	Smaller reporting company	X
		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. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No X

As of June 30, 2021, the last business day of the registrant's most recently completed second fiscal quarter, the aggregate market value of common stock held by non-affiliates of the registrant was approximately $188.2 million (based on a closing price of $10.06 per share as reported by the Nasdaq Capital Market on June 30, 2021). For purposes of this calculation, shares of common stock beneficially owned by the registrant's officers, directors and certain stockholders as of June 30, 2021 have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes. The registrant has no non-voting common equity.

The number of shares of registrant's common stock outstanding as of February 4, 2022 was 18,815,892.

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Forward-Looking Statements and Summary of Principal Risk Factors

This Annual Report on Form 10-K, or this Annual Report, contains forward-looking statements concerning our business, operations and financial performance and condition, as well as our plans, objectives and expectations. Any statements contained herein that are not statements of historical facts may be deemed to be forward-looking statements. These statements are often identified by the use of words such as "believe," "contemplate," "continue," "due," "goal," "objective," "plan," "seek," "target," "expect," "believe," "anticipate," "intend," "may," "will," "would," "could," "should," "potential," "predict," "project," or "estimate," and similar expressions or variations. These statements are based on the beliefs and assumptions of management based on information currently available to management. Forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Except as may be required by law, we undertake no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future. As a result, any or all of our forward-looking statements in this Annual Report may turn out to be inaccurate. Factors that may cause actual results to differ materially from current expectations include, among other things, those listed below and under the section entitled "Risk Factors" in this Annual Report and those discussed elsewhere in this Annual Report. These forward-looking statements speak only as of the date of this Annual Report.

The following summary briefly highlights the principal risks and uncertainties facing our business that could affect an investment in our common stock, which represent only a select portion of those risks. A more complete statement of those risks and uncertainties is set forth in the section entitled "Risk Factors" in this Annual Report. This summary is qualified in its entirety by that more complete statement.

- We have incurred net losses since our incorporation and anticipate that we will continue to incur net losses for the foreseeable future. We will need significant additional funding to continue our operating activities and for the advancement of our product development programs, including potential commercialization efforts, beyond what is currently included in our operating forecast and related cash projection. If we are unable to raise capital when needed, we would be forced to delay, reduce, terminate or eliminate our product development programs, or our commercialization efforts.

- Raising additional capital may reduce the trading price of our common stock. Our equity issuances during the year ended December 31, 2021 have resulted in significant dilution to our existing stockholders. Any future additional issuances of equity, or debt convertible into equity, may result in significant dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our technologies or product candidates.

- The price of our common stock may be volatile and fluctuate significantly, which could result in substantial losses for our existing stockholders.

- We have entered into and rely on, and may enter into, engage in and rely on other, strategic relationships and transactions for the further development and commercialization of our product candidates and the expansion of our business, and if we are unable to enter into such relationships or transactions on favorable terms or at all, or if such relationships or transactions are unsuccessful or if disputes arise between us and our strategic partners, we may be unable to realize the potential economic benefit of those relationships or transactions.

- We specialize solely in developing nitric oxide-based therapeutics to treat a range of diseases with significant unmet needs, and if we do not successfully achieve regulatory approval for any of our product candidates or successfully commercialize them, we may not be able to continue as a business. Clinical drug development involves a lengthy and expensive process with uncertain timelines and outcomes, and results of earlier studies and trials may not be predictive of future trial results. The results of any further development activities may not be sufficient to support a new drug application, or NDA, submission for any of our product candidates, or regulatory approval of our product candidates. Ongoing or future product development activities may not be successful, including in that our preclinical studies may not prove successful in demonstrating proof-of concept or may show adverse toxicological findings, and our clinical trials may not show the requisite safety and efficacy of our product candidates.

- The regulatory approval processes of the Food and Drug Administration, or the FDA, are lengthy, time-consuming and inherently unpredictable and have been and may be further disrupted by the COVID-19 pandemic, and if we are ultimately unable to obtain regulatory approval for our product candidates on a timely basis or at all, our business will be substantially harmed.

- Delays or disruptions in the qualification of manufacturing facilities and processes or in the manufacture of our (i) active pharmaceutical ingredients, or APIs, including NVN1000 or any other Nitricil™ new chemical entities, or NCEs, or (ii) clinical trial materials or commercial supplies of any approved product candidates, whether by us or any third-party manufacturer with whom we contract, including any delays in the upfit of our new facility under the New Lease (as defined below) or in the transfer of technology to third-party manufacturers, could adversely affect our development and commercialization timelines and result in increased costs of our development programs or in our breaching our obligations to others.

- We currently rely on third-party suppliers to provide the raw materials and equipment that are used by us or our third-party manufacturers in the manufacture of our product candidates. There are a limited number of suppliers for raw materials, including nitric oxide, and the equipment used to manufacture our product candidates. We currently rely on third-party logistics vendors to transport our raw materials, API, and drug products through our supply chain. Certain materials, including our API, have designated hazard classifications that limit available transportation modes or quantities. Any delay or disruption, especially in light of current global supply chain constraints, could adversely impact the timing or cost of our manufacturing activities or other associated development activities.

- We currently rely on third-party suppliers and the usage of third-party vendors to supply goods, materials and equipment in connection with our business, including in connection with the build-out of our new facility that we began to occupy in 2021. We expect to complete the build-out of our new facility to support various research and development and current good manufacturing practice, cGMP, activities, including small-scale manufacturing capabilities for API and drug product, by the end of the first quarter of 2022. We continue to assess global supply chain constraints, including any further impact of the COVID-19 pandemic, on our related suppliers and vendors. Any further delay or disruption could adversely impact the timing for completing the build-out of our new facility, which would cause us to rely solely on other third parties for any small-scale manufacturing or other research and development and cGMP activities.

- If we are unable to establish sales, marketing and distribution capabilities for our product candidates or any future product candidate that receives regulatory approval, either through a commercial partner or internally, we may not be successful in commercializing and generating potential revenues from those product candidates, if approved.

- We rely on third parties to conduct some of our preclinical studies, clinical trials, stability and analytical testing, and regulatory activities. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, or are adversely impacted by the COVID-19 pandemic, we may be unable to obtain regulatory approval for or commercialize any of our product candidates as planned or at all.

- Delay or termination of planned clinical trials for our product candidates would result in unplanned expenses and adversely impact our remaining developmental activities and potential commercial prospects with respect to, and ability to generate potential revenues from, such product candidates.

- We may expend our limited resources to pursue one or more product candidates or indications within our product development strategy, which may change over time, and thus fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

- Our product candidates may pose safety issues, cause adverse events, have side effects or have other properties that could delay or prevent their regulatory approval, limit the commercial profile of an approved label or result in significant negative consequences following marketing approval, if any.

- Our product candidates, if approved, will face significant competition, and our failure to effectively compete may prevent us from achieving significant market penetration.

- Changes to our leadership team or operational resources could prove disruptive to our operations and have adverse consequences for our business and operating results.

- If we are unable to obtain and maintain patent protection for our product candidates, or if the scope of the patent protection obtained is not sufficiently broad, our competitors could develop and commercialize technology and products similar or identical to ours, and our ability to successfully commercialize our technology and product candidates may be impaired.

PART I

Item 1. Business.

Overview

We are a pre-commercial nitric oxide-based pharmaceutical company focused on dermatology and anti-infective therapies. Our vision is to create the world's leader in nitric oxide-based science, technology, and clinical translation in support of delivering safe and efficacious therapies using our proprietary nitric oxide-based technology platform, Nitricil™, to generate macromolecular NCEs. Our proprietary technology platform leverages nitric oxide's naturally occurring anti-viral, anti-bacterial, anti-fungal, and immunomodulatory mechanisms of action to treat a range of diseases with significant unmet needs. Nitric oxide plays a vital role in the natural immune system response against microbial pathogens and is a critical regulator of inflammation. Our ability to harness nitric oxide and its multiple mechanisms of action has enabled us to create a platform with the potential to generate differentiated product candidates. The two key components of our nitric oxide platform are our proprietary Nitricil technology, which drives the creation of NCEs, and our formulation science, both of which we use to tune our product candidates for specific potential indications. Our ability to deploy nitric oxide in a solid form, on demand and in localized formulations allows us the potential to improve patient outcomes in a variety of diseases.

We have advanced strategic development programs in the field of dermatology, while also further expanding the platform into infectious diseases, men's and women's health, and various other medical conditions with significant unmet needs. This decision was based on the connection between the multi-factorial pathologies of diseases in these areas and the demonstrable anti-microbial, anti-viral and anti-inflammatory properties of Novan's nitric oxide technology.

We have clinical-stage dermatology and anti-infective drug candidates with multi-factorial (SB204), anti-viral (SB206), anti-fungal (SB208), and anti-inflammatory (SB414) mechanisms of action. We have also introduced a possible anti-viral product candidate for the treatment of external genital warts (SB207). We have conducted or are currently conducting preclinical work on NCEs, including berdazimer sodium, and formulations for the potential treatment of (i) SARS-CoV-2, the virus that causes COVID-19 (SB019); (ii) antimicrobial indications for the adjacent companion animal health market (NVN4100); (iii) cervical intraepithelial neoplasia caused by high-risk human papilloma virus in the men's and women's health field (WH504 and WH602); and (iv) inflammatory disorders.

We are currently focusing our efforts and resources on our priority development pipeline candidates, which include (i) progressing our lead program, SB206, as a treatment for molluscum contagiosum, or molluscum, including preparing for and seeking U.S. regulatory approval, and implementing prelaunch strategy and U.S. commercial preparation; (ii) advancing our late-stage product candidate, SB204, for the treatment of acne vulgaris, or acne, within the U.S., as our second lead program toward a registrational Phase 3 study, based on two prior Phase 3 studies; and (iii) progressing our SB019 development program into a Phase 1 study for a potential intranasal prophylaxis or therapeutic for mild-to-moderate COVID-19 infection.

During 2021, our primary programmatic focus was on our molluscum product candidate, SB206, and we intend to continue to focus our near term development efforts on this program. Following the positive top-line results from the B-SIMPLE4 trial announced in June 2021 and the comprehensive B-SIMPLE4 safety data announced in September 2021, we target a potential NDA submission of SB206 for molluscum no later than the fourth quarter of 2022. We previously articulated a targeted NDA submission of SB206 during the third quarter of 2022, however, due to factors including supply chain constraints, impacts of the COVID-19 pandemic, certain manufacturing related equipment issues and scheduling challenges, both within our corporate facility and with third-party contract manufacturing organizations, or CMOs, we have adjusted our expected timing accordingly.

Thus, we continue to prepare for a regulatory submission and potential approval of SB206 as a treatment for molluscum. The timing of the targeted NDA submission is dependent upon: (i) completion of our new manufacturing facility to have the infrastructure and capability necessary to produce cGMP API registration batches; (ii) continued technical transfer activities to our drug product CMO and preparing the necessary registration batches of drug product; (iii) preparatory activities and data accumulation related to the NDA submission including conducting customary drug substance and drug product stability protocols; and (iv) regulatory and quality documentation compilation related to our preclinical, clinical and chemistry, manufacturing and control, or CMC, data related to the B-SIMPLE trials, and our drug manufacturing and related processes.

We are continuing to consider and progress the prelaunch strategy and commercial preparations for SB206, if approved. We have selected Syneos Health, a fully integrated biopharmaceutical solutions organization, as our commercial solutions provider for SB206 as a treatment for molluscum. Our relationship with Syneos Health, structured as a fee-for-service arrangement, is focused on implementing the SB206 prelaunch strategy and commercial preparation, if approved by the FDA.

In September 2021, we also announced our updated strategic priorities and outlined potential key milestones. In addition to the regulatory progression of SB206, including implementing prelaunch strategy and commercial preparation, we also announced our intention to progress (a) SB204, a topical monotherapy for the treatment of acne, by (i) preparing for a pivotal Phase 3 study during 2022; (ii) targeting the conduct of a potential pivotal Phase 3 trial in 2023; and (iii) targeting a potential NDA submission of SB204 for acne in 2024; and (b) SB019, as a potential intranasal treatment option for COVID-19, by (i) targeting a Phase 1 study in healthy volunteers in 2022; (ii) targeting the conduct of a potential Phase 2/3 study(s) in 2023; and (iii) targeting a potential NDA submission of SB019 for COVID-19 in 2024. The progression of the SB019 program, subsequent to the execution of a Phase 1 study, and the progression of the SB204 program, including the execution of the potentially registrational SB204 Phase 3 trial, are subject to obtaining additional financing or strategic partnering.

Further advancement of our molluscum program beyond the potential NDA submission of SB206, or advancement of any other early-stage or late-stage clinical program across our platform, has been and may be further impacted by the COVID-19 pandemic and is subject to our ability to secure additional capital. Sources of additional capital may potentially include (i) equity or debt financings, including through sales of common stock to Aspire Capital Fund, LLC, or Aspire Capital, pursuant to the common stock purchase agreement that we entered into with Aspire Capital on July 21, 2020, or the July 2020 Aspire CSPA; or (ii) non-dilutive sources, such as partnerships, collaborations, licensing, grants or other strategic relationships. Our equity issuances during the year ended December 31, 2021, have resulted in significant dilution to our existing stockholders. Any issuance of equity, or debt convertible into equity, would result in further significant dilution to our existing stockholders.

Please refer to the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" in this Annual Report for further discussion regarding our current liquidity and our future funding needs in addition to the impact of the COVID-19 pandemic on our operations.

Technology

The Novan Nitric Oxide Platform

Nitric oxide is one of the most researched molecules in human physiology and has been extensively studied in many areas of medicine including in microbial diseases and in the modulation of inflammation. The scarcity of nitric oxide-based therapeutic products is due to the challenges associated with controlling the release of a gas, the poor stability and low storage capacity of nitric oxide-loaded molecules, the inability to target specific tissues, and the toxicity of several small molecules used as carriers to store nitric oxide.

The two key components of our nitric oxide platform are our proprietary Nitricil technology, which drives the creation of NCEs, and our formulation science, both of which we use to tune our product candidates for specific potential indications.

Novan's Nitricil technology enables us to store large amounts of nitric oxide gas in a stable, solid form by chemically loading it on a macromolecule, or polymer. The advantages of our proprietary Nitricil technology include tunability, stability, high storage capacity, targeted delivery, and what we believe is a favorable safety profile. Our ability to select from several nitric oxide-loaded materials has created our proprietary library of Nitricil compositions, each of which possesses a unique nitric oxide release profile.

Our formulation science and expertise allow us to customize the drug delivery method for the relevant anatomical location of a variety of diseases. With our potential dermatological indications, the topical semi-solid formulations enable us to further tune the release of nitric oxide when applied by using proprietary combinations of inactive ingredients. This additional level of control enables us to use one API for multiple potential therapeutic indications by altering the nitric oxide pharmacology with the composition of the topical formulation. This component of our nitric oxide platform creates an additional barrier to entry, which we believe would position us to prolong the period of market exclusivity for each of our product candidates, if approved.

We believe that our ability to deploy nitric oxide in a solid form, on demand and in localized formulations allows us the potential to improve patient outcomes in a variety of diseases.

Nitric Oxide Background

Nitric oxide, or NO, is a two-atom molecule that is produced naturally by the human body. Since the Nobel Prize-winning discovery in 1998 that nitric oxide is responsible for regulating blood flow, or vasodilation, the effects of nitric oxide have been extensively studied in many areas of physiology.

As a fundamental component in host defense against invading organisms, cells of the immune system naturally generate nitric oxide using the enzyme nitric oxide synthase, or NOS, and the amino acid precursor L-arginine. Nitric oxide is released in a targeted manner to kill microbial pathogens, including bacteria, fungi and viruses.

We believe that Novan's Nitricil technology has the potential to be a novel antimicrobial agent by delivering therapeutic quantities of nitric oxide and leveraging nitric oxide's multiple mechanisms of action and its ability as a gas to diffuse freely through cell membranes – unlike most other pharmaceutical agents. Importantly, the pharmacologic activity of nitric oxide is such that its production is localized at or near the site of infection. Because nitric oxide is a key component of the immune system's natural response to invading organisms, it may provide a therapeutic solution for degrading and killing microorganisms without the development of anti-microbial resistance.

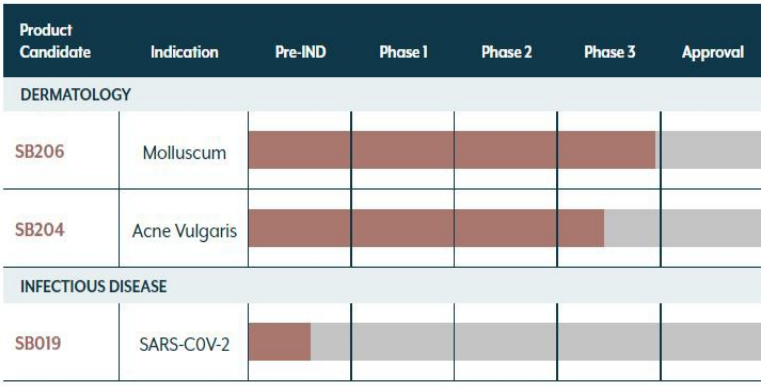
Nitric oxide and its multiple mechanisms of action have wide ranging possibilities to treat human disease. We believe that our expertise at developing nitric oxide-releasing NCEs and fine tuning the formulation technology to the targeted disease separates us from other drug development companies focused in this space. Nitric oxide is a naturally occurring chemical in the human body, which enhances its safety profile. The proven anti-microbial and anti-inflammatory effects of nitric oxide, combined with its naturally strong safety profile and our ability to capture and deliver effective doses, positions Novan with the potential to generate differentiated product candidates.

Priority Development Pipeline

We are currently focusing our efforts on our Priority Development Pipeline. We presently maintain exclusive, worldwide commercial rights for all product candidates currently in our pipeline, with the exception of the rights we have licensed to Sato Pharmaceutical Co., Ltd., or Sato, to develop, use and sell SB204 and SB206 in Japan.

Our priority development pipeline is currently positioned as shown in Figure 1 below.

Figure 1:



SB206, a Topical Anti-viral Treatment for Molluscum Contagiosum (a Viral Skin Infection)

We are developing SB206 (12% berdazimer sodium, 10.3% berdazimer) as a topical gel with anti-viral properties for the treatment of viral skin infections, with a current focus on molluscum contagiosum. Molluscum is a contagious skin infection caused by the molluscipoxvirus that affects up to six million people in the United States annually. The greatest incidence is in children aged one to 14 years. The average time to resolution is 13 months, however, 13% of children experience lesions that may not resolve in 24 months. There is no FDA-approved prescription drug treatment for molluscum. More than half of patients diagnosed with the infection are untreated. The majority of patients in the United States that receive treatment are treated with potentially painful procedures and the remaining are often prescribed products indicated for the treatment of external genital warts.

Based on the results of our initial Phase 3 trials for SB206 (referred to as B-SIMPLE1 and B-SIMPLE2), announced in January 2020, we held a Type C meeting with the FDA on April 1, 2020 seeking feedback on our proposal to conduct one additional, well-controlled pivotal study of SB206 to support a future NDA. Based on feedback, the FDA provided guidance indicating that the FDA would consider one additional pivotal trial, the B-SIMPLE4 Phase 3 trial, that, if successful, could be supported by the previously completed B-SIMPLE2 trial for a future NDA submission. In addition, the FDA provided guidance with regard to both the study design for the B-SIMPLE4 Phase 3 trial and expectations for a future NDA submission.

B-SIMPLE4 was designed as a multi-center, randomized, double-blind, vehicle-controlled study to evaluate the efficacy and safety of SB206 12% once daily that exceeded its enrollment target by randomizing 891 total patients (1:1 active:vehicle randomization),

ages 6 months and above, with molluscum, across 55 clinical sites. Patients were treated once-daily with SB206 12% or Vehicle Gel for a minimum of 4 weeks and up to 12 weeks to all treatable lesions (baseline and new). There were visits at Screening/Baseline, Week 2, Week 4, Week 8 and Week 12, and a safety follow-up at Week 24. As part of B-SIMPLE4's study design, we also implemented additional patient and caregiver training and patient engagement efforts and offered decentralized visit capabilities for conducting visits during the COVID-19 pandemic. The primary efficacy endpoint for B-SIMPLE4 was the proportion of patients achieving complete clearance of all treatable molluscum lesions at Week 12.

We initiated the B-SIMPLE4 trial in August 2020, the first patient was enrolled and dosed in September 2020, the trial completed patient enrollment during the first quarter of 2021 and the final patient completed their last Week-12 visit in late April 2021. We announced positive top-line efficacy and safety results on June 11, 2021. In the B-SIMPLE4 trial, 32.4% of patients experienced total clearance at Week 12 and 43.5% experienced total clearance or one remaining lesion at Week 12. B-SIMPLE4 achieved statistical significance for the primary endpoint with a p-value less than 0.0001. B-SIMPLE4 also achieved statistical significance for all secondary endpoints. P-value is a conventional statistical method for measuring the statistical significance of clinical results. A p-value of less than 0.050 is generally considered to represent statistical significance, meaning there is less than five percent likelihood that the observed results occurred by chance. We announced the B-SIMPLE4 trial's last patient visit in late July 2021 and the final safety profile through Week 24 was released in the third quarter of 2021. The comprehensive safety data readout demonstrated a favorable safety profile, consistent with previous studies and met our expectations. Based on these data, we believe that SB206, if approved, could provide a powerful treatment option for children and adults with molluscum. We are targeting a potential NDA submission of SB206 for molluscum no later than the fourth quarter of 2022 and are preparing for regulatory filing and potential approval of SB206 as a treatment for molluscum. Additionally, we received notice that the FDA has conditionally accepted Kinsolus™ as the brand name for SB206, if approved.

Amended Sato Agreement

In 2018, we licensed rights to Sato Pharmaceutical Co., Ltd., or Sato, to develop, use, and sell SB206 in certain topical dosage forms in Japan for the treatment of viral skin infections, and to manufacture the finished form of SB206 for sale in Japan, which are in addition to the rights granted to Sato related to SB204 for the treatment of acne vulgaris. The significant terms and the related accounting considerations of our licensing arrangement with Sato are further described in "Note 4—Licensing Arrangements" to the accompanying consolidated financial statements.

In April 2020, Sato informed us of its intention to progress the SB206 development program in Japan with a Phase 1 clinical trial given the observed treatment benefit and favorable safety profile in the B-SIMPLE program. In November of 2020, Sato determined its initial Japanese Phase 1 study for SB206 would require an amended design, including evaluation of potential lower dose strengths, to further refine dose tolerability in a subsequent Phase 1 study. In the fourth quarter of 2020 we concluded that a prospective delay in Sato's overall SB206 development plan had occurred and we estimated the program timeline to be extended by 1.75 years from our previous estimate, and a corresponding extension of the performance period estimate to 9.25 years, completing in the second quarter of 2026.

In late July 2021, Sato communicated an updated plan regarding its amended design for its additional Japanese Phase 1 study for SB206. The amended study design includes evaluation of potential lower dose strengths, including potential further refinement in a subsequent dose tolerability study. As part of the communication regarding these Phase 1 studies, Sato also communicated an updated comprehensive timeline for the Japanese SB206 program. The updated timeline assumes that the 12% formulation is appropriate to proceed for development in Japan and is to be reassessed based on the findings of the Phase 1 study.

Based upon (i) the expected timing of the additional Phase 1 study; (ii) Sato's estimated comprehensive developmental schedule for SB206, including additional post-Phase 1 clinical trials; and (iii) current and future Japanese clinical trial material manufacturing and technical transfer considerations, including the manufacturing site for drug product, we concluded that a prospective delay in Sato's overall SB206 Japanese development plan had occurred in July 2021. We estimate the program timeline to be extended by 0.75 years from our previous estimate, and a corresponding extension of the performance period estimate to 10 years, completing in the first quarter of 2027. We understand that the progression of the Japanese SB204 program could follow the same timeline as the Japanese SB206 program, subject to the nature of the results of Sato's comprehensive asset developmental program, including SB206.

In early January 2022, Sato communicated its decision to progress with the 12% formulation in its Phase 1 study, rather than lower dose strengths. Therefore, the most recent estimated development timeline remains reasonable, and continues to be subject to prospective reassessment and adjustment based upon Sato's interaction with the Japanese regulatory authorities and other developmental and timing considerations. The details of this development are further described in "Note 5—Revenue Recognition" to the accompanying consolidated financial statements.

SB204, for the Treatment of Acne Vulgaris

SB204 is a product candidate designed as a once-daily, topical monotherapy for the treatment of acne vulgaris, a multi-factorial disease with multiple aspects of the disease pathology (immunomodulatory and anti-bacterial). Acne vulgaris is the most common skin condition in the United States. The disease ranges in severity from mild to severe cystic acne and causes both physical and psychological effects, including permanent scarring, anxiety, depression and poor self-esteem. Acne is a multi-factorial disease with several mechanistic contributors to the disease pathology, often requiring multiple treatments that address more than one of the major causes of acne pathogenesis. Localized nitric oxide delivery may provide immunomodulatory (anti-inflammatory) and anti-bacterial mechanisms of action from a single active ingredient.

We believe that acne continues to be characterized as an unmet medical need due to the difficulty of balancing efficacy, systemic safety and cutaneous tolerability, as well as the growing concerns with anti-bacterial resistance with existing therapies. In our SB204 clinical development program, topical application of SB204 has been well-tolerated with no significant safety concerns identified. In maximal-use pharmacokinetic trials that we have conducted in adult and pediatric patients with acne vulgaris, we observed no detectable systemic exposure from SB204 following its topical application.

In the first quarter of 2017, we reported top-line results from two identically designed Phase 3 pivotal clinical trials for SB204. SB204 demonstrated statistical significance compared to vehicle on all three co-primary endpoints in one of the trials but demonstrated statistical significance on only one of three co-primary endpoints in the other trial. We conducted an in-depth examination of the full data sets from these trials, including post hoc analyses in pooled and sub populations, with extensive assistance from third-party expert consultants in biostatistics and regulatory affairs. In mid-2017 we completed our 40-week long term safety trial in eligible patients with acne who had previously completed 12 weeks of treatment in the related Phase 3 pivotal trials of SB204. No serious adverse events were observed with over 400 patients followed for six months and over 200 patients followed for one year.

We have had several interactions with the FDA since mid-2017 regarding SB204 and the acne indication. In September 2017, we conducted a guidance meeting with the FDA to obtain clinical and regulatory guidance by reviewing the previously completed parallel Phase 3 pivotal trials in patients with moderate-to-severe acne. The FDA's specific feedback noted that there were no additional safety requirements and that one additional pivotal trial, in moderate-to-severe acne, would be required for submission of an NDA. In the third quarter of 2018, the FDA provided feedback on two potential paths forward for the acne indication, confirming the need for one additional pivotal trial for moderate-to-severe acne patients prior to an NDA submission.

Based on the recent positive pivotal Phase 3 results in the SB206 molluscum development program, we believe we can optimize the trial design of a pivotal Phase 3 study for SB204 that has the potential to serve as a second pivotal trial to support an NDA submission. As such, we plan to prepare for a pivotal Phase 3 study during 2022; target the conduct of a potential pivotal Phase 3 trial in 2023, subject to obtaining additional financing or strategic partnering; and target a potential NDA submission of SB204 for acne in 2024.

In January 2017, we licensed rights to Sato to develop, use, and sell SB204 in certain topical dosage forms in Japan for the treatment of acne vulgaris, and to manufacture the finished form of SB204 for sale in Japan. The significant terms and the related accounting considerations of our licensing arrangement with Sato are further described in "Note 4—Licensing Arrangements" to the accompanying consolidated financial statements. For further information regarding the current status of the Japanese SB204 program see "Note 5—Revenue Recognition" to the accompanying consolidated financial statements.

SB019, an intranasal treatment option for Coronaviridae (COVID-19)

We continue to explore the use of our proprietary Nitricil technology to progress SB019, a potential intranasal treatment option for COVID-19, targeting the reduction of viral shedding and transmission. Nitric oxide has generally demonstrated the ability to inhibit viral replication of viruses within the *Coronaviridae* family, and we have an extensive body of *in vitro* and *in vivo* data demonstrating the efficacy of our proprietary technology for other anti-viral indications. Based on the scientific literature and data available to-date related to berdazimer sodium and SB206, we believe that nitric oxide may inhibit viral replication by disrupting protein function critical for viral replication and infection through generation of reactive intermediates.

In October 2020, we announced positive *in vitro* results showing the potential efficacy of our Nitricil platform technology, berdazimer sodium (NVN1000), as an anti-viral against SARS-CoV-2, the virus that causes COVID-19. To evaluate the ability of our Nitricil platform technology as a potential nasal treatment option for COVID-19, we initiated *in vitro* assessments targeting the reduction of viral burden in differentiated normal human bronchial epithelial cells. The studies were conducted at the Institute for Antiviral Research at Utah State University, and these results demonstrate the first instance of an anti-viral effect from a nitric oxide-based medicine in a 3-D tissue model that has similar structure to the human airway epithelium. The results from the *in vitro*

assessment of concentrations as low as 0.75 mg/mL demonstrated that berdazimer sodium reduced 90% of the virus after repeat dosing, once daily.

In December 2020, we entered into a Master Services Agreement with Catalent, Inc., a leading global provider of integrated services, delivery technologies and manufacturing solutions, relating to our COVID-19 program. This agreement includes work to support CMC activities and development of an intranasal formulation of berdazimer sodium for use in that program.

To further evaluate the potential of our Nitricil platform technology as an intranasal treatment option for COVID-19, we initiated preliminary preclinical *in vivo* studies to evaluate the efficacy of berdazimer sodium in reducing viral burden in infected animals and to deter viral transmission to uninfected animals.

In June 2021, we announced positive results from two separate studies that independently demonstrated the ability of berdazimer sodium to prevent progression of infection into the lungs after transmission, significantly limiting severity of disease in this model. The intranasal treatment was well-tolerated during these studies, and no treatment-related adverse effects were observed.

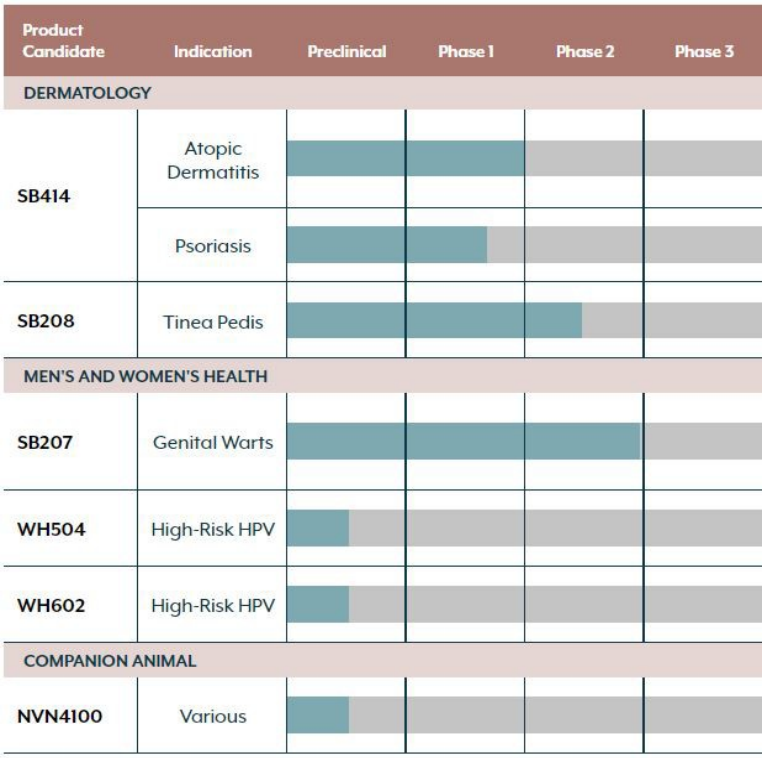
In November 2021, we announced favorable results of a Good Laboratory Practices, or GLP, 14-day repeat dose intranasal study. The preclinical safety data indicated that intranasal administration of SB019 formulation is well tolerated and safe. The GLP study evaluated repeated dosing with the SB019 product candidate (i.e., 5 times daily) for a period of 14 days and concluded with a 7-day recovery period without drug exposure. There were no treatment-related adverse events up to the highest dose tested of 14 mg/day berdazimer sodium, and the SB019 formulation was concluded to be well-tolerated under the conditions of this study.

Based on the positive preclinical and clinical data demonstrating anti-viral effect of berdazimer sodium against multiple viruses, as well as the public health need to reduce breakthrough infections and transmission, we plan to advance our SB019 product candidate. Pre-investigational new drug, or IND, application activities are underway with a target of an IND submission in 2022. Subject to regulatory guidance, our targeted timeline includes (i) initiating a Phase 1 study in healthy volunteers in 2022; (ii) conducting a potential Phase 2/3 study(s) in 2023, subject to obtaining additional financing or strategic partnering; and (iii) a potential NDA submission of SB019 for COVID-19 in 2024.

Pipeline Expansion Opportunities

Our pipeline expansion opportunities are currently positioned as shown in Figure 2 below.

Figure 2:



SB414, for the Treatment of Inflammatory Skin Diseases, including Atopic Dermatitis and Psoriasis

SB414 is a product candidate designed as a topical cream for the treatment of inflammatory skin diseases, with a focus on the treatment of atopic dermatitis and psoriasis. In 2018, we completed two complementary Phase 1b clinical trials with SB414 in patients with atopic dermatitis and psoriasis. The design of these complementary trials was to evaluate the safety, tolerability and pharmacokinetics of SB414. The trials were also designed to assess pharmacodynamics and specific target engagement through a reduction of key inflammatory biomarkers.

Atopic Dermatitis

We initiated a Phase 1b trial with SB414 in adults with mild-to-moderate atopic dermatitis in December 2017. In the Phase 1b trial, 48 adults with mild-to-moderate atopic dermatitis, with up to 30% body surface area at baseline, were randomized to receive one of 2% SB414 cream, 6% SB414 cream, or vehicle, twice daily for two weeks. In the complementary Phase 1b trial for mild-to-moderate chronic plaque psoriasis, 36 adults received SB414 6% cream or vehicle twice daily for four weeks.

We received and analyzed the preliminary top-line results from the Phase 1b clinical trials during the second and third quarters of 2018. In the atopic dermatitis trial, biomarkers from the Th2, Th17 and Th22 inflammatory pathways known to be highly relevant and indicative of atopic dermatitis, including Interleukin-13, or IL-13, IL-4R, IL-5, IL-17A and IL-22, were downregulated after two weeks of treatment with SB414 2%. The changes in Th2 and Th22 biomarkers and clinical efficacy assessed as the percent change in Eczema Area Severity Index scores were highly correlated in the SB414 2% group. Additionally, the proportion of patients achieving a greater than or equal to 3-point improvement on the pruritus (itch) numeric rating scale after two weeks of treatment was greater for patients treated with SB414 2% compared to patients treated with vehicle.

The 2% or 6% doses of SB414 in the trial did not result in any serious adverse events, and SB414 2% was more tolerable with no patients discontinuing treatment in the trial due to application site reactions. SB414 at the 6% dose was not consistently effective in reducing biomarkers across both the atopic dermatitis and psoriasis trials. This lack of consistent biomarker movement could potentially be explained by the increased irritation score experienced by patients treated with SB414 6%. SB414 6% showed detectable systemic exposure in a subset of patients, which cleared in nearly all affected patients within 12 hours, in both the atopic dermatitis and psoriasis trials. Given the successful downregulation of key biomarkers, favorable tolerability and unquantifiable systemic exposure with SB414 2%, we conducted non-clinical studies and completed our Phase 2 clinical development plan during 2019 to support a potential future Phase 2 clinical program launch. The SB414 program is currently on hold with further advancement subject to obtaining additional financing or strategic partnering.

Psoriasis

We initiated clinical development of SB414, our first use of our nitric oxide platform in the field of immunology, by dosing the first patient in October 2017 in a Phase 1b clinical trial to evaluate SB414 as a cream for the treatment of psoriasis. In the Phase 1b trial for mild-to-moderate chronic plaque psoriasis, 36 adults received SB414 6% cream or vehicle twice daily for four weeks. SB414 at the 6% dose did not result in any serious adverse events, but SB414 at the 6% dose was not consistently effective in reducing biomarkers across the trial. This lack of consistent biomarker movement could potentially be explained by the increased irritation score experienced by patients treated with SB414 6%. SB414 6% showed detectable systemic exposure in a subset of patients, which cleared in nearly all affected patients within 12 hours. Based on the results of the Phase 1b trial in psoriasis, we could potentially explore the use of lower doses of SB414 in psoriasis, subject to obtaining additional financing or strategic partnering.

SB208, for the Treatment of Athlete's Foot (Tinea Pedis) and Fungal Nail Infections (Onychomycosis)

SB208 is a product candidate designed as a topical broad-spectrum anti-fungal gel for the potential treatment of fungal infections of the skin and nails, including athlete's foot (tinea pedis) and fungal nail infections (onychomycosis). Studies have demonstrated enhanced efficacy when tinea pedis and onychomycosis are treated concurrently, suggesting that an effective topical treatment, suitable for simultaneous application to the nail plate and skin, may lead to lower rates of recurrence and enhanced efficacy.
We conducted a Phase 2 proof-of-concept trial in patients with clinical signs and symptoms of tinea pedis and announced top-line results in the second quarter of 2017. SB208 demonstrated a statistically significant effect compared to vehicle in (i) the primary endpoint of achieving negative fungal culture at day 14; and (ii) the secondary endpoint of achieving mycological cure at day 14 (mycological cure is defined by having a negative laboratory culture and negative fungal clinical diagnosis). At the end of a 4-week post treatment follow-up period, mycological cure was maintained at day 42 in both dose groups.

We conducted a Phase 1, single-center, double-blinded, randomized clinical trial in 32 adult females to evaluate the rate of fingernail growth associated with SB208 16% cream and the local tolerability of the gel when used over the course of 29 days. SB208 16% cream demonstrated a statistically significant greater mean daily nail growth rate for the treatment period when compared to the same patient's own growth rate in the run-in period and was well tolerated by patients.
The SB208 program is currently on hold with further advancement subject to obtaining additional financing or strategic partnering.

SB207, for the Treatment of External Genital Warts

Genital warts are among the world's most common sexually transmitted diseases. We have previously evaluated SB206's anti-viral activity in a Phase 2 randomized, double-blinded, vehicle-controlled clinical trial in 107 patients with genital warts caused by HPV. We announced top-line results from this Phase 2 clinical trial in the fourth quarter of 2016. SB206 demonstrated statistically significant results in the clearance of external genital and perianal warts. Once-daily treatment arms were generally well-tolerated, including the most effective dose, SB206 12% once-daily. With the full results from this Phase 2 trial made available, a Type B meeting was held with the FDA in the second quarter of 2017 with minutes received shortly thereafter.

In response to our identification of targeted viral opportunities of high unmet need where we believe our nitric oxide releasing technology could provide clinical benefit to patients, we developed SB207, a new anti-viral product candidate for the treatment of external genital warts. The SB207 product candidate incorporates our existing drug substance, berdazimer sodium (NVN1000), including the nitric oxide release profile of SB206, in a new formulation specifically tailored for external genital warts. Following the FDA's December 2019 feedback from a pre-IND meeting request with the FDA, we have determined that further advancement of SB207 is subject to further evaluation of clinical plans and developmental timelines, as well as obtaining additional financing or strategic partnering.

Advancement in Men's and Women's Health

In February 2020, following the successful progression of a Phase 1 grant received in August 2019, we were awarded a Phase 2 federal grant of approximately $1.0 million from the National Institute of Health, or NIH, that will enable the conduct of IND-

enabling toxicology and pharmacology studies and other preclinical activity of a nitric oxide containing intravaginal gel (WH602) designed to treat high-risk HPV infections that can lead to cervical intraepithelial neoplasias, or CIN. In March 2021, we were awarded additional funding of $0.1 million as part of this Phase 2 grant. Under the terms of the aforementioned NIH grant, we are entitled to receive the grant funds in the form of periodic reimbursements of our allowable direct expenses, allocated overhead, general and administrative expenses and payment of other specified amounts.

This product candidate, in addition to a non-gel formulation product candidate (WH504) supported by a federal grant from the U.S. Department of Defense's, or DoD, Congressionally Directed Medical Research Programs, or CDMRP, currently in development, together represent the core of our Men's and Women's Health business unit. This unit has continued to be supported through a collaboration with Health Decisions, Inc., or Health Decisions, a Premier Research company.

Companion Animal Health

We have initiated exploratory work to evaluate our new chemical entity, NVN4100, as a potential product candidate for antimicrobial indications in companion animal health. On June 7, 2021, we announced positive proof-of-concept *in vitro* results and informative *in vivo* results with NVN4100. This program is currently on hold, pending the engagement of potential collaborators or strategic partners to progress this asset, including the conduct of additional studies and formulation work.

Competition

The biotechnology and pharmaceutical industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. We consider our primary potential competition to be a broad base of existing providers and drug developers of therapeutics in the field of dermatology, specifically related to treatments for molluscum and acne vulgaris.
Additional providers and drug developers will become primary potential competition as we expand our platform to include infectious diseases, companion animal health, and men's and women's health therapeutic areas. Product competition includes pharmaceutical generics, branded generics, pharmaceutical brands, biologics as well as over-the-counter, or OTC, products.

We expect continued future competition across research and drug development in various different fields of innovation; capital and resource allocation to many of these areas appears to be continuous and of a global nature. In addition, there are certain instances where competition extends into the medical procedure and the medical device spectrums of human health care. Any product candidates that we successfully develop and commercialize will compete with these existing therapies as well as new therapies that may become available in the future. Our success will be based in part on our ability to identify, develop and manage a portfolio of product candidates that are safer and more effective than competing products and therapies.

Intellectual Property

Our success depends in large part upon our ability to obtain and maintain proprietary protection for our product candidates and technologies and to operate without infringing the proprietary rights of others. We seek to avoid the latter by monitoring patents and publications that may affect our business, and to the extent we identify such developments, evaluating and taking appropriate courses of action. With respect to the former, our policy is to protect our proprietary position by, among other methods, filing for patent applications on inventions that are important to the development and conduct of our business with the United States Patent and Trademark Office, or USPTO, and its foreign counterparts. We also use other forms of protection, such as trademark, copyright and trade secret protection, to protect our intellectual property, particularly where we do not believe patent protection is appropriate or obtainable.

We own or have an exclusive license to issued patents and pending patent applications in the United States and in foreign jurisdictions (including applications filed in foreign jurisdictions and international or Patent Cooperation Treaty, or PCT, applications that have not yet entered national phase). Patent coverage lasts for varying periods according to the date of filing of the patent application or the date of grant or issuance of the patent and the legal term of patents in various countries where patent protection is obtained. Generally, patents issued for regularly filed applications in the United States are granted a term of 20 years from the earliest filing date of a non-provisional patent application. In addition, in certain instances, the term of a patent can be extended to recapture a portion of the USPTO delay in issuing the patent or may be shortened if a patent is terminally disclaimed over another patent that expires earlier. The term of a patent may also be eligible for patent term extension to recapture a portion of the term effectively lost as a result of the FDA regulatory review period. However, as to the FDA component, the extension term cannot be longer than five years and the total patent term including the restoration period must not exceed 14 years following FDA approval. The duration of foreign patents varies in accordance with provisions of applicable local law, but typically is also 20 years from the earliest filing date of a non-provisional patent application. However, the actual protection afforded by a patent varies on a product by product basis from country to country and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country and the validity and enforceability of the patent.

Nitricil Technology

We exclusively license from the University of North Carolina at Chapel Hill, or UNC, issued patents and pending applications directed to our library of Nitricil compounds, including patents issued in the United States, Canada, Italy, Great Britain, France, Ireland, Germany, Finland, Spain, Sweden, Switzerland, Japan and Australia with claims intended to cover NVN1000, the NCE for our current clinical-stage product candidates. Additionally, one such issued patent in the United States has claims specifically directed to the composition of matter of NVN1000. These patents and pending applications, if issued, are projected to expire in 2026 without taking into account any patent term extensions that may be available to us. Additionally, NVN1000 has been classified as an NCE, and patent term extensions may be available to extend the life of a United States patent that covers NVN1000 beyond 2026. We also own patents issued in the United States, China, Germany, Spain, France, Great Britain, Ireland, Italy and Switzerland directed to methods of manufacturing Nitricil compounds. These patents are projected to expire in 2032.

Formulation Science and Therapeutic Uses

We own patents issued in the United States, Australia, Germany, Spain, France, Great Britain, Ireland, Italy, China, Mexico, South Korea, Brazil, Canada, and Japan directed to methods of reducing sebum production using nitric oxide-releasing macromolecules, including, in certain embodiments, through the use of Nitricil compounds. We also own issued patents in the United States, Australia, Germany, Spain, Great Britain, Italy, Finland, France, and Japan and pending applications filed in the United States, Brazil, Canada, China, Europe and Japan directed to the alcohol gel component of SB204 and SB206 and/or the SB204 and SB206 two-component formulations. We own patents issued in the United States, Australia, Germany, Spain, France, Italy, Great Britain, and Japan and are pursuing patent applications in the United States, Brazil, Canada, China, Europe and South Korea directed to the use of nitric oxide-releasing compounds, including, in certain embodiments, Nitricil compounds, for the treatment of viral skin infections.

Altogether, our issued United States and foreign patents and pending United States and foreign patent applications, if issued, relating to one or more of our clinical-stage product candidates are projected to expire between 2026 and 2037, without taking into account any patent term extensions that may be available to us and assuming that prosecution is pursued to issuance with no shortening of term.

Other Patented Technology

In addition to the patents and pending applications we own or have an exclusive license related to Nitricil compounds and our product candidates, we also own or have exclusive licenses to issued patents and pending applications in the United States and in foreign jurisdictions covering other nitric oxide-based therapeutics and/or methods of use in indications for dermatological and oncovirus-mediated diseases.

Trade Secrets

We rely upon trade secrets and know-how and continuing technological innovation to develop and maintain our competitive position. We seek to protect our proprietary information by limiting access to such information on a need-to-know basis exclusively. In addition, we seek to protect our proprietary information, in part, by requiring our employees, consultants, contractors and other advisors to execute nondisclosure and assignment of invention agreements, or to include such provisions in their consulting agreement, upon commencement of their respective employment or engagement. These agreements are designed to protect our proprietary information and, in the case of the invention assignment agreements and provisions, to grant us ownership of technologies that are developed through a relationship with a third party. These agreements may be breached, and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. To the extent that our commercial partners, collaborators, employees and consultants use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

Trademarks

Novan® is a registered trademark of our company in the United States. In addition, we have pending trademark applications in the United States, including for Nitricil and Kinsolus.

Research and Development Arrangements

On April 29, 2019, we entered into a royalty and milestone payments purchase agreement with Reedy Creek Investments LLC, or Reedy Creek, pursuant to which Reedy Creek provided us funding in an initial amount of $25.0 million, for us to use primarily to pursue the development, regulatory approval and potential commercialization activities for SB206, for the treatment of molluscum, and advance programmatically other activities with respect to SB414, for atopic dermatitis, and SB204, for acne.

On May 4, 2019, we entered into a development funding and royalties agreement, or the Funding Agreement, with Ligand Pharmaceuticals Incorporated, or Ligand, pursuant to which Ligand provided us funding of $12.0 million, which we used to pursue the development and regulatory approval of SB206, for the treatment of molluscum.

Please see "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding these research and development arrangements, including our obligations under these agreements.

Collaboration and Licensing Agreements

Amended Sato License Agreement

In 2017, we entered into a license agreement, and a related first amendment, with Sato, or collectively, the Sato Agreement, whereby we licensed rights to develop, use, and sell SB204 in certain topical dosage forms in Japan for the treatment of acne vulgaris, and to manufacture the finished form of SB204 for sale in Japan. In October 2018, we entered into a second amendment to the Sato Agreement, or the Sato Amendment, and collectively, with the Sato Agreement, the Amended Sato Agreement. The Sato Amendment expands the Amended Sato Agreement to include SB206, our product candidate for the treatment of viral skin infections, including molluscum. Pursuant to the Amended Sato Agreement, we granted to Sato an exclusive, royalty-bearing, non-transferable license under certain of our intellectual property rights, with the right to sublicense with our prior written consent, to develop, use and sell products in Japan that incorporate SB206 or SB204 in certain topical dosage forms for the treatment of viral skin infections or acne vulgaris, respectively, and to make the finished form of such products. We, or our designated contract manufacturer will also supply finished product to Sato for use in development of SB204 or SB206 in the licensed territory. The rights granted to Sato do not include the right to manufacture the API of SB206 or SB204; rather, the parties agreed to negotiate a commercial supply agreement pursuant to which we or a third-party contract manufacturer would be the exclusive supplier to Sato of the API for the commercial manufacture of licensed products in the licensed territory.

Under the terms of the Amended Sato Agreement, we also have exclusive rights to certain intellectual property that may be developed by Sato in the future, which we may choose to use for our own development and commercialization of SB204 or SB206 outside of Japan. The term of the Amended Sato Agreement (and the period during which Sato must pay royalties under the Amended Sato Agreement) expires on the twentieth anniversary of the first commercial sale of a licensed product in the licensed field in the licensed territory.

In April 2020, Sato informed us of its intention to progress the SB206 development program in Japan with a Phase 1 clinical trial given the observed treatment benefit and favorable safety profile in the B-SIMPLE program. In November of 2020, Sato determined its initial Japanese Phase 1 study for SB206 would require an amended design, including potential evaluation of lower dose strengths, to further refine dose tolerability in a subsequent Phase 1 study. Based upon (i) the need for an additional Phase 1 study; (ii) Sato's current estimated comprehensive developmental schedule for SB206 including additional post-Phase 1 clinical trials; and (iii) current and future Japanese clinical trial material manufacturing and technical transfer considerations, the Company has concluded that a prospective delay in Sato's overall SB206 development plan has occurred. The Company estimates the program timeline to be extended by 1.75 years from its previous estimate, and a corresponding extension of the performance period to 9.25 years, currently estimated to be completed in the second quarter of 2026.

In late July 2021, Sato communicated an updated plan regarding its amended design for its additional Japanese Phase 1 study for SB206. The amended study design includes evaluation of potential lower dose strengths, including potential further refinement in a subsequent dose tolerability study. As part of the communication regarding these Phase 1 studies, Sato also communicated an updated comprehensive timeline for the Japanese SB206 program. The updated timeline assumes that the 12% formulation is appropriate to proceed for development in Japan, and is to be reassessed based on the findings of the Phase 1 study.

Based upon (i) the expected timing of the additional Phase 1 study; (ii) Sato's estimated comprehensive developmental schedule for SB206, including additional post-Phase 1 clinical trials; and (iii) current and future Japanese clinical trial material manufacturing and technical transfer considerations, including the manufacturing site for drug product, we concluded that a prospective delay in Sato's overall SB206 Japanese development plan had occurred in July 2021. We estimate the program timeline to be extended by 0.75 years from our previous estimate, and a corresponding extension of the performance period estimate to 10 years, completing in the first quarter of 2027. We understand that the progression of the Japanese SB204 program could follow the same timeline as the Japanese SB206 program, subject to the nature of the results of Sato's comprehensive asset developmental program, including SB206.

In early January 2022, Sato communicated its decision to progress with the 12% formulation in its Phase 1 study, rather than lower dose strengths. Therefore, the most recent estimated development timeline remains reasonable, and continues to be subject to

prospective reassessment and adjustment based upon Sato's interaction with the Japanese regulatory authorities and other developmental and timing considerations.

For additional information about the Amended Sato Agreement, please refer to the sections entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" in this Annual Report and "Note 4—Licensing Arrangements" to the accompanying consolidated financial statements included in this Annual Report.

UNC License Agreement

We acquired exclusive rights to our library of Nitricil compounds pursuant to license agreements with UNC entered into in July 2007 and October 2009, which were subsequently amended, restated and consolidated in June 2012. We amended the consolidated license agreement in November 2012 to expand the scope of licensed patents to cover additional nitric oxide technologies in consideration for an upfront cash payment. We may obtain similar amendments to the consolidated license agreement to expand the scope of licensed patents to cover future additional nitric oxide technologies or as improvements on licensed technology and, if such amendments were executed, we may be required to pay additional upfront cash payments. In April 2016, November 2018 and November 2021, we amended the agreement to clarify the scope of the intellectual property of the consolidated license agreement and to make modifications to certain milestones under the consolidated license agreement.

Under the consolidated license agreement with UNC, we are granted an exclusive, worldwide license, with the ability to sublicense, under the licensed UNC patents, including those directed to Nitricil compounds, to develop and commercialize products utilizing the licensed technology. As partial consideration for the consolidated license agreement, we issued 19,105 shares of our common stock to UNC and a nominal upfront cash payment. Additionally, under the consolidated license agreement, we are obligated to pay UNC a running royalty percentage in the low single digits on net sales of licensed products (by us or any of our sublicensees, such as Sato), and to pay up to $425,000 to UNC in regulatory and commercial milestones on a licensed product by licensed product basis.

Under the consolidated license agreement, UNC controls prosecution activities with respect to licensed patents owned solely by UNC, we control prosecution activities with respect to licensed patents jointly owned by us and UNC and we are obligated to reimburse UNC for reasonable prosecution and maintenance costs. Pursuant to the consolidated license agreement, we have the first right to defend against third-party claims of patent infringement with respect to the licensed products and to enforce the licensed patents against third-party infringers.

Unless earlier terminated by us at our election, or if we materially breach the agreement or become bankrupt, the consolidated license agreement remains in effect on a country by country and licensed product by licensed product basis until the expiration of the last to expire issued patent covering such licensed product in the applicable country, and upon such expiration, we receive a perpetual, unrestricted, fully-paid and royalty free right to develop and commercialize such licensed product in such country. As of December 31, 2021, the last to expire issued patent licensed to us under the consolidated license agreement is projected to expire in 2033. UNC may terminate the agreement or render the license granted thereunder non-exclusive for our material breach of the agreement that remains uncured after 90 days of receipt of written notice thereof from UNC and may also terminate the agreement or render the license granted thereunder non-exclusive upon providing written notice for our bankruptcy or insolvency-related events within 30 days of the occurrence of such events. We may terminate the agreement at any time for convenience upon providing written notice of not less than 30 days to UNC.

Separation Transaction and Licensing Arrangements with KNOW Bio, including Amendments

2015 Separation Transaction and Licensing Arrangements

In connection with the December 2015 separation of our non-dermatology assets to KNOW Bio, we granted to KNOW Bio, through two separate agreements, exclusive licenses, with the right to sublicense, to certain United States and foreign patents and patent applications controlled by us as of the execution date of the agreement, and, under one of the agreements, patents and patent applications which became controlled by us during the three years immediately following the execution date of such agreement, directed towards nitric oxide-releasing compositions and methods of manufacturing thereof, including methods of manufacturing Nitricil compounds, and other nitric oxide-based therapeutics.

Under the exclusive licenses, the following rights were retained by Novan or conveyed to KNOW Bio:

- Novan retained exclusive development and commercialization rights in all fields for any products containing certain specified particles, referred to as the Novan Particles, including those in our NVN1000 API and in other NCEs we are developing.
- Novan retained exclusive rights to develop and commercialize products utilizing the licensed technology in the Retained Dermatology Field, which is defined as the diagnosis, treatment, prevention, and palliation of diseases,

conditions, or disorders of the skin, nails, hair or scalp in humans or animals, and all cosmetic uses for the skin, nails, hair or scalp, other than (i) for wound care through formulations of therapeutic product specifically designed to treat chronic wounds, thermal burns, radiation injury, accidental injury, surgical sites or scars, and (ii) therapeutic uses for treating cancer, excluding basal cell carcinoma, squamous cell carcinoma, precancerous conditions of the skin, actinic keratosis, actinic cheilitis, cutaneous horn, Bowen disease, radiation dermatosis, and dysplastic nevi. The Retained Dermatology Field was amended in 2017 as described in the section entitled "2017 Amendments to KNOW Bio Licensing Arrangements" in this Annual Report.

- KNOW Bio received exclusive rights to develop and commercialize products utilizing the licensed technology, excluding products containing the Novan Particles, in the KNOW Bio Field, which is defined as all fields of use except for the Retained Dermatology Field. The KNOW Bio Field was amended in 2017 as described in the section entitled "2017 Amendments to KNOW Bio Licensing Arrangements" in this Annual Report.

Under one of these exclusive license agreements, KNOW Bio granted to us an exclusive license, with the right to sublicense, under any patents and patent applications which became controlled by KNOW Bio during the three years immediately following the execution date of such agreement and directed towards nitric oxide-releasing compositions and methods of manufacturing thereof, including methods of manufacturing Nitricil compounds, and other nitric oxide-based therapeutics, but not towards medical devices, for use in the diagnosis, treatment, prevention, and palliation of diseases, conditions, or disorders in the Retained Dermatology Field, including but not limited to SB204, SB206, SB208, SB414 and our other presently-contemplated dermatology pipeline candidates. KNOW Bio granted us a right of first negotiation to obtain a license under any patents and patent applications generated by KNOW Bio during the first three years following the execution date of the agreement and directed towards medical devices to develop and commercialize licensed products in the Retained Dermatology Field. Additionally, Novan and KNOW Bio also agreed that neither party would commercialize any products in the other's field of use during the first three years following the execution date of the agreement. The three-year period in which new patents and patent applications controlled by us or by KNOW Bio are added to the exclusive licenses and the three-year term of the commercialization non-compete both expired on December 29, 2018. Neither we nor, to our knowledge, KNOW Bio commercialized a product in the other party's field during this period.

Additionally, we granted to KNOW Bio exclusive sublicenses, with the ability to further sublicense, under certain of the United States and foreign patents and patent applications exclusively licensed to us from UNC and another third party directed towards nitric oxide-releasing compositions, including certain Nitricil compounds, to develop and commercialize products utilizing the licensed technology in the KNOW Bio Field. Under the exclusive sublicense to the UNC patents and applications, KNOW Bio is subject to the terms and conditions under the consolidated license agreement with UNC, including diligence obligations and milestone payment obligations.

Under the exclusive license agreements and sublicense agreements, we retain all rights under our owned and exclusively licensed patents and patent applications with respect to development and commercialization of products for use in the Retained Dermatology Field. The exclusive license agreements and sublicense agreements will continue for so long as there is a valid patent claim under the respective agreement, unless earlier terminated, and upon expiration continues as a perpetual non-exclusive license. Under each agreement, Novan and KNOW Bio have the right to terminate the agreement by written notice for the other party's material breach which remains uncured within 30 days of receipt of notice thereof. Novan also has the right to terminate each such agreement immediately upon written notice if KNOW Bio, its affiliates or sublicensees challenge the validity of any patent licensed in such agreement. KNOW Bio has the right to terminate each such agreement, with notice, for any reason upon ninety days advance written notice to the Company. The licenses granted by KNOW Bio to the Company in the agreements survive termination of the agreements.

For additional information about the Separation Transaction, please see "Note 2—KNOW Bio, LLC" to the accompanying consolidated financial statements included in this Annual Report.

2017 Amendments to KNOW Bio Licensing Arrangements

In October 2017, we entered into certain amendments, or the KNOW Bio Amendments, to the original license and sublicense agreements described above between us and KNOW Bio, or the Original KNOW Bio Agreements. Pursuant to the terms of the KNOW Bio Amendments, we re-acquired from KNOW Bio exclusive, worldwide rights under certain United States and foreign patents and patent applications controlled by us as of the execution date of the Original KNOW Bio Agreements, and patents and patent applications which became controlled by us during the three years immediately following the execution date of the Original KNOW Bio Agreements, directed towards nitric oxide-releasing compositions and methods of manufacturing thereof, including methods of manufacturing Nitricil compounds, and other nitric oxide-based therapeutics, to develop and commercialize products for all diagnostic, therapeutic, prophylactic and palliative uses for any disease, condition or disorder caused by certain oncoviruses, or the Oncovirus Field. KNOW Bio also granted to us an exclusive license, with the right to sublicense, under any patents and patent applications which became controlled by KNOW Bio during the three years immediately following the execution date of the

Original KNOW Bio Agreements and directed towards nitric oxide-releasing compositions and methods of manufacturing thereof, including methods of manufacturing Nitricil compounds, and other nitric oxide-based therapeutics, but not towards medical devices, to develop and commercialize products for use in the Oncovirus Field. Additionally, KNOW Bio agreed that KNOW Bio would not commercialize any products in the Oncovirus Field during the first three years following the execution date of the Original KNOW Bio Agreements. The three-year period in which new patents and patent applications controlled by KNOW Bio are added to the exclusive license and the three-year term of the commercialization non-compete both expired on December 29, 2018.

The rights granted to us in the Oncovirus Field in the KNOW Bio Amendments continue for so long as there is a valid patent claim under the Agreements, and upon expiration continue on a perpetual non-exclusive basis, and are subject to the termination rights of KNOW Bio and us that are set forth in the Original KNOW Bio Agreements. In addition, under the KNOW Bio Amendments, KNOW Bio may terminate the rights granted to the Company in the Oncovirus Field without terminating the Original KNOW Bio Agreements.

Additional terms, including our financial obligations, under the KNOW Bio Amendments are described in further detail in "Note 2—KNOW Bio, LLC" to the accompanying consolidated financial statements included in this Annual Report.

Government Regulation

The FDA and comparable regulatory authorities in state and local jurisdictions and in other countries impose substantial and burdensome requirements upon companies involved in the clinical development, manufacture, marketing and distribution of drugs, such as those we are developing. These agencies and other federal, state and local entities regulate, among other things, the research and development, testing, manufacture, quality control, safety, effectiveness, labeling, storage, record keeping, approval, advertising and promotion, distribution, post-approval monitoring and reporting, sampling and export and import of our product candidates.

United States Government Regulation

In the United States, the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and its implementing regulations. The process of obtaining regulatory approvals and the subsequent compliance with applicable federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources.

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

- completion of preclinical laboratory tests, animal studies and formulation studies in compliance with the FDA's Good Laboratory Practice, or GLP, regulations;
- submission to the FDA of an IND which must become effective before human clinical trials may begin;
- approval by an independent Institutional Review Board, or IRB, or ethics committee at each clinical site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with good clinical practice, or GCP, requirements to establish the safety and efficacy of the proposed drug product for each indication;
- submission to the FDA of an NDA after completion of all pivotal clinical trials;
- satisfactory completion of an FDA advisory committee review, if applicable;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the product is produced to assess compliance with current good manufacturing practice, or cGMP, requirements and to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity, and of selected clinical investigation sites to assess compliance with GCPs; and
- FDA review and approval of the NDA to permit marketing of the product for particular indications for uses in the United States.

Preclinical Studies

Preclinical studies include laboratory evaluation of product chemistry, toxicity and formulation, as well as animal studies to assess potential safety and efficacy. Prior to beginning the first clinical trial with a product candidate in the United States, a sponsor must submit an IND to the FDA, which is a request for authorization from the FDA to administer an investigational drug product to humans. To support an IND to conduct clinical trials, a sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data and any available clinical data or literature, among other things, to the FDA as part of an IND. Some preclinical testing may continue even after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to one or more proposed clinical trials and

places the clinical trial on a clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Clinical Trials

Clinical trials involve the administration of the IND to human subjects under the supervision of qualified investigators in accordance with GCP requirements, which include the requirement that all research subjects provide their informed consent in writing for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the trial, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A protocol for each clinical trial and any subsequent protocol amendments must be submitted to the FDA as part of the IND. In addition, an IRB at each institution participating in the clinical trial must review and approve the protocol for any clinical trial before it commences at that institution. Some clinical trials are overseen by an independent group of qualified experts organized by the sponsor, known as a data safety monitoring board or committee. Depending on its charter, this group may determine whether a trial may move forward at designated check points based on access to certain data from the trial. In addition, information about certain clinical trials must be submitted within specific timeframes to the National Institutes of Health for public dissemination on its www.clinicaltrials.gov website.

Human clinical trials are typically conducted in three sequential phases, which may overlap or be combined:

- Phase 1 clinical trial: The drug is initially introduced into healthy human subjects or patients with the target disease or condition and tested for safety, dosage tolerance, absorption, metabolism, distribution, excretion and, if possible, to gain an early indication of its effectiveness.
- Phase 2 clinical trial: The drug is administered to a limited patient population with the specified disease or condition to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance and optimal dosage.
- Phase 3 clinical trials: The drug is administered to an expanded patient population with the specified disease or condition, generally at geographically dispersed clinical trial sites, in well-controlled clinical trials to generate enough data to statistically evaluate the efficacy and safety of the product for approval, to establish the overall risk-benefit profile of the product and to provide adequate information for the labeling of the product.

Post-approval trials, sometimes referred to as Phase 4 studies, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, the FDA may mandate the performance of Phase 4 clinical trials as a condition of approval of an NDA.

While the IND is active, progress reports summarizing the results of the clinical trials and non-clinical studies performed since the last progress report, among other information, 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 drug, findings from animal or in vitro testing suggesting a significant risk to humans exposed to the drug, and any clinically important increased rate of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure. The FDA or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients.

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.

Marketing Approval

Assuming successful completion of the required testing in accordance with all applicable regulatory requirements, the results of the preclinical studies and clinical trials, together with detailed information relating to the product's chemistry, manufacture, controls and proposed labeling, among other things, are submitted to the FDA as part of an NDA requesting approval to market the product for one or more indications for use. In most cases, the submission of an NDA is subject to a substantial application user fee.

In addition, under the Pediatric Research Equity Act of 2003, or PREA, as amended and reauthorized, certain NDAs or supplements to an NDA must contain data that are adequate to assess the safety and effectiveness of the drug for the claimed indications in all relevant pediatric subpopulations, and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The FDA may, on its own initiative or at the request of the applicant, grant deferrals for submission of some or all pediatric data until after approval of the product for use in adults, or full or partial waivers from the pediatric data requirements.

The FDA conducts a preliminary review of all NDAs within the first 60 days after submission, before accepting them for filing, to determine whether they are sufficiently complete to permit substantive review. The FDA may request additional information rather than accept an NDA for filing. In this event, the application must be resubmitted with the additional information. The resubmitted application is also subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review. Under the Prescription Drug User Fee Act, or PDUFA, guidelines that are currently in effect, the FDA has a goal of ten months from the date of "filing" of a standard NDA for a new molecular entity to review and act on the submission. This review typically takes twelve months from the date the NDA is submitted to the FDA because the FDA has approximately two months to make a "filing" decision as to whether it will accept the application for filing. The actual review time may be significantly longer, depending on the complexity of the review, FDA requests for additional information and the sponsor's submission of additional information.

The FDA reviews an NDA to determine, among other things, whether the drug is safe and effective and whether the facility in which it is manufactured, processed, packaged or held meets standards designed to assure the product's continued safety, quality and purity. During its review, the FDA may raise additional issues or request additional data or information, during which time, the review period is generally suspended until such requests are received. This can delay, sometimes substantially, the FDA's review and potential approval of an application.

The FDA may refer an application for a novel drug to an advisory committee. 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. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Before approving an NDA, the FDA typically will inspect the facility or facilities where the product is manufactured. The FDA will not approve an 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 within required specifications. Additionally, before approving an NDA, the FDA may inspect one or more clinical trial sites to assure compliance with GCP requirements.

After evaluating the NDA and all related information, including the advisory committee recommendation, if any, and inspection reports regarding the manufacturing facilities and clinical trial sites, the FDA may issue an approval letter, or, in some cases, a complete response letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. A complete response letter generally contains a statement of specific conditions that must be met in order to secure final approval of the NDA and may require additional clinical or preclinical testing in order for FDA to reconsider the application. Even with submission of this additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval. If and when those conditions have been met to the FDA's satisfaction, the FDA will typically issue an approval letter.

Even if the FDA approves a product, it may limit the approved indications for use of the product, require that contraindications, warnings or precautions be included in the product labeling, require that post-approval studies, including Phase 4 clinical trials, be conducted to further assess a drug's safety after approval, or require testing and surveillance programs to monitor the product after commercialization. The FDA may also place other conditions on approval, including the requirement for a risk evaluation and mitigation strategy, or REMS, to assure the safe use of the drug. If the FDA concludes a REMS is needed, the sponsor of the NDA must submit a proposed REMS. The FDA will not approve the NDA without an approved REMS, if required. A REMS could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools.

The FDA may prevent or limit further marketing of a product based on the results of post-marketing studies or surveillance programs or if unexpected safety or efficacy concerns arise. After approval, some types of changes to the approved product, such as adding new indications, manufacturing changes and additional labeling claims, are subject to further testing requirements and FDA review and approval. In addition, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could impact the timeline for regulatory approval or otherwise impact ongoing development programs.

Special FDA Expedited Review and Approval Programs

The FDA offers a number of expedited development and review programs for qualifying product candidates. To be eligible for a fast track designation, the FDA must determine, based on the request of a sponsor, that a product is intended to treat a serious or life-threatening disease or condition and demonstrates the potential to address an unmet medical need for such disease or condition. Fast Track designation applies to the combination of the product candidate and the specific indication for which it is being studied. The sponsor of a Fast Track designated product candidate has opportunities for more frequent interactions with the applicable FDA review team during product development. In addition, the FDA may review sections of the NDA for a fast track designated product candidate on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA, the FDA agrees to accept sections of the NDA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the NDA.

A product candidate intended to treat a serious or life-threatening disease or condition may also be eligible for breakthrough therapy designation to expedite its development and review. A product candidate can receive breakthrough therapy designation if preliminary clinical evidence indicates that the product candidate, alone or in combination with one or more other drugs or biologics, may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. The designation includes all of the fast track program features, as well as more intensive FDA interaction and guidance beginning as early as Phase 1, and an organizational commitment to expedite the development and review of the product candidate, including involvement of senior managers.

Any marketing application for a drug submitted to the FDA for approval, including a product candidate with a fast track designation or breakthrough therapy 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 candidate is eligible for priority review if it is designed to treat a serious or life-threatening disease or condition, and, if approved, would provide a significant improvement in safety or effectiveness compared to available alternatives for such disease or condition. A priority review means that the goal for the FDA to review an application is six months, rather than the standard review of ten months under current PDUFA guidelines. Under the new PDUFA agreement, these six and ten-month review periods are measured from the "filing" date rather than the receipt date for NDAs for new molecular entities, which typically adds approximately two months to the timeline for review and decision from the date of submission.

In addition, product candidates studied for their safety and effectiveness in treating serious or life-threatening illnesses may be eligible for accelerated approval and may be approved upon a determination that the product candidate 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, 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 approval, the FDA may require a sponsor of a drug receiving accelerated approval to perform post-marketing studies to verify and describe the predicted effect on irreversible morbidity or mortality or other clinical endpoint, and the drug may be subject to accelerated withdrawal procedures if the sponsor fails to conduct the required post-marketing studies or if such studies fail to verify the predicted clinical benefit. 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.

Fast track designation, breakthrough therapy designation, priority review, and accelerated approval do not change the standards for approval and approval is not guaranteed. Such designation may, however, expedite the development or approval process. Even if a product candidate qualifies for one or more of these programs, the FDA may later decide that the product candidate no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

Emergency Use Authorization

The Commissioner of the FDA, under delegated authority from the Secretary of Health and Human Services, or HHS, may, under certain circumstances allow for the marketing of a product that does not otherwise comply with FDA regulations by issuing an Emergency Use Authorization, or EUA, for such product. Specifically, before an EUA may be issued, there must be a government determination of certain threats or emergencies, or potential threats or emergencies. In the case of a public health emergency (or significant potential thereof), the Secretary of HHS must determine that the public health emergency affects or has the significant potential to affect national security or the health and security of U.S. citizens abroad, and that it involves a chemical, biological, radiological, or nuclear agent, or CBRN, or a disease or condition that may be attributable to such CBRN. On February 4, 2020, the Secretary of HHS determined that there is such a public health emergency that involves the virus now known as SARS-CoV-2, the virus that causes the COVID-19 infection. Once the determination of the threat or emergency has been made, the Secretary of HHS must then declare that an emergency exists justifying the issuance of EUAs for certain types of products (referred to as EUA declarations). On March 27, 2020, the Secretary of HHS declared – on the basis of his determination of a public health emergency that has the potential to affect national security or the health and security of U.S. citizens living abroad that involves SARS-CoV-2 – that circumstances exist justifying authorization of drugs and biologics during the COVID-19 pandemic, subject to the terms of any EUA that is issued.

Once an EUA declaration has been issued, the FDA can issue EUAs for products that fall within the scope of that declaration. To issue an EUA, the FDA Commissioner must conclude that (1) the CBRN that is referred to in the EUA declaration can cause serious or life-threatening diseases or conditions; (2) based on the totality of scientific evidence available, it is reasonable to believe that the product may be effective in diagnosing, treating, or preventing the disease or condition attributable to the CBRN and that the product's known and potential benefits outweigh its known and potential risks; and (3) there is no adequate, approved, and available alternative to the product. Products subject to an EUA must still comply with the conditions of the EUA, including labeling and marketing requirements. Moreover, the authorization to market products under an EUA is limited to the period of time the EUA declaration is in effect, and the FDA can revoke an EUA in certain circumstances.

Post-Approval Requirements

Drugs manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product sampling and distribution, advertising and promotion and reporting of adverse experiences associated with the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims are subject to prior FDA review and approval. There also are continuing, annual program fee requirements for any marketed products.

The FDA may impose a number of post-approval requirements as a condition of approval of an NDA. For example, the FDA may require post-marketing testing, including Phase 4 clinical trials, and surveillance to further assess and monitor the product's safety and effectiveness after commercialization. The FDA may also limit the indications for use or may impose labeling or other requirements on the product.

In addition, drug manufacturers and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and state agencies and are subject to periodic unannounced inspections by the FDA and these state agencies for compliance with cGMP requirements. Changes to the manufacturing process are strictly regulated and often require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP requirements and impose reporting and documentation requirements upon the sponsor and any third-party manufacturers that the sponsor may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain cGMP compliance.

Once an approval is granted, the FDA may withdraw the approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in mandatory revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical trials to assess new safety risks; or imposition of distribution or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters or holds on post-approval clinical trials;
- refusal of the FDA to approve pending NDAs or supplements to approved NDAs, or suspension or revocation of product approvals;

- product seizure or detention, or refusal to permit the import or export of products; or
- injunctions or the imposition of civil or criminal penalties.

The FDA strictly regulates marketing, labeling, advertising and promotion of products that are placed on the market. Drugs may be promoted only for the approved indications and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability. Failure to comply with these requirements can result in, among other things, adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties.

Other Health Care Laws

In addition to FDA restrictions on marketing of pharmaceutical products, other United States federal and state healthcare regulatory laws restrict business practices in the pharmaceutical industry, which include, but are not limited to, state and federal anti-kickback, false claims, and transparency laws with respect to drug pricing and payments and other transfers of value made to physicians and other healthcare providers.

The federal Anti-Kickback Statute prohibits, among other things, any person or entity from knowingly and willfully offering, paying, soliciting, receiving or providing any remuneration, directly or indirectly, overtly or covertly, to induce or in return for purchasing, leasing, ordering, or arranging for or recommending the purchase, lease, or order of any item or service reimbursable, in whole or in part, under Medicare, Medicaid or other federal healthcare programs. The term "remuneration" has been broadly interpreted to include anything of value. The Anti-Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers and formulary managers on the other. In addition, 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. The majority of states also have anti-kickback laws, which establish similar prohibitions and in some cases may apply to items or services reimbursed by any third-party payor, including commercial insurers.

The federal False Claims Act prohibits any person or entity from, among other things, knowingly presenting, or causing to be presented, a false, fictitious or fraudulent claim for payment to, or approval by, the federal government or knowingly making, using, or causing to be made or used a false record or statement material to a false or fraudulent claim to the federal government, or from knowingly making a false statement to avoid, decrease or conceal an obligation. A claim includes "any request or demand" for money or property presented to the United States government. Violation of the federal Anti-Kickback Statute may also constitute a false or fraudulent claim for purposes of the federal civil False Claims Act. Actions under the civil False Claims Act may be brought by the Attorney General or as a "*qui tam*" action by a private individual in the name of the government. Violations of the civil False Claims Act can result in very significant monetary penalties and treble damages. In addition, the civil monetary penalties statute imposes penalties against any person who is determined to have presented or caused to be presented a claim to a federal health program that the person knows or should know is for an item or service that was not provided as claimed or is false or fraudulent. Many states also have similar fraud and abuse statutes or regulations that apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor. Given the significant size of actual and potential settlements, it is expected that the government authorities will continue to devote substantial resources to investigating healthcare providers' and manufacturers' compliance with applicable fraud and abuse laws.

The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, prohibits, among other actions, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third-party payors, knowingly and 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 any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. 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.

In addition, there has been a recent trend of increased federal and state regulation of payments made to physicians and certain other healthcare providers. Under the federal Physician Payments Sunshine Act, certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid, or the Children's Health Insurance Program, with specific exceptions, to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to payments and "transfers of value" provided to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), certain non-physician practitioners such as physician assistants and nurse practitioners, and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members. In addition, certain states require implementation of compliance programs and compliance with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, impose restrictions on marketing practices, and/or tracking and

reporting of pricing information and marketing expenditure as well as gifts, compensation and other remuneration or items of value provided to physicians and other healthcare professionals and entities.

Violation of any of such laws or any other governmental regulations that may apply to us can result in penalties, including, without limitation, administrative, civil and criminal penalties, damages, fines, disgorgement, contractual damages, reputational harm, diminished profits and future earnings, the curtailment or restructuring of our operations, exclusion from participation in federal and state healthcare programs and individual imprisonment.

Coverage and Reimbursement

Sales of our product candidates, if approved, by us or any potential commercial partners will depend, in part, on the extent to which such products will be covered by third-party payors, such as government healthcare programs, commercial insurance and managed healthcare organizations. These third-party payors are increasingly limiting coverage or reducing reimbursements for medical products and services. Patients are unlikely to use our products unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our products. Sales of any products for which we receive regulatory approval for commercial sale will therefore depend, in part, on the availability of coverage and adequate reimbursement from third-party payors. Third-party payors include government authorities, managed care plans, private health insurers and other organizations.

The process for determining whether a third-party payor will provide coverage for a drug typically is separate from the process for setting the price of such product or for establishing the reimbursement rate that the payor will pay for the product once coverage is approved. Third-party payors may limit coverage to specific products on an approved list, also known as a formulary, which might not include all of the FDA-approved products for a particular indication. A decision by a third-party payor not to cover our product candidates could reduce a physician's willingness to prescribe our products once approved and have a material adverse effect on our sales, results of operations and financial condition. Moreover, a third-party payor's decision to provide coverage for a drug does not imply that an adequate reimbursement rate will be approved. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development. Additionally, coverage and reimbursement for products can differ significantly from payor to payor. One third-party payor's decision to cover a particular medical product or service does not ensure that other payors will also provide coverage for the medical product or service, or will provide coverage at an adequate reimbursement rate.

In addition, the United States government, state legislatures and foreign governments have continued implementing cost-containment programs, including price controls, restrictions on reimbursement and requirements for substitution of generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit our net revenue and results. Third-party payors are increasingly challenging the prices charged for medical products and services, examining the medical necessity and reviewing the cost-effectiveness of drugs, in addition to questioning safety and efficacy. If these third-party payors do not consider our products to be cost-effective compared to other available therapies, they may not cover our products after FDA approval or, if they do, the level of payment may not be sufficient to allow us to sell our products at a profit.

Healthcare Reform

A primary trend in the United States healthcare industry and elsewhere is cost containment. Government authorities and other third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medical products. For example, the Affordable Care Act, or ACA, among other things, increased the minimum Medicaid rebates owed by most manufacturers under the Medicaid Drug Rebate Program; introduced a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected; extended the Medicaid Drug Rebate Program to utilization of prescriptions of individuals enrolled in Medicaid managed care plans; subjected drug manufacturers to new annual fees based on pharmaceutical companies' share of sales to federal healthcare programs; and created a new Patient Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research.

Since its enactment, there have been judicial, executive and Congressional challenges to certain aspects of the ACA. On June 17, 2021, the U.S. Supreme Court dismissed the most recent judicial challenge to the ACA without specifically ruling on the constitutionality of the ACA. Prior to the Supreme Court's decision, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through August 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructed certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA.

In addition, other legislative changes have been proposed and adopted in the United States since the ACA was enacted. This included aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments, will stay in effect through 2030, with the exception of a temporary suspension from May 1, 2020 through March 31, 2022, unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act was signed into law, which, among other things, further reduced Medicare payments to several providers, including hospitals and imaging centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. Recently there has also been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed and enacted 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.

We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our products once approved or additional pricing pressures. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our product candidates.

Data Privacy and Security

Pharmaceutical companies may be subject to United States federal and state and foreign data privacy, security and data breach notification laws governing the collection, use, disclosure and protection of health-related and other personal information. In the United States, HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, and regulations implemented thereunder, or collectively HIPAA, imposes privacy, security and breach reporting obligations with respect to individually identifiable health information upon "covered entities" (health plans, health care clearinghouses and certain health care providers), and their respective business associates, individuals or entities that create, receive, maintain or transmit protected health information in connection with providing a service for or on behalf of a covered entity, as well as their covered subcontractors. HIPAA mandates the reporting of certain breaches of health information to HHS, affected individuals and if the breach is large enough, the media. Entities that are found to be in violation of HIPAA as the result of a breach of unsecured protected health information, a complaint about privacy practices or an audit by HHS, may be subject to significant civil, criminal and administrative fines and penalties and/or additional reporting and oversight obligations if required to enter into a resolution agreement and corrective action plan with HHS to settle allegations of HIPAA non-compliance. Even when HIPAA does not apply, according to the Federal Trade Commission or the FTC, failing to take appropriate steps to keep consumers' personal information secure may constitute unfair acts or practices in or affecting commerce in violation of Section 5(a) of the Federal Trade Commission Act. 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.

In addition, certain state laws govern the privacy and security of health-related and other personal information in certain circumstances, many of which differ from each other in significant ways and may not have the same requirements, thus complicating compliance efforts. By way of example, the California Consumer Privacy Act, or the CCPA, which went into effect January 1, 2020, among other things, creates new data privacy obligations for covered companies and provides new privacy rights to California residents, including the right to opt out of certain disclosures of their information. The CCPA also creates a private right of action with statutory damages for certain data breaches, thereby potentially increasing risks associated with a data breach. Although the law includes limited exceptions, including for "protected health information" maintained by a covered entity or business associate, it may regulate or impact our processing of personal information depending on the context. Further, the California Privacy Rights Act, or the CPRA, was recently voted into law by California residents. The CPRA significantly amends the CCPA, and imposes additional data protection obligations on covered companies doing business in California, including additional consumer rights processes and opt outs for certain uses of sensitive data. It also creates a new California data protection agency specifically tasked to enforce the law, which would likely result in increased regulatory scrutiny of California businesses in the areas of data protection and security. The substantive requirements for companies subject to the CPRA will go into effect on January 1, 2023.

In Europe, the European Union General Data Protection Regulation, or the GDPR, went into effect in May 2018 and imposes strict requirements for processing the personal data of data subjects within the European Economic Area, or the EEA. Companies that must comply with the GDPR face increased compliance obligations and risk, including more robust regulatory enforcement of data protection requirements and potential fines for noncompliance of up to €20 million or 4% of the annual global revenues of the noncompliant company, whichever is greater. In addition, the GDPR increases the scrutiny of transfers of personal data from clinical trial sites located in the EEA to the United States and other jurisdictions that the European Commission does not recognize as having "adequate" data protection laws; in July 2020, the Court of Justice of the European Union, or the CJEU, limited how organizations could lawfully transfer personal data from the EEA to the United States by invalidating the EU-US Privacy Shield and

imposing further restrictions on use of the standard contractual clauses, which could increase our costs and our ability to efficiently process personal data from the EEA. Additionally, from January 1, 2021, we have had to comply with the GDPR and also the United Kingdom General Data Protection Regulation, or the UK GDPR, which, together with the amended UK Data Protection Act 2018, retains the GDPR in United Kingdom, or UK, national law. The UK GDPR mirrors the fines under the GDPR, e.g., fines up to the greater of €20 million (£17.5 million) or 4% of global turnover. The relationship between the UK and the European Union, or the EU, in relation to certain aspects of data protection law remains unclear, and it is unclear how UK data protection laws and regulations will develop in the medium to longer term, and how data transfers to and from the UK will be regulated in the long term. The European Commission has adopted an adequacy decision in favor of the UK, enabling data transfers from EU member states to the UK without additional safeguards. However, the UK adequacy decision will automatically expire in June 2025 unless the European Commission re-assesses and renews or extends that decision.

Supply Chain

We continue to assess the impact of COVID-19 on our supply chain and related vendors and global supply chain constraints across various industries, including interruption of, or delays in receiving, supplies of raw materials, API or drug product from third-party manufacturers due to staffing shortages, production slowdowns or stoppages and disruptions in delivery systems. We are also continuing to evaluate the impacts of COVID-19 and global supply chain constraints on our new facility. We expect to complete the commissioning and validation of our new facility to support various research and development and cGMP activities, including small-scale manufacturing capabilities for API and drug product, by the end of the first half of 2022. We are in the process of, and proceeding with the related preparatory activities associated with qualifying, commissioning and validating the manufacturing equipment for use in API production.

We currently rely on third-party suppliers to provide the raw materials that are used by us or our third-party manufacturers in the manufacture of our product candidates. There are a limited number of suppliers for raw materials, including nitric oxide, that we use to manufacture our product candidates. We also rely on third-party logistics vendors to transport our raw materials, API, and drug products through our supply chain. Certain materials, including our API, have designated hazard classifications that limit available transportation modes or quantities. Third-party logistics vendors may choose to delay or defer transportation of materials from time to time, especially in light of the pandemic and related global supply chain constraints, which could adversely impact the timing or cost of our manufacturing supply chain activities or other associated development activities.

Manufacturing and Supplies

We have adopted a strategy of engaging with, utilizing and relying on third parties through partnerships, collaborations, licensing or other strategic relationships for the performance of activities, processes and services that (i) do not typically result in the generation of significant new intellectual property; and (ii) can leverage their existing robust infrastructure, systems and facilities, as well as associated subject matter expertise. A parallel and inter-related strategic objective has been to manage our own internal resources, including our manufacturing capabilities.

Drug Substance

Upon successful completion of the required technology transfer, we intend for a new third-party API manufacturer to be able to manufacture berdazimer sodium in compliance with established manufacturing processes, applicable regulatory guidelines and as appropriate for potential large-scale commercial quantities.

In June 2019, we established an operating and business relationship with a third-party full-scale API manufacturer, with the goal being for this third-party API manufacturer to become the primary external supplier of our proprietary berdazimer sodium (NVN1000) drug substance. We executed a master contract manufacturing agreement, which included the process and analytical method transfer necessary to advance the production of our drug substance for future clinical trials and potentially for commercial purposes on a global basis if any of our product candidates are approved.

Through January 2021, we remained engaged in technical transfer efforts with this third-party API manufacturer. However, in February 2021, based on progress to date, including timing considerations relating to top-line results for the B-SIMPLE4 Phase 3 trial, we terminated our existing work orders related to technical transfer activities with this third-party API manufacturer. The master services agreement remains in place with this third-party API manufacturer for potential longer term needs.

We have since entered into development services agreements with other third-party full-scale API manufacturers for certain manufacturing process feasibility services including process familiarization, safety assessments, preliminary engineering studies, and initial process and analytical methods determination. Following the successful completion of such preliminary activities with a third-party API manufacturer and other preparatory activities, we would then plan to proceed with a third-party API manufacturer beyond the initial stages noted above, in which case we would expect to incur substantial costs associated with technical transfer

efforts, capital expenditures, manufacturing capabilities, and ultimately, potential large-scale commercial quantities of our drug substance.

Internal Capability

We manufactured the API necessary for the B-SIMPLE4 Phase 3 trial using internal manufacturing capabilities at our former facility. In addition, we currently have an inventory of API that allows us to continue certain preclinical and/or developmental activities.

With the B-SIMPLE4 Phase 3 trial positive top-line efficacy results, we are targeting a potential NDA submission of SB206 for molluscum no later than the fourth quarter of 2022. We are in the process of commissioning and validating our new facility, which we expect to complete by the end of the first half of 2022, to support various research and development and cGMP activities, including the production of cGMP API registration batches necessary to support the SB206 NDA submission as well as other small-scale manufacturing capabilities for API and drug product.

The anticipated additional manufacturing capabilities that we expect to come from our new facility include the ability to act as a supportive, or potentially primary, component of, or as a back up to, elements of a potential future commercial supply chain, and the ability to produce limited quantities of clinical trial materials. We believe the new facility, once operational, will have the capability to support our planned potential NDA submission for SB206 and potential commercial launch quantities of API for SB206. The timing of our efforts to submit an NDA and to have a third-party full-scale API manufacturer ready for production are expected to inform our future decisions on the expected duration and utilization level of the capabilities of our new facility.

We expect to continue to work toward completion of technical transfer activities with a third-party full-scale API manufacturer to provide the API needed for long-term commercial supply of drug substance, if any of our product candidates are approved. We believe this strategy of increasing utilization of and reliance upon third-party vendors and strategic partners for the performance of activities, processes and services can ultimately provide enhanced capabilities and operating efficiencies for us or any of our potential partnerships, collaborations, licensing or other strategic relationships. At the same time, we are attempting to balance the need to have internal capabilities to allow flexibility for the progression of our product development programs on our targeted timelines.

Drug Product

On October 15, 2018, we established a strategic alliance with Orion Corporation, or Orion, a Finnish full-scale pharmaceutical company with broad experience in drug manufacturing. The alliance enables Orion to manufacture our topical nitric oxide-releasing product candidates on our behalf and on the behalf of our global strategic partners. We have executed a master contract manufacturing agreement to enable technology transfer and manufacturing of clinical trial materials for future clinical trials with our topical product candidates. We are engaged in the transfer of technology for the manufacture of both SB204 and SB206, which has been slowed from time to time due to various factors, including in 2020 as part of our efforts to preserve cash, and, upon completion, we intend for Orion to be able to manufacture the drug product, or the finished dosage form of the gel, in accordance with our established manufacturing processes, in compliance with applicable regulatory guidelines and as appropriate for clinical trials. We have continued to work toward completion of technical transfer and manufacturing activities to provide the necessary regulatory registration batches of drug product for our planned NDA submission of SB206 for molluscum, and if any of our product candidates are approved, commercial supply of drug product. A completed manufacturing technology transfer to Orion will enable the manufacture of multiple assets for supply of clinical trial materials and, potentially, commercial quantities if any of our product candidates are approved. Importantly, this alliance is being structured to support major global markets in which we and our partners pursue regulatory approvals for our product candidates.

As we move forward with these initiatives, we will need significant additional funding to continue our operating activities, including these technical transfer projects, potential utilization and development of internal capabilities and cost structure changes, and to make further advancements in our product development programs, as described in the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations —Liquidity and Capital Resources" in this Annual Report.

Single Business Segment

We manage our operations and allocate resources as one reporting segment. For additional information, please refer to the notes to the accompanying consolidated financial statements included in this Annual Report.

Human Capital

Employees

As part of our strategic objective to reduce our own internal resources and large-scale manufacturing capabilities, in February 2020 we took actions that reduced our internal resources, including personnel headcount. As a part of this action, we reduced personnel headcount from a total of 41 full-time employees as of December 31, 2019 to a total of 23 full-time employees as of December 31, 2020. As of December 31, 2021, we had a total of 29 full-time employees, in addition to 3 part-time employees.

Of the 29 full-time employees as of December 31, 2021, 8 were dedicated to our Nitricil technology and formulation science research and development, 6 were dedicated to our manufacturing capability and product operations, 7 were in clinical and regulatory operations, 2 were in commercial operations and 6 were in general and administrative functions. Of the 3 part-time employees as of December 31, 2021, 1 was in clinical and regulatory operations, and 2 were in general and administrative functions.

We also utilize consultants and contractors to support our operating activities and our employees.

Recruiting and retaining qualified personnel and key talent is critical to our success. Our business results depend in part on our ability to successfully manage our human capital resources. Factors that may affect our ability to attract and retain qualified employees include employee morale, competition from other employers and availability of qualified individuals. None of our employees are subject to a collective bargaining agreement or represented by a labor or trade union. We believe we have a good relationship with our employees.

Compensation and Benefits

We strive to provide robust compensation and benefits to our employees. In addition to salaries, compensation and benefit programs include annual bonuses, stock-based compensation awards, a long-term performance based compensation plan, a 401(k) plan with employee matching opportunities, healthcare and insurance benefits, health savings and flexible spending accounts, paid time off and other employee assistance programs. Our ability to attract and retain key personnel who are necessary to the operation of the business and the development of our product candidates is critical to our success.

COVID-19 Pandemic

The health and wellness of our employees is also critical to our success. In an effort to keep our employees safe during the COVID-19 pandemic, we have implemented a number of health-related measures including, but not limited to, protocols governing the use of face-masks while on company property, temperature taking protocols, a flexible work-from-home policy, cleaning procedures at our corporate headquarters, social-distancing protocols, restrictions on visitors to our facility, and limitations on in-person meetings and other gatherings.

Other Information

We were incorporated under the laws of the State of Delaware in 2006. Our principal executive offices are located at 4020 Stirrup Creek Drive, Suite 110, Durham, NC 27703, and our telephone number is 919-485-8080.

We maintain an internet website at www.novan.com and make available free of charge through our website our Annual Report, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Sections 13(a) and 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act. We make these reports available through our website as soon as reasonably practicable after we electronically file such reports with, or furnish such reports to, the Securities and Exchange Commission, or the SEC. Additionally, the SEC maintains an internet website at www.sec.gov that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. The information contained on, or that can be accessible through, our website is not incorporated by reference into, and should not be considered to be a part of, this Annual Report.

Item 1A. Risk Factors.

Our operations and financial results are subject to a high degree of risk. These risks include, but are not limited to, those described below, each of which may have a material and adverse effect on our business, results of operations, cash flows, financial condition and the trading price of our common stock. You should carefully consider the risks described below, together with all of the other information included in this Annual Report. The realization of any of these risks could have a significant adverse effect on our reputation, business, including our financial condition, results of operations and growth, which we refer to collectively in this section as our business, and ability to accomplish our strategic objectives. In that event, the trading price of our common stock could decline, and you may lose part or all of your investment.

Risks Related to Our Current Financial Position and Need for Additional Capital

We have incurred net losses since our inception and anticipate that we will continue to incur net losses for the foreseeable future. We will need significant additional funding to continue our business operations and for the advancement of our product development programs. If we are unable to raise capital when needed, we would be forced to delay, reduce, terminate or eliminate our product development programs, or our commercialization efforts.

We are a pre-commercial pharmaceutical company with a limited operating history. Investment in pharmaceutical and biotechnology product development is highly speculative because it entails substantial upfront capital expenditures and significant risk that any potential product candidate will fail to demonstrate adequate efficacy or an acceptable safety profile, obtain regulatory approval or become commercially viable. We have not yet demonstrated our ability to obtain regulatory approvals, manufacture a drug on a commercial scale, or arrange for a third-party to do so on our behalf, or conduct sales and marketing activities necessary for successful commercialization. Consequently, any predictions you make about our future success or viability may not be as accurate as they could be if we had a longer operating history or a history of successfully developing and commercializing drugs. We have not generated any revenue from product sales to date, and we continue to incur significant development and other expenses related to our ongoing operations. As a result, we are not and have never been profitable and have incurred losses in each period since inception. For the years ended December 31, 2021, and 2020, we reported a net loss of $29.7 million and $29.3 million, respectively. As of December 31, 2021, and 2020, we had an accumulated deficit of $279.0 million, and $249.3 million, respectively, and there is substantial doubt about our ability to continue as a going concern.

We expect to continue to incur significant losses for the foreseeable future, and we expect these losses to increase as we continue our research and development of, and seek regulatory approvals for, our product candidates. We may also encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. The size of our future net losses will depend, in part, on the rate of future growth of our expenses and our ability to generate revenues, if any. Our commercial revenues, if any, will be derived from sales of products that we do not expect to be commercially available for several years, if at all. Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Additional financing may not be available to us on acceptable terms, or at all. Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders' equity and working capital.

Raising additional capital may cause significant dilution to our existing stockholders, reduce the trading price of our common stock, restrict our operations or require us to relinquish rights to our technologies or product candidates.

Until such time, if ever, as we can generate substantial product revenues, our ability to continue to operate our business, including our ability to advance our development programs, is dependent upon our ability to access additional capital through non-dilutive sources, including partnerships, collaborations, licensing, grants or other strategic relationships, and/or through the issuance of debt or equity securities (including any common stock issued to Aspire Capital pursuant to the July 2020 Aspire CSPA). Any issuance of equity or debt that could be convertible into equity would result in significant dilution to our existing stockholders. Debt financing, if available, may involve agreements that include covenants requiring that we place liens on some or all of our assets or limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures, effecting a change in control or declaring dividends. There can be no assurance that we will be able to obtain additional capital on terms acceptable to us, on a timely basis or at all.

Additionally, we have outstanding and exercisable warrants and options that if exercised may result in dilution to the interests of other stockholders and may reduce the trading price of our common stock. As of December 31, 2021, we have warrants to purchase approximately 1.3 million shares of common stock outstanding and exercisable with a weighted average exercise price of $37.24 per share. In addition, we had outstanding and exercisable options to purchase approximately 0.2 million shares of common stock as of December 31, 2021 with a weighted average exercise price of $26.59 per share.

We have entered into and rely on, and may enter into, engage in and rely on other, strategic relationships and transactions for the further development and commercialization of our product candidates and the expansion of our business, and if we are unable to enter into such relationships or transactions on favorable terms or at all, or if such are unsuccessful or if disputes arise between us and our strategic partners, we may be unable to realize the potential economic benefit of those product candidates.

We have entered into and rely on, and may enter into, engage in and rely on other, strategic relationships and transactions for the further development and commercialization of our product candidates and the expansion of our business. For example, in 2019 we entered into the Purchase Agreement with Reedy Creek and the Funding Agreement with Ligand, and we are currently exploring and intend to advance certain clinical-stage dermatological product candidates through partnerships, collaborations, acquisitions or other strategic relationships. In certain potential scenarios, the counterparty(ies) to such a strategic transaction may assume responsibility for the planning, execution, or oversight of the clinical development and regulatory requirements for the associated product candidates and/or the ultimate commercialization of the product candidates. If we decide to engage in such a transaction and, as a result, no longer have significant involvement or responsibility for late-stage clinical development activities or commercialization, we would adjust our business strategy, operating plans, resources and capabilities accordingly. Alternatively, we may pursue a transaction in which the counterparty agrees to finance the continued development of one or more product candidates in exchange for future milestone or royalty payments.

However, there can be no assurance that we will be able to establish or enter into such arrangements on favorable terms, if at all, or that our current or future arrangements will be successful. If we are unable to establish successful agreements with suitable partners, we would face significant incremental costs, we may be required to limit the scope and number of our product candidates we can commercially develop or the territories in which we commercialize them or we might fail to commercialize products or programs for which a suitable collaborator or arrangement cannot be found.

Any strategic relationship or transaction may entail numerous risks, including taking on indebtedness or contingent liabilities; the issuance of equity securities which would result in dilution to our stockholders; assimilation of acquired operations, intellectual property, products and product candidates, including difficulties associated with integrating new personnel; risks and uncertainties associated with the other party to such a transaction, and our inability to generate revenue from acquired intellectual property, technology, products or operations sufficient to meet our objectives or even to offset the associated transaction and maintenance costs. Additionally, our current and future collaboration partners may not dedicate sufficient resources to the development and commercialization of our product candidates or may otherwise fail in their development and commercialization due to factors beyond our control. If we breach or fail to comply with any provision of a strategic arrangement, a collaborator may have the right to terminate, in whole or in part, such agreement or to seek damages. Some of our strategic arrangements are complex and involve sharing of certain data, know-how and intellectual property rights amongst the parties. Additionally, these potential collaborators may not accept the transfer of critical methods and processes in order for development and commercialization work for our product candidates to take place. Our strategic partners could interpret certain provisions differently than we do, which could lead to unexpected or inadvertent disputes with such partners. Any one of our strategic partners could breach obligations, covenants or restrictions in our agreements, leading us into disputes and potential breaches of our agreements with other parties, which could have direct or indirect financial implications. If a strategic relationship terminates or is otherwise unsuccessful, we may need to identify and establish an alternative arrangement. This may not be possible, or we may not be able to do so on terms which are acceptable to us, in which case, it may be necessary for us to cease the development of the applicable product candidate or candidates, or conduct the remaining clinical development or commercialization on our own and with our own funds.

Our process of considering financial and strategic alternatives could adversely affect our business, financial condition, and results of operations.

We previously announced that we are in the process of considering financial and strategic alternatives to deliver value to our stockholders. Such alternatives might include, among other things, strategic acquisitions or in-licenses, out-licensing some or all of our product candidates, the sale of some or all of our assets, such as a sale of our dermatology platform assets, or a sale of our company, but there can be no assurance that we will be able to enter into such a transaction or transactions on a timely basis or at all or on terms that are favorable to us. We may pursue such alternatives at the same time as we seek to secure additional funding. This process could disrupt and create uncertainty concerning our business, regardless of whether we are able to obtain additional funding or complete any strategic alternatives, and poses other risks to our business, including:

- potential uncertainty in the marketplace concerning our ongoing viability as a business
- the possibility of disruption to our business and operations, including diversion of significant management time and resources towards the pursuit of funding and strategic alternatives

- impairment of our ability to attract and retain key personnel who are necessary to the operation of the business and the development of its product candidates
- restrictions on our business operations and ability to explore other strategic alternatives under any definitive agreement we may enter into as a result of this process; and
- potential future stockholder litigation relating to the strategic process that could prevent or delay the strategic process, and the related costs of such litigation.

If any of the foregoing risks were realized, our business, financial condition, and results of operations could be adversely affected.

The report of our independent registered public accounting firm on our consolidated financial statements for the year ended December 31, 2021, contains an explanatory paragraph regarding going concern, and we will need additional financing to execute our business plan, to fund our operations and to continue as a going concern.

Since inception, we have experienced recurring operating losses and negative cash flows and we expect to continue to generate operating losses and consume significant cash resources in the foreseeable future. These conditions raise substantial doubt about our ability to continue as a going concern without additional financing. As a result, our independent registered public accounting firm included explanatory paragraphs in its report on our 2021 consolidated financial statements, with respect to this uncertainty. Substantial doubt about our ability to continue as a going concern may materially and adversely affect the price per share of our common stock and we may have a more difficult time obtaining financing.

Risks Related to the Development and Regulatory Approval of our Current and Future Product Candidates

We may expend our limited resources to pursue one or more product candidates or indications within our product development strategy, which has and may continue to change over time, and thus fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we intend to focus on developing product candidates for specific indications that we identify as most likely to succeed, in terms of their potential both to gain regulatory approval and to achieve commercialization. As a result, we may forego or delay the pursuit of opportunities with other product candidates or in other indications with greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable product candidates. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to the product candidate.

We specialize solely in developing nitric oxide-based therapeutics to treat a range of diseases with significant unmet needs, and if we do not successfully achieve regulatory approval for any of our product candidates or successfully commercialize them, all of which is a lengthy and expensive process with uncertain timelines and outcomes, we may not be able to continue as a business.

Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure or delay can occur at any time during the clinical trial process. Success in preclinical testing and early clinical trials does not ensure that later clinical trials will be successful. A number of companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in clinical trials, even after obtaining promising results in earlier preclinical studies or clinical trials. These setbacks have been caused by, among other things, preclinical findings made while clinical trials were underway and safety or efficacy observations made in clinical trials, including previously unreported adverse events.

The results of preclinical studies and early clinical trials of our product candidates may not be predictive of the results of later-stage clinical trials. Product candidates in later stages of clinical trials may fail to show the required safety profile or meet the efficacy endpoints despite having progressed through preclinical studies and initial clinical trials. Notwithstanding any potential promising results in earlier testing, we cannot be certain that we will not face similar setbacks. Even if our clinical development is completed for any of our product candidates, the results may not be sufficient to obtain regulatory approval for our product candidates.

On June 11, 2021, we announced positive top-line results from the Phase 3 B-SIMPLE4 clinical trial for SB206 for the treatment of molluscum contagiosum; however, we cannot assure you that the results from B-SIMPLE4 or any additional clinical trials we may conduct for any of our other product candidates will achieve results that are sufficient to support an NDA

submission for the applicable product candidates or regulatory approval of the product. We also cannot assure you that we will be able to obtain financing sufficient to advance development of one or more of our product candidates. In addition, our ongoing or future preclinical studies may not prove successful in demonstrating proof-of concept, or may show adverse toxicological findings, and even, if successful, may not necessarily predict that subsequent clinical trials will show the requisite safety and efficacy of our product candidates. Moreover, all of our clinical development efforts to date have focused on the development of nitric oxide-based topical therapies. There can be no assurance that the intended or anticipated results from the use of nitric oxide-based therapies will be reaped, and that we, or our existing or potential future commercial partners, will successfully bring our product candidates to market. Because all of our current product candidates are based on nitric oxide and our Nitricil technology, the failure of our Nitricil technology to be safe or efficacious generally will have adverse implications for our entire product candidate pipeline. If, for any reason, our intended use of nitric oxide does not materialize, we may not be able to redeploy our resources to alternative components or raw materials, efficiently or at all.

Delay or termination of planned clinical trials for our product candidates would result in unplanned expenses and significantly adversely impact our remaining developmental activities and potential commercial prospects with respect to, and ability to generate revenues from, such product candidates.

We may experience delays in completing ongoing trials and initiating planned trials and we cannot be certain whether these trials or any other future clinical trials for our product candidates will begin on time, need to be redesigned, enroll an adequate number of patients on time or be completed on schedule, if at all. Clinical trials can be delayed or terminated for a variety of reasons, including delays or failures related to:

- the FDA disagreeing as to the design or implementation of our clinical trials;
- reaching agreement on acceptable terms with prospective CROs, clinical trial sites and prospective strategic partners, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs, trial sites and partners;
- obtaining institutional review board, or IRB, approval at each site;
- adverse events occurring in clinical studies of our product candidates;
- recruiting suitable patients to participate in a trial;
- having patients complete a trial or return for post-treatment follow-up;
- clinical sites deviating from trial protocol;
- how we address patient safety concerns that arise during the course of a trial;
- adding a sufficient number of clinical trial sites;
- manufacturing sufficient quantities of product candidate for use in clinical trials;
- utilizing an adequate container and delivery device for the product candidate; or
- changes to our financial priorities or insufficient capital available to fund clinical trials.

In addition, disruptions caused by the COVID-19 pandemic may increase the likelihood that we encounter such difficulties or delays in initiating, enrolling, conducting or completing our clinical trials. We could also encounter delays if a clinical trial is suspended or terminated by us, by the IRBs of the institutions in which such trials are being conducted, by the Data Safety Monitoring Board, or DSMB, for such trial or by the FDA or other regulatory authorities for a variety of reasons.

If we encounter difficulties or delays enrolling patients in our clinical trials, our clinical development activities would be delayed or otherwise adversely affected.

The timely completion of clinical trials in accordance with their protocols depends on, among other things, the ability to enroll a sufficient number of patients who remain in the trial until its conclusion. The enrollment of patients depends on many factors, including:

- the patient eligibility criteria defined in the protocol;
- the size of the patient population required for analysis of the trial's primary endpoints;
- the proximity of patients to trial sites;
- the design of the trial;
- our ability to recruit clinical trial investigators with the appropriate competencies and experience;

- clinicians' and patients' perceptions as to the potential advantages of the product candidate being studied in relation to other available therapies, including any new drugs that may be approved for the indications we are investigating;
- our ability to obtain patient consents; and
- the risk that patients enrolled in clinical trials will drop out of the trials before completion.

In addition, our clinical trials may compete for the recruitment of patients with other clinical trials for product candidates that are in the same therapeutic areas as our product candidates, and this competition may reduce the number and types of patients available to us, to the extent patients who might have opted to enroll in our trials instead opt to enroll in a trial being conducted by one of our competitors.

If we experience delays in enrollment for or the completion, or termination, of our clinical trials for our product candidates, we may experience increased costs, have difficulty raising capital through non-dilutive or dilutive sources, and have to slow down our product candidate development and regulatory approval process timelines. Further, the commercial prospects of our product candidates may be harmed and our ability to generate product revenues from any of these product candidates could be delayed or not realized at all. 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.

We rely on third parties to conduct some of our preclinical studies and our clinical trials. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, or are adversely impacted by the COVID-19 pandemic, we may be unable to obtain regulatory approval for or commercialize any of our product candidates.

We currently do not have the ability to independently conduct preclinical studies that comply with the regulatory requirements known as good laboratory practice, or GLP, requirements. We also do not currently have the ability to independently conduct any clinical trials. The FDA and regulatory authorities in other jurisdictions require us to comply with regulations and standards, commonly referred to as good clinical practice, or GCP, requirements for conducting, monitoring, recording and reporting the results of clinical trials, in order to ensure that the data and results are scientifically credible and accurate and that the trial subjects are adequately informed of the potential risks of participating in clinical trials. We rely on medical institutions, clinical investigators, contract laboratories and other third parties, such as CROs, to conduct GLP-compliant preclinical studies and GCP-compliant clinical trials on our product candidates properly and on time. While we will have agreements governing their activities, we control only certain aspects of their activities and have limited influence over their actual performance. The third parties with whom we contract for execution of our GLP preclinical studies and our GCP clinical trials play a significant role in the conduct of these studies and trials and the subsequent collection and analysis of data. These third parties are not our employees and, except for restrictions imposed by our contracts with such third parties, we have limited ability to control the amount or timing of resources that they devote to our programs. Although we rely on these third parties to conduct our GLP-compliant preclinical studies and GCP-compliant clinical trials, we remain responsible for ensuring that each of our GLP preclinical studies and GCP clinical trials is conducted in accordance with its investigational plan and protocol and applicable laws and regulations, and our reliance on the third parties does not relieve us of our regulatory responsibilities. In addition, if any of our third parties terminate their involvement with us for any reason, we may not be able to enter into similar arrangements with alternative third parties within a short period of time or do so on commercially reasonable terms.

Many of the third parties with whom we contract may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials or other drug development activities that could harm our competitive position. In addition, since the number of qualified clinical investigators is limited, we expect to conduct some of our clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials in such clinical trial site. If the third parties conducting our GLP preclinical studies or our GCP clinical trials do not perform their contractual duties or obligations, experience work stoppages, do not meet expected deadlines, terminate their agreements with us or need to be replaced, or if the quality or accuracy of the clinical data they obtain is compromised due to their failure to adhere to our clinical trial protocols, GLPs or GCPs, or for any other reason, we may need to enter into new arrangements with alternative third parties. This could be difficult, costly or impossible, and our preclinical studies or clinical trials may need to be extended, delayed, terminated or repeated. As a result, we may not be able to obtain regulatory approval in a timely fashion, or at all, for the applicable product candidate, our financial results and the commercial prospects for our product candidates would be harmed, our costs could increase, and our ability to generate revenues could be delayed.

In addition, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and may receive cash or equity compensation in connection with such services. If these relationships and any related compensation result in perceived or actual conflicts of interest, or the FDA concludes that the financial relationship may have

affected the interpretation of the trial, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized, which could result in the delay or rejection by the FDA of any NDA we submit. Any such delay or rejection could prevent us from commercializing our future product candidates.

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

We, any partner with whom we may collaborate in the future, or the FDA may suspend, delay, require modifications to or terminate our clinical trials at any time, for various reasons, including the discovery of serious or unexpected toxicities or other safety issues experienced by trial participants. In addition, adverse events 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 approval by the FDA or comparable foreign regulatory authorities. Results of our clinical trials could reveal a high and unacceptable severity and prevalence of adverse events or unexpected characteristics. To date, patients treated with our product candidates have experienced instances of drug-related cutaneous intolerability observations, including dryness, scaling, burning, erythema, itching, pain or irritation, and adverse events, including irritation and contact dermatitis.

If safety issues or unacceptable adverse events arise in the development of our product candidates, we, the FDA, the IRBs at the institutions in which our trials are conducted, or the DSMB could suspend or terminate our clinical trials or the FDA or comparable foreign regulatory authorities could order us to cease clinical trials or deny approval of our product candidates for any or all targeted indications. Treatment-related adverse events could also affect patient recruitment or the ability of enrolled patients to complete the trial or result in potential product liability claims. In addition, these adverse events may not be appropriately recognized or managed by the treating medical staff. Any of the foregoing events could prevent us from achieving or maintaining market acceptance of the particular product candidate, if approved, and may result in the loss of significant revenues to us, which would materially and adversely affect our results of operations and business.

The regulatory approval processes of the FDA are lengthy, time-consuming and inherently unpredictable and have been and may be disrupted by the COVID 19 pandemic, and if we, or a potential future partner, are ultimately unable to obtain regulatory approval for our product candidates on a timely basis or at all, our business will be substantially harmed.

The time required to obtain approval by the FDA is unpredictable but typically takes many years following the commencement of clinical trials and depends upon numerous factors, including the substantial discretion of the regulatory authorities. In addition, approval policies, regulations, or the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions. We have not obtained regulatory approval for any product candidate and it is possible that none of our existing product candidates or any product candidates we may seek to develop in the future ourselves or with a potential future strategic partner will ever obtain regulatory approval. Neither we nor any future collaborator is permitted to market any of our product candidates in the United States until we receive regulatory approval of an NDA from the FDA.

Prior to obtaining approval to commercialize a product candidate in the United States or abroad, we or our collaborators must demonstrate with substantial evidence from well-controlled clinical trials, and to the satisfaction of the FDA or foreign regulatory authorities, that such product candidates are safe and effective for their intended uses. Results from preclinical studies and clinical trials can be interpreted in different ways. Even if we believe the preclinical or clinical data for our product candidates are promising, such data may not be sufficient to support approval by the FDA and other regulatory authorities. For example, there are multiple methodologies for handling missing data and other statistical considerations to take into account that the FDA may utilize when analyzing the robustness of any data set during NDA review. The FDA may also require us to conduct additional preclinical studies or clinical trials for our product candidates either prior to or post-approval, or it may object to elements of our clinical development program.

The FDA can delay, limit or deny approval of our product candidates or require us to conduct additional preclinical or clinical testing or abandon a program for many reasons, including:

- the FDA's disagreement with the design or implementation of our clinical trials;
- unfavorable or ambiguous results from our clinical trials;
- results that may not meet the level of statistical significance required by the FDA for approval;
- serious and unexpected drug-related adverse events experienced by participants in our clinical trials or by individuals using drugs similar to our product candidates;

- our inability to demonstrate to the satisfaction of the FDA that our product candidates are safe and effective for the proposed indication;
- the FDA's disagreement with the interpretation of data from preclinical studies or clinical trials;
- our inability to demonstrate that the clinical and other benefits of our product candidates outweigh any safety or other perceived risks;
- the FDA's requirement for additional preclinical studies or clinical trials;
- the FDA's disagreement regarding the formulation, container, dosing delivery device, labeling or the specifications of our product candidates;
- the FDA's failure to approve the manufacturing processes or facilities of third-party manufacturers with which we contract; or
- the potential for approval policies or regulations of the FDA to significantly change in a manner rendering our clinical data insufficient for approval.

Of the large number of drugs in development, only a small percentage successfully complete the FDA approval process and become commercialized. The lengthy approval process as well as the unpredictability of outcomes from future clinical trials may result in our failing to obtain regulatory approval to market our product candidates.

Even if we or a potential future partner, eventually complete clinical testing and receive approval of an NDA or foreign marketing application for our product candidates, the FDA may grant approval contingent on the performance of costly additional clinical trials, including Phase 4 clinical trials, or the implementation of a Risk Evaluation and Mitigation Strategy, or REMS, which may be required to ensure safe use of the drug after approval. The FDA also may approve a product candidate for a more limited indication or patient population than we originally requested, and the FDA may not approve the labeling that we believe is necessary or desirable for the successful commercialization of a product candidate. Any delay in obtaining, or inability to obtain, applicable regulatory approval would delay or prevent commercialization of that product candidate.

We may seek EUAs from the FDA or comparable emergency authorizations, including with respect to SB019, if it is successfully developed. The FDA has the authority to issue an EUA under certain circumstances, such as during a public health emergency, pursuant to a declaration by the Secretary of the Department of Health and Human Services, or HHS, that an emergency exists justifying the issuance of EUAs for certain types of products (referred to as EUA declarations). On March 27, 2020, the Secretary of HHS declared that circumstances exist justifying authorization of drugs and biologics during the COVID-19 pandemic, subject to the terms of any EUA that is issued for a specific product.

Once an EUA declaration has been issued, the FDA can issue EUAs for products that fall within the scope of that declaration. To issue an EUA, the FDA Commissioner must conclude that (1) the CBRN that is referred to in the EUA declaration can cause serious or life-threatening diseases or conditions; (2) based on the totality of scientific evidence available, it is reasonable to believe that the product may be effective in diagnosing, treating, or preventing the disease or condition attributable to the CBRN and that the product's known and potential benefits outweigh its known and potential risks; and (3) there is no adequate, approved, and available alternative to the product.

The FDA's standards for granting an EUA are lower than for approving an NDA in accordance with traditional review procedures, and even if we seek and obtain an EUA for one or more of our product candidates, we cannot assure you that the FDA would approve an NDA for such product candidate, if such approval is required. Accordingly, even if we obtain an EUA for one or more of our product candidates, we may be required to conduct additional clinical trials before we are able to submit NDAs or comparable marketing applications for such product candidates.

In addition, the authorization to market products under an EUA is limited to the period of time the EUA declaration is in effect, and the FDA can revoke an EUA in certain circumstances. The FDA's policies regarding EUAs can change unexpectedly. We cannot predict how long any authorization, if obtained, will remain in place. The FDA's policies regarding products used to diagnose, treat or mitigate COVID-19 remain in flux as the FDA responds to new and evolving public health information and clinical evidence. Therefore, even if we are able to obtain an EUA or other authorizations for one or more of our product candidates, it is possible that such EUAs or authorizations may be revoked and we may be required to cease any commercialization activities, which would adversely impact our business, financial condition and results of operations.

Disruptions at the FDA 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, or otherwise prevent new or modified products from being developed, approved, or commercialized in a timely manner, or at all, which could negatively impact our business.

The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels, the 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 FDA have fluctuated in recent years as a result. In addition, government funding of other government agencies 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 new drugs or modifications to approved drugs to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA 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.

Separately, in response to the COVID-19 pandemic, in March 2020, the FDA announced its intention to postpone most inspections of foreign manufacturing facilities, and on March 18, 2020, the FDA temporarily postponed routine surveillance inspections of domestic manufacturing facilities. Subsequently, in July 2020, the FDA resumed certain on-site inspections of domestic manufacturing facilities subject to a risk-based prioritization system. The FDA utilized this risk-based assessment system to assist in determining when and where it was safest to conduct prioritized domestic inspections. Additionally, on April 15, 2021, the FDA issued a guidance document in which the FDA described its plans to conduct voluntary remote interactive evaluations of certain drug manufacturing facilities and clinical research sites, among other facilities. According to the guidance, the FDA may request such remote interactive evaluations where the FDA determines that remote evaluation would be appropriate based on mission needs and travel limitations. In May 2021, the FDA outlined a detailed plan to move toward a more consistent state of inspectional operations, and in July 2021, the FDA resumed standard inspectional operations of domestic facilities and was continuing to maintain this level of operation as of September 2021. More recently, the FDA has continued to monitor and implement changes to its inspectional activities to ensure the safety of its employees and those of the firms it regulates as it adapts to the evolving COVID-19 pandemic. Regulatory authorities outside the United States may adopt similar restrictions or other policy measures in response to the COVID-19 pandemic. If a prolonged government shutdown occurs, or if global health concerns continue to 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.

Interim, top-line or preliminary data from our clinical trials that we announce or publish from time to time may change as more patient 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 publicly disclose interim, top-line, or preliminary data from our clinical trials, which are based on a preliminary analysis of then-available data, and the results and related findings and conclusions are subject to change following a full analyses of all data related to the particular trial. 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 interim, top-line, or preliminary results that we report may differ from future results of the same trials, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Top-line and preliminary 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, top-line and preliminary data should be viewed with caution until the final data are available.

We may also disclose interim data from our clinical trials. 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 interim, top-line, or preliminary data and final data could significantly harm our business prospects.

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 business in general. 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 you or others may not agree with what we determine is the material or otherwise

appropriate information to include in our disclosure, and any information we determine not to disclose may ultimately be deemed significant with respect to future decisions, conclusions, views, activities or otherwise regarding a particular drug, product candidate or our business. If the interim, top-line, or preliminary data that we report differ from actual results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain approval for and commercialize our product candidates, our business, operating results, prospects or financial condition may be harmed.

Regulatory approval of our product candidates by foreign regulatory authorities may be delayed or denied. We, or our current or potential future partners, may be subject to pricing controls imposed by foreign governments and regulatory authorities.

We, or any current or potential future partners, may seek regulatory approval of our product candidates from foreign regulatory authorities. Such regulatory authorities may impose additional regulations and guidelines that differ in form and substance from those imposed by their counterparts in the United States and with which we are more familiar. Accordingly, the regulatory approval of our product candidates in those foreign jurisdictions could be delayed, limited or denied altogether. This could limit the scope of or prevent the commercialization of our products in the future and adversely affect our financial performance. Further, in some countries, the pricing of pharmaceutical prescriptions is subject to governmental control, including, for example, Japan. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a product candidate. In addition, there can be considerable pressure by governments and other stakeholders on prices and reimbursement levels, including as part of cost containment measures. Political, economic and regulatory developments may further complicate pricing negotiations, and pricing negotiations may continue after coverage and reimbursement have been obtained. Reference pricing used by various countries and parallel distribution or arbitrage between low-priced and high-priced countries can further reduce prices. To obtain reimbursement or pricing approval in some countries, we or our current or potential future partners may be required to conduct a clinical trial that compares the cost-effectiveness of our product candidate to other available therapies, which is time-consuming and costly. If coverage and reimbursement of our product candidates are unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business could be harmed.

We may face product liability exposure, and if successful claims are brought against us, we may incur substantial liability if our insurance coverage for those claims is inadequate.

We face an inherent risk of product liability as a result of the clinical testing of our product candidates and will face an even greater risk if we commercialize any products. This risk exists even if a product is approved for commercial sale by the FDA or an applicable foreign regulatory authority and manufactured in facilities licensed and regulated by the FDA or an applicable foreign regulatory authority. Our product candidates are designed to affect important bodily functions and processes. Any adverse events, manufacturing defects, misuse or abuse associated with our product candidates could result in injury to a patient or even death. We cannot offer any assurance that we will not face product liability suits in the future, nor can we assure you that our insurance coverage will be sufficient to cover our liability under any such cases. In addition, a liability claim may be brought against us even if our product candidates merely appear to have caused an injury. Product liability claims may be brought against us by consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with our product candidates, among others. If we cannot successfully defend ourselves against product liability claims we will incur substantial liabilities and reputational harm. In addition, regardless of merit or eventual outcome, product liability claims may result in circumstances that are materially adverse to our business, including:

- withdrawal of clinical trial participants;
- decreased enrollment rates of clinical trial participants;
- termination of clinical trial sites or entire trial programs;
- the inability to commercialize our product candidates;
- decreased demand for our product candidates;
- impairment of our business reputation;
- product recall or withdrawal from the market or labeling, marketing or promotional restrictions;
- substantial costs of any related litigation or similar disputes;
- distraction of management's attention and other resources from our primary business;
- substantial monetary awards to patients or other claimants against us that may not be covered by insurance; or
- loss of revenue.

We have obtained product liability insurance coverage, with an aggregate limit of $10,000,000, for clinical trials. Large judgments have been awarded in class action or individual lawsuits based on drugs that had unanticipated adverse events. Our insurance coverage may not be sufficient to cover all of our product liability related expenses or losses and may not cover us for any expenses or losses we may suffer. Moreover, insurance coverage is becoming increasingly expensive, and, in the future, we may not be able to maintain insurance coverage at a reasonable cost, in sufficient amounts or upon adequate terms to protect us against losses due to product liability. We will need to increase our product liability coverage if any of our product candidates receive regulatory approval, which will be costly, and we may be unable to obtain this increased product liability insurance on commercially reasonable terms, or at all. A successful product liability claim or series of claims brought against us could cause our stock price to decline and, if judgments exceed our insurance coverage, could decrease our cash, negatively impact our statement of operations and harm our financial condition.

Risks Related to the Potential Future Commercialization of Our Product Candidates, if such Product Candidates Complete Development and Receive Regulatory Approval

Our product candidates, if approved, will face significant competition and our failure to effectively compete may prevent us from achieving significant market penetration.

The pharmaceutical industry and the markets in which our approved product candidates, if any, would compete are characterized by rapidly advancing technologies, intense competition and a strong emphasis on developing proprietary therapeutics. Numerous companies are engaged in the development, patenting, manufacturing and marketing of healthcare products competitive with those that we are developing. We face competition from a number of sources, such as pharmaceutical companies, generic drug companies, biotechnology companies and academic and research institutions, many of which have greater financial resources, marketing capabilities, sales forces, manufacturing capabilities, research and development capabilities, clinical trial expertise, intellectual property portfolios, experience in obtaining patents and regulatory approvals for product candidates and other resources than we do. Some of the companies that offer competing products also have a broad range of other product offerings, large direct sales forces and long-term customer relationships with our target physicians, which could inhibit our market penetration efforts. In addition, certain of our product candidates, if approved, may compete with other products, including OTC treatments, for a share of some patients' discretionary budgets and for physicians' attention within their clinical practices. To compete successfully in the marketplace, our approved products, if any, will have to demonstrate that the relative cost, safety and efficacy of such products provide an attractive alternative to existing and other new therapies. Such competition could lead to reduced market share for our product candidates and contribute to downward pressure on the pricing of our product candidates.

Due to less stringent regulatory requirements in certain foreign countries, there are many more products and procedures available for use in those international markets than are approved for use in the United States. In certain international markets, there are also fewer limitations on the claims that our competitors can make about the effectiveness of their products and the manner in which they can market them. As a result, we expect our product candidates will face more competition in these markets than in the United States.

If we are unable to establish sales, marketing and distribution capabilities for our product candidates or any future product candidate that receives regulatory approval, either through a commercial partner or internally, we may not be successful in commercializing and generating potential revenues from those product candidates, if approved.

While we have hired key senior level management positions to oversee and lead our commercial efforts, we do not currently have a sales, marketing or distribution infrastructure in place. To achieve commercial success for any product candidate for which we may obtain marketing approval, we will need to establish a sales, marketing and distribution framework internally or through a commercial partner or other form of strategic relationship for commercialization. We may build or acquire a focused sales, marketing and distribution infrastructure to market any of our product candidates in the United States. There are risks involved with establishing our own sales, marketing and distribution capabilities. For example, recruiting and training a sales force is expensive and time-consuming and could delay market uptake. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we cannot retain or reposition our sales and marketing personnel.

Factors that may inhibit our efforts to commercialize our products on our own include:

- our inability to recruit, train and retain adequate numbers of effective sales and marketing personnel;
- the inability of sales personnel to obtain access to physicians or persuade adequate numbers of physicians to prescribe any future products;

- the lack of complementary products to be offered by sales personnel, which may put us at a competitive disadvantage relative to companies with more extensive product lines; and
- unforeseen costs and expenses associated with creating an independent sales and marketing organization.

We may enter into arrangements with third parties to perform sales, marketing and distribution services, which could decrease our revenue and our profitability. In addition, we may not be successful in entering into such arrangements with third parties or may be unable to do so on terms that are favorable to us. We may not have adequate control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market our products effectively. In addition, such third parties will be subject to the commercialization risks described above. If we do not establish sales, marketing and distribution capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing our product candidates.

Additionally, we have entered into an exclusive license agreement in Japan with Sato relating to SB204 and SB206 for the treatment of acne vulgaris and viral skin infections, respectively, and we expect to continue to evaluate strategic partnerships to commercialize our dermatology products in select international markets. We may not be sufficiently familiar or have the requisite resources to penetrate international markets where some of our competitors have already achieved broad recognition and have established commercialization strategies in place. Moreover, we may not succeed in targeting healthcare providers, including physicians, who may not be familiar with our product candidates.

Even if our current product candidates or any future product candidates obtain regulatory approval, they may fail to achieve the broad degree of physician and patient adoption and use necessary for commercial success.

The commercial success of any of our current or future product candidates, if approved, will depend significantly on the broad adoption and use of the resulting product by physicians and patients for approved indications. Our product candidates may not be commercially successful. The degree and rate of physician and patient adoption of our current or future product candidates, if approved, will depend on a number of factors, including:

- the clinical indications for which the product is approved and patient demand for approved products that treat those indications;
- the effectiveness of our product as compared to other available therapies;
- the availability of coverage and adequate reimbursement from managed care plans and other healthcare payors for any of our product candidates that may be approved;
- the cost of treatment with our product candidates in relation to alternative treatments and willingness to pay for the product, if approved, on the part of patients;
- acceptance by physicians, major operators of clinics and patients of the product as a safe and effective treatment;
- physician and patient willingness to adopt a new therapy over other available therapies to treat approved indications;
- overcoming any biases physicians or patients may have toward particular therapies for the treatment of approved indications;
- patient satisfaction with the results and administration of our product candidates and overall treatment experience;
- the willingness of patients to pay for certain of our product candidates relative to other discretionary items, especially during economically challenging times;
- the revenue and profitability that our product candidates may offer a physician as compared to alternative therapies;
- the prevalence and severity of adverse events;
- limitations or warnings contained in the FDA-approved labeling for our product candidates;
- any FDA requirement to undertake a REMS;
- the effectiveness of our sales, marketing and distribution efforts;
- adverse publicity about our product candidates or favorable publicity about competitive products; and
- potential product liability claims.

If any of our current or future product candidates are approved for use but fail to achieve the broad degree of physician and patient adoption necessary for commercial success, our operating results and financial condition will be adversely affected, which may delay, prevent or limit our ability to generate revenue and continue our business.

If we, or a potential future partner, receive regulatory approval to market any of our product candidates, our relationships with healthcare providers, customers and third-party payors, as well as our general business operations, may be subject to applicable anti-kickback, fraud and abuse and other healthcare laws and regulations, and failure to comply with such regulations could expose us to penalties including criminal sanctions, civil penalties, exclusion from government healthcare programs, contractual damages, reputational harm and diminished profits and future earnings.

Healthcare providers, customers and third-party payors will play a primary role in the recommendation and prescription of any product candidates for which we, or a potential future partner, may obtain marketing approval. Future arrangements with third-party payors, healthcare providers and customers and general operations may expose us, or a potential future partner, to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we, or a potential future partner, market, sell and distribute any product candidates for which we, or a potential future partner, obtain marketing approval. Restrictions under applicable federal and state healthcare laws and regulations may include the following:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons and entities from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made, in whole or in part, under a federal healthcare program such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the federal Anti-Kickback Statute or specific intent to violate it in order to have committed a violation.
- the federal false claims laws, including the civil False Claims Act, which impose criminal and civil penalties, including through civil whistleblower or *qui tam* actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government; in addition, the government may assert that a claim including items and services resulting from a violation of the United States federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which imposes criminal and civil liability for, among other things, executing or attempting to execute a scheme to defraud any healthcare benefit program or making false 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;
- the federal Physician Payments Sunshine Act, which requires manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the government information related to certain payments or other ''transfers of value'' made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), certain non-physician practitioners such as physician assistants and nurse practitioners, and teaching hospitals, and requires applicable manufacturers to report annually to the government ownership and investment interests held by the physicians described above and their immediate family members; and
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, which may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government; and state laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or report marketing expenditures and pricing information.

Efforts to ensure that our internal operations and business arrangements with third parties comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. The risk of our being found in violation of these laws is increased by the fact that many of them have not been fully interpreted by the regulatory authorities or the courts, and their provisions are open to a variety of interpretations. Because of the breadth of these laws and the narrowness of the statutory exceptions and safe harbors available under such laws, it is possible that some of our business activities, including our relationships with physicians and other healthcare providers, some of whom will recommend, purchase or prescribe our products, could be subject to challenge under one or more of such laws.

If our operations are found to be in violation of any of these laws or any other governmental laws and regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment,

exclusion of products from government funded healthcare programs, such as Medicare and Medicaid, disgorgement, contractual damages, reputational harm, diminished profits and the curtailment or restructuring of our operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs, which would adversely impact our statement of operations and cash flows.

Our product candidates may cause side effects which could delay or prevent their commercialization.

If any of our product candidates receives marketing approval, and we or other companies developing other nitric oxide-based therapies, later identify undesirable side effects caused by such products, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw their approval of the product;
- we may be required to recall a product or change the way such product is administered to patients;
- additional restrictions may be imposed on the marketing of the particular product or the manufacturing processes for the product or any component thereof;
- regulatory authorities may require the addition of labeling statements, such as a ‘‘black box’’ warning or a contraindication;
- we may be required to implement a REMS or create a Medication Guide outlining the risks of such adverse events for distribution to patients;
- we could be sued and held liable for harm caused to patients;
- the product may become less competitive; and
- our reputation may suffer.

We expect to educate and train medical personnel so they know how to use our product candidates to understand their potential side effect profiles. Inadequate training in recognizing or managing the potential side effects of our product candidates could result in patient injury.

Even if any of our product candidates obtain marketing approval, the products may become subject to unfavorable third-party coverage or reimbursement policies, which would harm our business.

The success of our product candidates, if approved, depends on the availability of adequate coverage and reimbursement from government authorities and third-party payors, such as private health insurers and health maintenance organizations. Patients who are provided medical treatment for their conditions generally rely on third-party payors to reimburse all or part of the costs associated with their treatment. Adequate coverage and reimbursement from governmental healthcare programs, such as Medicare and Medicaid, and commercial payors is critical to product acceptance.

Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which drugs and treatments they will cover and the amount of reimbursement that will be provided. Coverage decisions may depend on clinical and economic standards that disfavor new products when more established or lower cost therapeutic alternatives are already available or subsequently become available. Third-party payors may refuse to include a particular branded product in their formularies or lists of medications for which third-party payors provide coverage and reimbursement, or otherwise restrict patient access through formulary controls or otherwise to a branded product when a less costly generic equivalent or alternative is available. Coverage may be more limited than the purposes for which a product is approved by the FDA or similar regulatory authorities outside the United States.

Assuming that we obtain coverage for a given product, the resulting reimbursement rates might not be adequate to cover our costs, including research, development, manufacture, sale and distribution, or achieve or sustain profitability, or may require co-payments that patients find unacceptably high. Patients are unlikely to use our products unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our product candidates. Increasingly, third-party payors are requiring that pharmaceutical companies provide them with predetermined discounts from list prices and are challenging the prices charged for products. There is significant uncertainty related to insurance coverage and reimbursement of newly approved products. It is difficult to predict at this time what third-party payors will decide with respect to the coverage and reimbursement for our product candidates.

In the United States, no uniform policy of coverage and reimbursement for products exists among third-party payors. Therefore, coverage and reimbursement for a product can differ significantly from payor to payor. As a result, obtaining and maintaining

coverage and reimbursement for a product from a government or other third-party payor is a time-consuming and costly process that could require us to provide supporting scientific, clinical and cost-effectiveness data for the use of our products to each payor separately, with no assurance that adequate coverage and reimbursement will be applied consistently or obtained in the first instance.

Governmental and third-party payors in the United States and abroad are developing increasingly sophisticated methods of controlling healthcare costs. Further, we believe that future coverage and reimbursement will likely be subject to increased restrictions both in the United States and in international markets. Third-party coverage and reimbursement for our product candidates for which we may receive regulatory approval may not be available, limited, or adequate in either the United States or international markets.

Risks Related to Our Operations and Manufacturing

Delays or disruptions in the qualification of manufacturing facilities and processes or in the manufacture of our (i) APIs, including NVN1000 or any other Nitricil NCEs, or (ii) clinical trial materials or commercial supplies of any approved product candidates, whether by us or any third-party manufacturer with whom we contract, including any delays in the transfer of technology to such manufacturers, could adversely affect our development and commercialization timelines and result in increased costs of our development programs or in our breaching our obligations to others.

We have internally manufactured the NVN1000 API, one of our Nitricil NCEs, for all of our current clinical stage product candidates, and at this stage, we intend to pursue a dual strategy of identifying and designating a partner to become the primary third-party external supplier of our proprietary berdazimer sodium (NVN1000) drug substance to support short-term and long-term manufacturing needs, while continuing internal capabilities to provide optionality and support certain small-scale and short-term manufacturing needs. Any delays or disruptions in our third-party manufacturers performing and completing the required technology transfer of the manufacturing processes and analytical methods for API development and commercial manufacturing under cGMP guidelines and regulations, or our inability to deliver such capabilities internally, could impact the development and commercialization timelines of our product candidates, as well as increase costs. Further, if we do not appropriately coordinate with, project manage, or provide adequate internal expertise, resources and documentation to a third-party API manufacturer, we may not be successful, or may be delayed, in transferring the activities, processes, capabilities and services. For example, in 2021, we entered into development services agreements with third-party full-scale API manufacturers for certain manufacturing process feasibility services including process familiarization, safety assessments, preliminary engineering studies, and initial process and analytical methods determination. Following the successful completion of such preliminary activities with a third-party API manufacturer and other preparatory activities, we would then plan to proceed with a third-party API manufacturer beyond the initial stages noted above, in which case we would expect to incur substantial costs associated with technical transfer efforts, capital expenditures, manufacturing capabilities, and ultimately, potential large-scale commercial quantities of our drug substance. If we are not able to successfully complete the stages noted above, we will need to be able to produce sufficient quantities of API internally in order to support an NDA submission for SB206 and, if approved, material to support a commercial launch. For example, we have a limited number of personnel who have experience in drug substance manufacturing and possess the expertise necessary to manufacture NVN1000.

We believe increased utilization of and reliance upon third-party vendors and strategic partners for the performance of activities, processes and services can ultimately provide enhanced capabilities and operating efficiencies for us and any potential partnerships, collaborations, licensing or other strategic relationships we may enter. However, there can be no assurance that the technology transfer process with any of these potential API manufacturing partners, or with Orion, with whom we have formed a strategic alliance to enable Orion to manufacture our topical nitric oxide-releasing product candidates on our behalf and on behalf of our global strategic partners, will be successful or that it will take place within the time period needed to meet our targeted timeframe for an SB206 NDA submission. For instance, we may not be successful in realizing the intended operating efficiencies from these arrangements based on a number of factors, including (i) delays or failures, including delays in our ability to transition applicable technology and processes to our vendors or partners, (ii) reduced quality, (iii) delayed receipt of goods or services, (iv) increased and unexpected costs on the part of the third-party vendors or strategic partners, and (v) certain incremental and discrete costs to effect this strategy upon resumption of the manufacturers' transfer activities. If we are unsuccessful in partnering with third-party manufacturers, we could experience delays in the development and commercialization timelines of our product candidates, as well as increased costs, in connection with shifting a greater portion of manufacturing to our internal resources or entering into new third party manufacturing arrangements.

Additionally, to date, we and our third party manufacturers have only manufactured SB206 in limited quantities in batch sizes appropriate for our clinical trials and registration batches to support the NDA submission, for which batch sizes are a fraction of the size we expect will be necessary for commercialization. The manufacturing processes for commercial scale are in development and have not been fully tested and the process validation requirement has not yet been satisfied. There are risks associated with scaling up manufacturing to commercial volumes including, among others, cost overruns, technical or other

problems with process scale-up, process reproducibility, stability issues, lot consistency and timely availability of raw materials. There is no assurance that our manufacturers will be successful in establishing a larger-scale commercial manufacturing process for SB206, if approved, that achieves our objectives for manufacturing capacity and cost of goods, in a timely manner, or at all.

The FDA requires API and finished drug product to be manufactured in accordance with cGMP and be approved by the FDA pursuant to inspections that will be conducted after we, or a potential future partner, submit an NDA to the FDA. Orion has been inspected by the FDA and other foreign regulatory authorities, and we anticipate that any future third-party API manufacturer will have been similarly inspected, but future inspections could identify findings that could require remediation actions and cause delays to our regulatory approval process. Additionally, in connection with developing our internal capabilities, we are required to qualify such space with the FDA to use it for small-scale manufacturing in order to ensure a safe operating environment, which will need to be evaluated by outside vendors. The tests performed by outside vendors include raw materials and product handling, process chemistry, air quality and waste disposal and containment. If our facilities, or the facilities of a third-party manufacturer, are found to be noncompliant with our specifications and the strict regulatory requirements of the FDA or others, we or our third-party manufacturers may be required to take remedial actions, causing further delays and increased costs. Moreover, the timing for conducting and reporting any results of such FDA inspections may be delayed or otherwise impacted by the COVID-19 pandemic.

In addition, except for the terms and conditions specified in our contractual arrangements with our contract manufacturers, we have no control over the ability of our contract manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority does not approve these facilities for the manufacture of our API or drug products or if it withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our product candidates, if approved.

If our existing inventories of API are depleted or damaged, we may be unable to supply necessary materials for preclinical studies and clinical trials or for registration batches, causing longer timelines, increased costs and delays in the development and commercialization of drug products, if approved by the FDA or other regulatory authorities. We currently contract with multiple labeling and packaging materials suppliers for our finished drug products. If we or our labeling and packaging materials suppliers were unable to manufacture and provide the necessary drug product supplies to conduct our clinical trials, we may not be able to contract with another third party in a timely manner to meet our product candidate specifications and supply needs. As a result, we could experience delays in the development and future commercialization timelines, if approved, of our product candidates, as well as increased costs.

The continuing effects of the COVID-19 pandemic have had an impact on our business operations and clinical trials and could continue, directly or indirectly, to adversely affect our business, results of operations and financial condition.

As a result of the outbreak of SARS-CoV-2, the virus that causes COVID-19, we may experience disruptions that could impact our supply chain, our clinical trials and our work to develop commercialization plans for SB206. To the extent our suppliers and third party manufacturers are unable to comply with their obligations under our agreements with them or supply chain or other disruptions cause them to be unable to deliver or are delayed in delivering raw materials, API or drug products to us due to COVID-19, our ability to pursue regulatory approval, implement our commercialization efforts for SB206, if approved, or advance development of our product candidates may become impaired.

COVID-19 continues to evolve and have continuing effects both locally and globally. The extent to which COVID-19, and any variants, may impact our business, including our supply chain, clinical trials and our commercialization efforts for SB206, if approved, will depend on future developments, which are highly uncertain and cannot be predicted with confidence, such as the ultimate geographic spread of the pandemic, the duration of the pandemic, travel restrictions and social distancing in the United States and other countries, business closures or business disruptions and the effectiveness of actions taken in the United States and other countries to contain and treat the pandemic.

Changes to our leadership team or operational resources could prove disruptive to our operations and have adverse consequences for our business and operating results.

From time to time, we undergo changes and transitions among the ranks of senior executives and other senior-level managers, including during 2020 and 2021, when we announced several changes to our executive leadership team. Managing transitions with senior executives or other senior-level managers may divert our existing management team's attention from our core operations, and the recent transitions we have experienced may make it more difficult for us to retain existing employees. In addition, the recent transitions we have experienced have increased our dependency on key members of the senior executive team and other senior-level managers within the organization. We have incurred costs related to transitions in our management team, including severance payments, and have required departing executives to agree to certain obligations in their separation

agreements. We also expect to incur recruitment costs related to the hiring of new executives or engaging other operational resources from time to time.

Moreover, recruiting and retaining qualified personnel is critical to our success. We may not be able to attract and retain these personnel on acceptable terms given our current financial position, recent actions taken to align our resources with our operating strategy, and the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us.

We rely on third parties to supply raw materials necessary to manufacture our API and drug products. If these third parties do not successfully carry out their contractual duties or meet expected deadlines for raw materials, we may be unable to manufacture API or drug product which could jeopardize the start of preclinical studies or clinical trials and potentially delay or cause failure to obtain regulatory approval for or commercialize any of our product candidates.

We rely on third-party suppliers for the raw materials necessary to produce the API and drug products we require. There are a limited number of suppliers for raw materials, including nitric oxide, that are used in the manufacture of our product candidates, drugs (once approved by the FDA or comparable regulatory authority) or the drug products we supply to others, and there may be a need to assess alternate suppliers to prevent a possible disruption of the manufacture of the materials, importantly nitric oxide, necessary to produce our product candidates for our clinical trials, and if approved, ultimately for commercial sale, or to satisfy our obligations to others. We have not entered into long-term agreements with our current suppliers or with any alternate suppliers. We currently obtain our raw material supplies for finished drug products through individual purchase orders. With future third-party manufacturers of our product candidates, we may not have any control over the process or timing of the acquisition of these raw materials. Although we generally do not begin a clinical trial unless we believe we have a sufficient supply of a product candidate to complete the clinical trial, any significant delay in the supply of the raw material components to manufacture drug products for an ongoing clinical trial due to the need to replace a raw material supplier could considerably delay completion of our clinical trials, product testing and potential regulatory approval of our product candidates. If we or our future third-party manufacturers are unable to purchase these raw materials, including nitric oxide, after regulatory approval has been obtained for our product candidates, the commercial launch of our product candidates would be delayed or there would be a shortage in supply, which would impair our ability to generate revenues from the sale of our product candidates. We currently do not have any agreements for the commercial production of these raw materials, including nitric oxide.

Unexpected results in the analysis of raw materials, the API or drug product or problems with the execution of or quality systems supporting the analytical testing work, whether conducted internally or by third-party service providers, could adversely affect our development and commercialization timelines and result in increased costs of our development programs.

We currently rely on third parties to test most of the raw materials necessary to produce our API and drug products, as well as testing of the finished API and drug products at the time of manufacture and over time for stability purposes. In the future, third parties engaged directly by us or by our API and drug product contract manufacturing organizations, or CMOs, may test all such raw materials and finished API and drug products. It is a regulatory requirement that raw materials are tested and there are a limited number of suppliers for testing these raw materials. There may be a need to assess alternate suppliers to prevent a possible disruption of the supply of these raw materials for the manufacture of API or drug product. Additionally, the analytical equipment used by these third-parties must be maintained and operational. Except for the terms established within our, or our CMOs', contracts with the third parties responsible for testing raw materials and finished API and drug products, we have limited ability to control the process or timing of their testing work. Additionally, if the results do not meet specifications, then obtaining additional raw materials may jeopardize our or the CMOs' ability to manufacture API and/or drug product, the start or overall conduct of preclinical studies and clinical trials, the timing of regulatory submissions, or the commercialization of our product candidates, if approved. We currently engage third parties to perform most analytical tests, and in the future our CMOs will perform tests, to ensure the API and drug product meets quality specifications. The analytical equipment used by us or our CMOs to perform these tests must be maintained, qualified, calibrated and operational. If there are testing execution delays, equipment problems or if the results of the analytical testing do not meet our quality specifications, then manufacturing additional API or drug product may increase costs and may jeopardize our or the CMOs' ability to manufacture API and/or drug product, which may cause delays in the start or overall conduct of preclinical studies and clinical trials, the submission of regulatory filings, or the commercialization of our product candidates, if approved.

Our business involves the use of hazardous materials and we and our third-party suppliers and manufacturers must comply with environmental laws and regulations, which can be expensive and restrict how we do business.

Our manufacturing activities, and the manufacturing activities of our third-party suppliers and manufacturers, involve the controlled storage, use and disposal of hazardous materials, including the components of our product candidates such as nitric oxide and other hazardous compounds. Further, our manufactured drug substance and drug products may be considered hazardous materials under applicable laws and regulations. Our manufacturing activities, whether conducted by us or our third party suppliers and manufacturers, like all manufacturing processes that utilize hazardous materials, including those under high pressures, must be properly controlled to avoid unintended reactions or other accidents that could cause injury or damage to personnel, equipment or property. We and our manufacturers and suppliers are subject to laws and regulations governing the use, manufacture, storage, transportation, handling and disposal of these hazardous materials, and our failure to manage the use, manufacture, storage, transportation, handling or disposal of hazardous materials could subject us to significant costs or future liabilities. In some cases, these hazardous materials and various wastes resulting from their use are transported and stored at our suppliers' or manufacturers' facilities pending use and disposal. We and our suppliers and manufacturers cannot completely eliminate the risk of contamination, which could cause an interruption of our commercialization efforts, research and development efforts and business operations, injury to our service providers and others and environmental damage resulting in costly clean-up and liabilities under applicable laws and regulations governing the use, storage, handling and disposal of these materials and specified waste products. Although we believe that the manufacturing controls and safety procedures utilized by us and our third-party suppliers and manufacturers for handling, transporting and disposing of these materials generally comply with the standards prescribed by these laws and regulations, we cannot guarantee that this is the case or eliminate the risk (i) that the laws and regulations will not restrict our or our third-party suppliers' or manufacturers' ability to use, manufacture, store, transport, handle or dispose of such materials or (ii) of accidental contamination or injury from these hazardous materials and processes. If these risks were to materialize, we could experience an interruption of our business operations and we may be held liable for any resulting damages and such liability could exceed our financial resources.

Our employees, independent contractors, principal investigators, CMOs, CROs, consultants, commercial partners and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements, which could expose us to liability and hurt our reputation.

We are exposed to the risk that our employees, independent contractors, principal investigators, CMOs, CROs, consultants, commercial partners and vendors may engage in fraudulent conduct or other illegal activity. Misconduct by these parties could include intentional, reckless or negligent conduct or disclosure of unauthorized activities to us that violates: (i) FDA laws and regulations, including those laws that require the reporting of true, complete and accurate information to the FDA, (ii) manufacturing standards, (iii) federal, state and foreign data privacy, security, fraud and abuse and other healthcare laws, or (iv) laws that require the true, complete and accurate reporting of financial information or data. Activities subject to these laws also involve the improper use or misrepresentation of information obtained in the course of clinical trials, creating fraudulent data in our preclinical studies or clinical trials or illegal misappropriation of drug product, which could result in regulatory sanctions and cause serious harm to our reputation. It is not always possible to identify and deter misconduct by employees and other third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. Additionally, we are subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and financial results, including, without limitation, the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, reputational harm, diminished profits and future earnings, and curtailment of our operations.

Risks Related to Government Regulation

Even if we receive regulatory approval of our product candidates, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense, and we may be subject to penalties, if we fail to comply with regulatory requirements or experience unanticipated problems with our product candidates.

Any regulatory approvals that we receive for our product candidates may be subject to limitations on the approved indicated uses for which the product may be marketed or the conditions of approval or contain requirements for potentially costly post-market testing and surveillance to monitor the safety and efficacy of the product candidate. The FDA may also require a REMS as a condition of approval of our product candidates, which could include requirements for a medication guide, physician communication plans or additional elements to ensure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. In addition, if the FDA or a comparable foreign regulatory authority approves our product candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion, import, export and recordkeeping for our product candidates will be subject to extensive and ongoing regulatory

requirements. These requirements include submissions of safety and other post-marketing information and reports, registration, and continued compliance with cGMP and GCP requirements for any clinical trials that we conduct post-approval. Later discovery of previously unknown problems with our product candidates, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing or manufacturing of our product candidates, withdrawal of the product from the market, or voluntary or mandatory product recalls;
- fines, warning letters or holds on clinical trials;
- refusal by the FDA to approve pending applications or supplements to approved applications filed by us or suspension or revocation of approvals;
- product seizure or detention, or refusal to permit the import or export of our product candidates; and
- injunctions or the imposition of civil or criminal penalties.

The FDA's and other regulatory authorities' policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates.

We also cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may be subject to enforcement action and we may not achieve or sustain profitability.

If we obtain regulatory approval for our product candidates in the United States, any such approval will be limited to the specific indication authorized by the FDA. If we are found to be in violation of FDA and other regulations restricting the promotion of any approved products for unapproved uses, we could be subject to criminal penalties, substantial fines or other sanctions and damage awards.

If our clinical trials are successful, we intend to seek approval for our product candidates for various indications for use. If we obtain regulatory approval to market any of our product candidates with an indication statement for the treatment of one or more of these indications, we will likely be prohibited from marketing any approved products for uses outside of those for which we have received approval.

The regulations relating to the promotion of products for unapproved uses are complex and subject to substantial interpretation by the FDA and other government agencies. Products may not be promoted for uses that are not approved in the labeling by the FDA or EMA. Physicians may, following FDA approval, nevertheless prescribe our products off-label to their patients in a manner that is inconsistent with the approved label. We intend to implement compliance and training programs designed to ensure that our sales and marketing practices comply with applicable regulations. Notwithstanding these programs, the FDA or other government agencies may allege or find that our practices constitute prohibited promotion of our products for unapproved uses. We also cannot be sure that our employees will comply with company policies and applicable regulations regarding the promotion of products for unapproved uses, but we may nevertheless be deemed responsible for their marketing activities.

In recent years, a significant number of pharmaceutical and biotechnology companies have been the target of inquiries and investigations by various federal and state regulatory, investigative, prosecutorial and administrative entities in connection with the promotion of products for unapproved uses and other sales practices, including the Department of Justice and various United States Attorneys' Offices, the Office of Inspector General of the Department of Health and Human Services, the FDA, the Federal Trade Commission and various state Attorneys General offices. These investigations have alleged violations of various federal and state laws and regulations, including claims asserting antitrust violations, violations of the Federal Food, Drug and Cosmetic Act, the False Claims Act, the Prescription Drug Marketing Act, anti-kickback laws and other alleged violations in connection with the promotion of products for unapproved uses, pricing and Medicare and/or Medicaid reimbursement. Many of these investigations originate as "*qui tam*" actions under the False Claims Act. Under the False Claims Act, any individual can bring a claim on behalf of the government alleging that a person or entity has presented a false claim, or caused a false claim to be submitted, to the government for payment. The person bringing a *qui tam* suit is entitled to a share of any recovery or settlement. *Qui tam* suits, also commonly referred to as "whistleblower suits," are often brought by current or former employees. In a *qui tam* suit, the government must decide whether to intervene and prosecute the case. If it declines, the individual may pursue the case alone.

If the FDA or any other governmental agency initiates an enforcement action against us or if we are the subject of a *qui tam* suit and it is determined that we violated prohibitions relating to the promotion of products for unapproved uses, we could be

subject to warning letters, untitled letters, substantial civil or criminal fines or damage awards and other sanctions such as consent decrees and corporate integrity agreements pursuant to which our activities would be subject to ongoing scrutiny and monitoring to ensure compliance with applicable laws and regulations. Any such fines, awards or other sanctions would have an adverse effect on our revenue, business, financial prospects and reputation.

Recently enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and affect the prices we may obtain.

In the United States and some foreign jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any product candidates for which we obtain marketing approval. In 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively the ACA, was signed into law. Since its enactment, however, there have been significant ongoing efforts to modify or eliminate the ACA. On June 17, 2021, the U.S. Supreme Court dismissed the most recent judicial challenge to the ACA without specifically ruling on the constitutionality of the ACA. Prior to the Supreme Court's decision, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through August 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructed certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA.

We expect that the ACA, as well as other healthcare reform measures that have been adopted and may be adopted in the future, may, among other things, result in additional reductions in Medicare and other healthcare funding, more rigorous coverage criteria, new payment methodologies and in additional downward pressure on the price that we receive for any approved product. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability, or commercialize our product candidates, if approved. Adoption of government controls and measures, and tightening of restrictive policies in jurisdictions with existing controls and measures, could limit payments for pharmaceuticals.

Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We cannot be sure whether additional legislative changes will be enacted, or whether the FDA regulations, guidance or interpretations will be changed, or what the impact of such changes on the marketing approvals of our product candidates, if any, may be. In addition, increased scrutiny by the United States Congress of the FDA's approval process may significantly delay or prevent marketing approval, as well as subject us to more stringent product labeling and post-marketing testing and other requirements.

We are subject to governmental economic sanctions and export and import controls that could impair our ability to compete in international markets or subject us to liability if we are not in compliance with applicable laws.

As a United States company, we are subject to United States import and export controls and economic sanctions laws and regulations, and we are required to import and export our product candidates, technology and services in compliance with those laws and regulations, including the United States Export Administration Regulations, the International Traffic in Arms Regulations, and economic embargo and trade sanction programs administered by the Treasury Department's Office of Foreign Assets Control. United States economic sanctions and export control laws and regulations prohibit the shipment of certain products and services to countries, governments and persons targeted by United States sanctions. While we are currently taking precautions to prevent doing any business, directly or indirectly, with countries, governments and persons targeted by United States sanctions and to ensure that our product candidates, if approved, are not exported or used by countries, governments and persons targeted by United States sanctions, such measures may be circumvented. Furthermore, if we export our product candidates, if approved, the exports may require authorizations, including a license, a license exception or other appropriate government authorization. Complying with export control and sanctions regulations for a particular sale may be time-consuming and may result in the delay or loss of sales opportunities. Failure to comply with export control and sanctions regulations for a particular sale may expose us to government investigations and penalties. If we are found to be in violation of United States sanctions or import or export control laws, it could result in civil and criminal, monetary and non-monetary penalties, including possible incarceration for those individuals responsible for the violations, the loss of export or import privileges and reputational harm.

We are subject to anti-corruption and anti-money laundering laws with respect to our operations and non-compliance with such laws can subject us to criminal or civil liability and harm our business.

We are subject to the United States Foreign Corrupt Practices Act of 1977, as amended, or the FCPA, the United States domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act and possibly other anti-bribery and anti-money laundering laws in countries in which we may conduct activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees and third-party intermediaries from authorizing, offering or providing, directly or indirectly, improper payments or benefits to recipients in the public or private sector. As we commercialize our product candidates and eventually commence international sales and business, we may engage with collaborators and third-party intermediaries to sell our products abroad and to obtain necessary permits, licenses and other regulatory approvals. We or our third-party intermediaries may have direct or indirect interactions with officials and employees of government agencies or state-owned or affiliated entities. We may be held liable for the corrupt or other illegal activities of these third-party intermediaries, our employees, representatives, contractors, partners and agents, even if we do not explicitly authorize such activities.

Noncompliance with anti-corruption and anti-money laundering laws could subject us to whistleblower complaints, investigations, sanctions, settlements, prosecution, other enforcement actions, disgorgement of profits, significant fines, damages, other civil and criminal penalties or injunctions, suspension or debarment from contracting with certain persons, the loss of export privileges, reputational harm, adverse media coverage and other collateral consequences. Responding to any action will likely result in a materially significant diversion of management's attention and resources and significant defense costs and other professional fees.

Changes in and failures to comply with United States and foreign privacy and data protection laws, regulations and standards may adversely affect our business, operations and financial performance.

We are subject to or affected by numerous federal, state and foreign laws and regulations, as well as regulatory guidance, governing the collection, use, disclosure, retention, and security of personal data, such as information that we collect about patients and healthcare providers in connection with clinical trials in the United States and abroad. The global data protection landscape is rapidly evolving, and implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future. This evolution may create uncertainty in our business, affect our or our collaborators', service providers' and contractors' 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 or our collaborators, service providers and contractors to comply with federal, state or foreign laws or regulation, our internal policies and procedures or our contracts governing processing of personal information could result in negative publicity, diversion of management time and effort and proceedings against us by governmental entities or others. In many jurisdictions, enforcement actions and consequences for noncompliance are rising.

In the United States, HIPAA imposes privacy, security and breach reporting obligations with respect to individually identifiable health information upon "covered entities" (health plans, health care clearinghouses and certain health care providers), and their respective business associates, individuals or entities that create, received, maintain or transmit protected health information in connection with providing a service for or on behalf of a covered entity. HIPAA mandates the reporting of certain breaches of health information to HHS, affected individuals and if the breach is large enough, the media. Entities that are found to be in violation of HIPAA as the result of a breach of unsecured protected health information, or PHI, a complaint about privacy practices or an audit by the Department of Health and Human Services, or HHS, may be subject to significant civil, criminal and administrative fines and penalties and/or additional reporting and oversight obligations if required to enter into a resolution agreement and corrective action plan with HHS to settle allegations of HIPAA non-compliance. Even when HIPAA does not apply, according to the Federal Trade Commission or the FTC, failing to take appropriate steps to keep consumers' personal information secure constitutes unfair acts or practices in or affecting commerce in violation of Section 5(a) of the Federal Trade Commission Act. 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.

In addition, certain state laws govern the privacy and security of health-related and other personal information in certain circumstances, some of which are more stringent, broader in scope or offer greater individual rights with respect to PHI than HIPAA and many of which may 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, can result in the imposition of significant civil and/or criminal penalties and private litigation. For example, California enacted the California Consumer Privacy Act, or the CCPA, on June 28, 2018, which took effect on January 1, 2020. The CCPA gives California residents expanded rights to access and delete their personal information, opt out of certain personal information sharing, and receive detailed information about how their personal information is used. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation. Additionally, the California Privacy Rights Act, or the CPRA,

recently passed in California. The CPRA will impose additional data protection obligations on companies doing business in California, including additional consumer rights processes, limitations on data uses, new audit requirements for higher risk data and opt outs for certain uses of sensitive data. It will also create a new California data protection agency authorized to issue substantive regulations and could result in increased privacy and information security enforcement. The majority of the provisions will go into effect on January 1, 2023. Similar laws have passed in Virginia and Colorado, and have been proposed in other states and at the federal level, reflecting a trend toward more stringent privacy legislation in the United States. The enactment of such laws could have potentially conflicting requirements that would make compliance challenging. In the event that we are subject to or affected by HIPAA, the CCPA, the CPRA or other domestic privacy and data protection laws, any liability from failure to comply with the requirements of these laws could adversely affect our financial condition.

Our operations abroad may also be subject to increased scrutiny or attention from data protection authorities. Many countries in these regions have established or are in the process of establishing privacy and data security legal frameworks with which we, our collaborators, service providers, including our CROs, and contractors must comply. For example, the EU has adopted the EU GDPR, which went into effect in May 2018 and imposes strict requirements for processing the personal data of individuals within the EEA, including clinical trial data. The GDPR has and will continue to increase compliance burdens on us, including by mandating potentially burdensome documentation requirements and granting certain rights to individuals to control how we collect, use, disclose, retain and process personal data about them. Member states of the EEA may impose further obligations relating to the processing of genetic, biometric or health data, which could further add to our compliance costs and limit how we process this information. Further, the GDPR increases the scrutiny of transfers of personal data from clinical trial sites located in the EEA to the United States and other jurisdictions that the European Commission does not recognize as having "adequate" data protection laws; in July 2020, the CJEU, limited how organizations could lawfully transfer personal data from the EEA to the United States by invalidating the EU-US Privacy Shield and imposing further restrictions on use of the standard contractual clauses, which could increase our costs and our ability to efficiently process personal data from the EEA. In addition, the GDPR provides for robust regulatory enforcement and fines of up to €20 million or 4% of the annual global revenue of the noncompliant company, whichever is greater. Further, from January 1, 2021, we have had to comply with the GDPR and the GDPR as incorporated into UK national law, the latter regime having the ability to separately fine up to the greater of £17.5 million or 4% of global turnover. The relationship between the UK and the EU in relation to certain aspects of data protection law remains unclear, and it is unclear how UK data protection laws and regulations will develop in the medium to longer term. The European Commission has adopted an adequacy decision in favor of the UK, enabling data transfers from EU member states to the UK without additional safeguards. However, the UK adequacy decision will automatically expire in June 2025 unless the European Commission re-assesses and renews or extends that decision.

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, 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. As we expand into other foreign countries and jurisdictions, we may be subject to additional laws and regulations that may affect how we conduct business.

Risks Related to Our Intellectual Property

If we fail to comply with our obligations under any license, collaboration or other agreements, it could have a material adverse effect on our, or our potential future commercial partners', commercialization efforts for our product candidates.

Our current licenses impose, and any future licenses we enter into may impose, various development, commercialization, milestone, royalty, diligence, sublicensing, insurance, patent prosecution and enforcement, and other obligations on us. If we breach any of these obligations, or use the intellectual property licensed to us in an unauthorized manner, we may be required to pay damages and the licensor may have the right to terminate the license, which could result in us being unable to develop, manufacture and sell products that are covered by the licensed technology or enable a competitor to gain access to the licensed technology.

If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.

In addition to seeking patents for our product candidates, we also rely on trade secrets, including unpatented know-how, technology and other proprietary information, to maintain our competitive position.

We seek to protect our trade secrets, in part, by entering into non-disclosure and confidentiality agreements with parties who have access to them, such as our employees (including through specific provisions in employment contracts), corporate

collaborators, outside scientific collaborators, contract manufacturers, consultants, advisors and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants. Despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, our competitive position would be materially impaired.

Our reliance on third parties requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed.

Because we expect to rely on third parties to manufacture any of our current or future product candidates, we must, at times, share trade secrets with them. These agreements typically limit the rights of the third parties to use or disclose our confidential information, including our trade secrets. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others, or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may adversely impact our business.

Intellectual property rights do not necessarily address all potential threats to our competitive advantage.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations, and may not adequately protect our business, or permit us to maintain our competitive advantage, for reasons including but not limited to the following:

- others may be able to make formulations or compositions that are the same as or similar to certain of our product candidates but that are not covered by the claims of the patents that we own or license;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our trade secret or similar rights;
- issued patents that we own or license may not provide us with any competitive advantages, or may be held invalid or unenforceable as a result of legal challenges;
- our competitors might conduct research and development activities in the United States and other countries that provide a safe harbor from patent infringement claims for certain research and development activities, as well as in countries where we do not have patent rights, and then use the information learned from such activities to develop competitive products for sale in our major commercial markets; and
- we may not develop additional proprietary technologies that are patentable.

Risks Related to Our Common Stock

The market price and trading volume of our common stock has fluctuated substantially and may fluctuate widely in the future and the value of an investment in our common stock may decline.

Our stock price has experienced extreme volatility and could vary significantly as a result of many factors. Between January 1, 2021 and February 4, 2022, the last reported sales price of our common stock fluctuated between a high of $25.50 and a low of $2.95. The market price and trading volume of our common stock may continue to fluctuate from time to time as a result of factors outside of our control. For example, the trading price of our common shares increased significantly in June 2021, which we believe was attributable to general market conditions and recognition of our recently announced top-line results of our B-SIMPLE4 study of SB206 as a potential treatment for molluscum contagiosum, and has since declined. There is a potential for rapid and substantial decreases in the price of our common stock, including decreases unrelated to our operating performance or prospects, which could result in substantial losses for our existing stockholders.

In addition, the stock market in general and smaller reporting companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. These broad market and industry fluctuations may negatively impact the price or liquidity of our common stock, regardless of our operating performance. Any actual or perceived negative operational developments or market or industry fluctuations may compound each other's negative impacts on the price of liquidity of our common stock.

If we fail to meet the requirements for continued listing on the Nasdaq Capital Market, our common stock could be delisted from trading, which would decrease the liquidity of our common stock and impact our ability to raise additional capital.

Although our common stock is currently listed on the Nasdaq Capital Market, an active trading market for our shares may not be sustained. We are required to meet specified requirements to maintain our listing on the Nasdaq Capital Market. If our common stock is delisted and there is no longer an active trading market for our shares, it may, among other things:

- cause you difficulty in selling your shares without depressing the market price for the shares or sell your shares at all;
- substantially impair our ability to raise additional funds;
- result in a loss of institutional investor interest and fewer financing opportunities for us; and/or
- result in potential breaches of representations or covenants of agreements pursuant to which we made representations or covenants relating to our compliance with applicable listing requirements. Claims related to any such breaches, with or without merit, could result in costly litigation, significant liabilities and diversion of our management's time and attention and could have a material adverse effect on our financial condition, business and results of operations.

A delisting would also reduce the value of our equity compensation plans, which could negatively impact our ability to retain key employees.

We, and certain of our directors and current and former officers, have in the past been named as parties to putative stockholder class action lawsuits and may be subject to litigation or other claims again in the future, and such litigation or other claims could adversely affect us, require significant management time and attention, result in significant legal expenses or damages, and cause our business and financial condition, results of operations to suffer.

Putative stockholder class action lawsuits were filed against us and certain of our current and former directors and officers in 2017. The court dismissed those putative stockholder class actions with prejudice, and we have concluded that these matters are closed. We currently have no other pending litigation against us, but we may face additional claims in the future. If we face similar litigation or other claims again in the future, it could result in substantial costs and a diversion of management's attention and resources and their ultimate outcomes could have a material adverse effect on our business, financial condition and results of operations. While we expect insurance to cover certain costs associated with defending such litigation, insurance coverage may be insufficient and could require a diversion of our resources. There also may be adverse publicity associated with litigation or claims made against us and/or our directors and officers that could negatively affect perception of our business, regardless of whether the allegations are valid or whether we are ultimately found liable.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws under Delaware law could make an acquisition of our company, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our amended and restated certificate of incorporation and our amended and restated bylaws may discourage, delay or prevent a merger, acquisition or other change in control of our company that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, because our board of directors is responsible for appointing the members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Among other things, these provisions include those establishing (i) a classified board of directors with three-year staggered terms, which may delay the ability of stockholders to change the membership of a majority of our board of directors, (ii) no cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates and (iii) other provisions.

Our restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and 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 and/or our directors, officers, or employees or agents.

Our restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of us; (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees or agents to us and/or our stockholders; (iii) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law or our amended and restated certificate of incorporation or amended and restated bylaws; or (iv) any action asserting a claim against us governed by the internal affairs doctrine. These choice of forum provisions do not preclude or contract the scope of exclusive federal or concurrent jurisdiction for any actions brought under the Securities Act of 1933, as amended, or the Securities Act, or the Exchange Act. Accordingly, our choice of forum provisions will not relieve us of our duties to comply with the federal securities laws and the rules and regulations thereunder, and our stockholders will not be deemed to have waived our compliance with these laws, rules and regulations. Any person or entity purchasing or otherwise acquiring any interest in any of our securities shall be deemed to have notice of and consented to these provisions. These choice of forum provisions may limit a stockholder's ability to bring a claim in a judicial forum of its choosing for disputes with us and/or our directors, officers or other employees or agents, which may discourage lawsuits against us and our directors, officers and other employees or agents.

If a court were to find the choice of forum provision contained in our restated certificate of incorporation 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, results of operations, and financial condition. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management and other employees.

Our ability to use net operating losses to offset future taxable income may be subject to certain limitations.

As of December 31, 2021, we had federal and state net operating loss carryforwards, or NOLs, of $100.0 million and $62.9 million, respectively. The NOLs begin to expire in 2028 and 2023 for federal and state tax purposes, respectively. As of December 31, 2021, we had government research and development tax credits of approximately $1.7 million to offset future federal taxes which begin to expire in 2040.

During the course of preparing our consolidated financial statements as of and for the year ended December 31, 2021, we completed an assessment of the available NOL and tax credit carryforwards under Sections 382 and 383, respectively, of the Internal Revenue Code, or the Code. If an ownership change, as defined in Section 382, occurs, it results in a Section 382 limitation that applies to all NOLs and tax credits generated prior to the ownership change date that can be used to offset taxable income incurred after the ownership change date. The annual limitation is based on a company's stock value prior to the ownership change, multiplied by the applicable federal long-term, tax-exempt interest rate.

We determined that we underwent multiple ownership changes throughout our history as defined under Section 382, including most recently in 2015 and 2020. As a result of the identified ownership changes, the portion of NOL and tax credit carryforwards attributable to the pre-ownership change periods are subject to a substantial annual limitation under Sections 382 and 383. We have adjusted our NOL and tax credit carryforwards to address the impact of the Section 382 ownership changes. This resulted in a reduction of available federal and state NOLs of $113.8 million and $149.4 million, respectively. The write down of the NOLs reduced the tax loss carryforward line as previously disclosed by $26.8 million, with a corresponding decrease in the valuation allowance. We also reduced our tax credit carryforwards within gross deferred tax assets by $9.7 million with a corresponding decrease in the valuation allowance, comprised of $8.1 million related to Section 383 limitations on prior credits and $1.6 million related to amounts that would not have been recorded during the year ended December 31, 2020 given the 383 limitation.

Since the limitation affected the prior period, we have adjusted our 2020 tax footnote presentation with respect to the gross NOL deferred tax asset, the tax credit carryforwards and the corresponding valuation allowance. However, there was no net impact to the net deferred tax asset and tax expense as the decreases in the NOLs and tax credit carryforwards were offset completely by a corresponding adjustment to our overall valuation allowance.

In addition, future changes in our stock ownership, as well as other changes that may be outside of our control, could result in additional ownership changes under Section 382. As a result, even if we achieve profitability, we may not be able to use a material portion of our NOLs or tax credit carryforwards. We have recorded a full valuation allowance related to our NOLs and tax credits due to the uncertainty of the ultimate realization of the future benefits of those assets.

If securities or industry analysts do not publish research or reports about our business, or if they issue an adverse or misleading opinion regarding our stock, our stock price and trading volume could decline.

The trading market for our common stock is influenced by the research and reports that industry or securities analysts publish about us and/or our business. If any of the analysts who cover us issue an adverse or misleading opinion regarding us, our business model, our intellectual property or our stock performance, or if our regulatory clearance timelines, clinical trial results or operating results fail to meet the expectations of analysts, our stock price would likely decline. If one or more of these analysts ceases coverage of us or fail to publish reports on us regularly, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

Because we do not anticipate paying any cash dividends on our capital stock in the foreseeable future, we expect capital appreciation, if any, will be our stockholders' sole source of gain.

We have never declared or paid cash dividends on our capital stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. Additionally, any future debt agreements may preclude us from paying dividends. As a result, we expect capital appreciation, if any, of our common stock is expected to be our stockholders' sole source of gain for the foreseeable future.

General Risk Factors

We may be subject to confidential information theft or misuse, which could harm our business and results of operations. Our internal computer systems, or those of any of our existing or potential future collaborators, CROs or other contractors or consultants, may fail or suffer security breaches, which could result in a material disruption of our product development programs, expose the Company to liability, affect our reputation and otherwise harm our business.

We face attempts by others to gain unauthorized access to our information technology systems on which we maintain proprietary and other confidential information. Despite the implementation of security measures, our internal computer systems and those of our current and any future CROs, CMOs, and other contractors, consultants and collaborators are vulnerable to damage from cyberattacks, "phishing" attacks, computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. Attacks upon information technology systems are increasing in their frequency, levels of persistence, sophistication and intensity, and are being conducted by sophisticated and organized groups and individuals with a wide range of motives and expertise. The risk of a security breach or disruption, particularly through cyberattacks or cyber intrusion, including by computer hackers, foreign governments and cyber terrorists, has generally increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased. As a result of the COVID-19 pandemic, we may also face increased cybersecurity risks due to our increased reliance on internet technology and the number of our employees who are working remotely, which may create additional opportunities for cybercriminals to exploit vulnerabilities. Furthermore, because the techniques used to obtain unauthorized access to, or to sabotage, systems change frequently and often are not recognized until launched against a target, we may be unable to anticipate these techniques or implement adequate preventative measures. We may also experience security breaches that may remain undetected for an extended period. If such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our business operations, whether due to a loss of our trade secrets or other similar disruptions. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. In addition, such a breach may require notification to governmental agencies, the media or individuals pursuant to applicable data privacy and security law and regulations. We would also be exposed to a risk of loss, including financial assets or litigation and potential liability, which could materially adversely affect our business, financial condition, results of operations and prospects. We also rely on third parties to manufacture our product candidates, and similar events relating to their computer systems could also have a material adverse effect on our business. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could be subject to material legal claims and incur liability or other negative consequences, including increased cybersecurity protection costs, damage to our reputation, disruption of our internal operations and delays in the further development of and potential commercialization of our product candidates.

We may be adversely affected by natural disasters, pandemics and other catastrophic events, and by man-made problems such as terrorism, that could disrupt our business operations and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Our corporate headquarters is located in Durham, North Carolina, near major hurricane and tornado zones. If a disaster, power outage or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure, such as enterprise financial systems, manufacturing resource planning or enterprise quality systems, 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. Our manufacturers' and suppliers' facilities are located in multiple locations, where other natural disasters, pandemics or similar events, such as blizzards, tornadoes, fires, explosions or large-scale accidents or power outages, could severely disrupt their operations. In addition, acts of terrorism, pandemic illness and other geo-political unrest could cause disruptions in our business or the businesses of our collaborators, manufacturers or the economy as a whole. All of the aforementioned risks may be further increased if we do not implement a disaster recovery plan or our collaborators' or manufacturers' disaster recovery plans prove to be inadequate. Any of the above could result in delays in the regulatory approval, manufacture, distribution or commercialization of our product candidates.

If we are unable to obtain and maintain patent protection for our product candidates, or if the scope of the patent protection obtained is not sufficiently broad, our competitors could develop and commercialize technology and products similar or identical to ours, and our ability to successfully commercialize our technology and product candidates may be impaired.

We rely upon a combination of patents, trade secret protection, and confidentiality agreements to protect the intellectual property related to our product candidates. Our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to our product candidates. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our product candidates.

The patent prosecution process is expensive and time-consuming, however, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our technology platform or product candidates before it is too late to obtain patent protection. We may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the rights to patents licensed to or from third parties. In particular, certain patents and patent applications covering our core technology platform are exclusively licensed from the University of North Carolina, or UNC, and under our license agreement with UNC, we rely on UNC to prosecute and maintain such patents and applications. Therefore, these patents and applications, and any other patents and applications that we may license from or to third parties, may not be prosecuted and enforced in a manner consistent with the best interests of our business.

If the patent applications we hold or have in-licensed with respect to our product candidates fail to issue, if their breadth or strength of protection is threatened, or if they fail to provide meaningful exclusivity for our current or any future product candidates, it could have a materially adverse effect on our business. Even if our owned and licensed patent applications issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. Our competitors may be able to circumvent our owned and licensed patents by developing similar or alternative technologies or products in a non-infringing manner.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has in recent years been the subject of much litigation. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States or vice versa. For example, European patent law restricts the patentability of methods of treatment of the human body more than United States law does. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot know with certainty whether we were the first to make the inventions claimed in our owned and licensed patents or pending patent applications, or that we were the first to file for patent protection of such inventions. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Our pending and future patent applications may not result in patents being issued that protect our technology or products, in whole or in part, or which effectively prevent others from commercializing competitive technologies and products. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our owned and licensed patents or narrow the scope of our patent protection while patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

Changes to patent laws in the United States or other countries could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. For example, changes to the United States patent system have come into force under the Leahy-Smith America Invents Act, or the Leahy-Smith Act, which was signed into law in September 2011. The Leahy-Smith Act included a number of significant changes to United States patent law. Under the Leahy-Smith Act, the United States transitioned in March 2013 to a "first to file" system in which the first inventor to file a patent application will be entitled to the patent. Third parties are allowed to submit prior art before the issuance of a patent by the USPTO, and may become involved in opposition, derivation, reexamination, *inter partes* review or interference proceedings challenging our patent rights or the patent rights of others. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate, our patent rights, which could adversely affect our competitive position. While we cannot predict with certainty the impact the Leahy-Smith Act or any potential future changes to the United

States or foreign patent systems will have on the operation of our business, the Leahy-Smith Act and such future changes could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business, results of operations, financial condition and prospects. Additionally, the first to file system under the Leahy-Smith Act may incentivize companies like us in the biopharmaceutical industry to file patent applications as soon as possible, and filing applications as soon as possible runs the risk that the application will not have the supporting data to claim the broadest protection possible in the United States.

Moreover, we may be subject to a third-party preissuance submission of prior art to the USPTO or become involved in opposition, derivation, reexamination, *inter partes* review, post-grant review or interference proceedings challenging our patent rights or the patent rights of others. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology or products and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights. In addition, if the breadth or strength of protection provided by our owned and licensed patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates.

In addition, the issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in loss of exclusivity or freedom to operate or in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

Finally, certain of our activities and our licensors' activities have been funded, and may in the future be funded, by the United States federal government. When new technologies are developed with United States federal government funding, the government obtains certain rights in any resulting patents, including a nonexclusive license authorizing the government to use the invention for non-commercial purposes. These rights may permit the government to disclose our confidential information to third parties and to exercise "march-in" rights to use or allow third parties to use our patented technology. The government can exercise its march-in rights if it determines that action is necessary because we fail to achieve practical application of the United States government-funded technology, because action is necessary to alleviate health or safety needs, to meet requirements of federal regulations or to give preference to United States industry. In addition, United States government-funded inventions must be reported to the government, United States government funding must be disclosed in any resulting patent applications, and our rights in such inventions may be subject to certain requirements to manufacture products in the United States.

We may be involved in lawsuits to protect or enforce our owned and licensed patents, which could be expensive, time-consuming and unsuccessful. Further, our issued patents could be found invalid or unenforceable if challenged in court.

If we were to initiate legal proceedings against a third-party to enforce a patent directed to our product candidates, or one of our future product candidates, the defendant could counterclaim that our patent is invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, non-enablement or insufficient written description. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO or made a misleading statement during prosecution. Third parties may also raise similar claims before the USPTO, even outside the context of litigation. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art of which we and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our product candidates. Such a loss of patent protection would harm our business.

Interference proceedings provoked by third parties or brought by us or declared by the USPTO may be necessary to determine the priority of inventions with respect to our owned and licensed patents or patent applications. An unfavorable outcome could require us to cease using the related technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms, or at all.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation.

Most of our competitors are larger than we are and have substantially greater resources than we do. They are, therefore, likely to be able to sustain the costs of complex patent or other intellectual property rights litigation longer than we could. Accordingly, despite our efforts, we may not be able to prevent third parties from infringing upon or misappropriating our intellectual property. Litigation could result in substantial costs and diversion of management resources, which could harm our business. In addition, the uncertainties associated with litigation could compromise our ability to raise the funds necessary to continue our clinical trials, continue our internal research programs, or in-license needed technology or other product candidates. There could also be public announcements of the results of the hearing, motions, or other interim proceedings or developments. If securities analysts or investors perceive those results to be negative, it could cause the price of shares of our common stock to decline.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

Periodic maintenance fees on any issued patent are due to be paid to the USPTO and other foreign patent agencies in several stages over the lifetime of the patent. The USPTO and various foreign national or international patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. While an inadvertent lapse can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Non-compliance events that could result in abandonment or lapse of patent rights include, but are not limited to, failure to timely file national and regional stage patent applications based on our international patent application, failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents. If we or our licensors fail to maintain the patents and patent applications covering our technology platform or product candidates, our competitors might be able to enter the market, which would have an adverse effect on our business.

Changes in United States patent laws could diminish the value of patents in general, thereby impairing our ability to protect our products.

The United States has recently enacted and implemented wide-ranging patent reform legislation. The United States Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances, modifying some legal standards applied by the USPTO in examination of patent applications or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on actions by the United States Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents, increase the likelihood of challenges to patents we obtain or license or weaken our ability to enforce patents that we have licensed or that we might obtain in the future.

We may not be able to protect our intellectual property rights throughout the world, which could impair our business.

Filing, prosecuting and defending patents on our product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our invention in such countries. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and may export otherwise infringing products to territories where we have patent protection, but enforcement rights are not as strong as those in the United States. These products may compete with our product candidates and our owned and licensed patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of some countries do not favor the enforcement of patents and other intellectual property protection, which could make it difficult for us to stop the infringement of our owned and licensed patents generally. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our owned and licensed patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful.

Many countries, including EU countries, India, Japan and China, have compulsory licensing laws under which a patent owner may be compelled under specified circumstances to grant licenses to third parties. In those countries, we may have limited remedies if patents are infringed or if we are compelled to grant a license to a third party, which could materially diminish the value of those patents. This could limit our potential revenue opportunities. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

We may not be able to obtain licenses to third-party intellectual property. Third parties may initiate legal proceedings alleging infringement of their intellectual property rights.

A third party may hold intellectual property, including patent rights that are important or necessary to the development or commercialization of our product candidates. However, we may not be able to obtain such licenses on commercially reasonable terms, or at all. In addition, our existing licenses may be terminated or may not be renewed, which could hurt our business.

In addition, our commercial success depends upon our ability to develop, manufacture, market and sell our product candidates and use our proprietary technologies without infringing the proprietary rights of third parties. There is considerable intellectual property litigation in the biotechnology and pharmaceutical industries. We may become party to, or threatened with, future adversarial proceedings or litigation regarding intellectual property rights with respect to our products and technology, including interference or derivation proceedings before the USPTO. Numerous United States and foreign issued patents and pending patent applications owned by third parties exist in the fields in which we are developing our product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, and as we gain greater visibility and market exposure as a public company, the risk increases that our product candidates or other business activities may be subject to claims of infringement of the patent and other proprietary rights of third parties. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future. We have conducted searches for information in support of patent protection and otherwise evaluating the patent landscape for nitric oxide releasing materials and products, and, based on these searches and evaluations to date, we do not believe that there are valid patents which contain granted claims that could be asserted with respect to our nitric oxide-based product candidates.

Parties making claims against us may obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize one or more of our product candidates or force us to cease some of our business operations. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. If we are found to infringe a third party's intellectual property rights, we could be required to redesign our infringing products or obtain a license from such third party to continue developing and marketing our products and technology. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. Moreover, we could be forced, including by court order, to cease commercializing the infringing technology or product. In addition, we could be found liable for monetary damages, including treble damages and attorneys' fees if we are found to have willfully infringed a patent. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

We may be subject to claims by third parties asserting that we or our employees have misappropriated their intellectual property or claiming ownership of what we regard as our own intellectual property.

Many of our employees were previously employed at other biotechnology or pharmaceutical companies or universities. Although we try to ensure that our employees do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that these employees or we have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such employee's former employer. Litigation may be necessary to defend against these claims. In addition, while it is our policy to require our employees and contractors who may be involved in the development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who in fact develops intellectual property that we regard as our own. Our and their assignment agreements may not be self-executing or may be breached, and we may be forced to bring claims against third parties, or defend claims they may bring against us, to determine the ownership of what we regard as our intellectual property. If we fail in prosecuting or defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in prosecuting or defending against such claims, litigation could result in substantial costs and be a distraction to management.

Any trademarks we have obtained or may obtain may be infringed or successfully challenged, materially harming our business.

We expect to rely on trademarks as one means to distinguish any of our product candidates that are approved for marketing from the products of our competitors. Once we select new trademarks and apply to register them, our trademark applications

may not be approved. Third parties may oppose or attempt to cancel our trademark applications or trademarks, or otherwise challenge our use of the trademarks. In the event that our trademarks are successfully challenged, we could be forced to rebrand our products, which could result in loss of brand recognition and could require us to devote resources to advertising and marketing new brands. Further, our competitors may infringe our trademarks, including with respect to our Nitricil technology and we may not have adequate resources to enforce our trademarks.

Outside of the United States we cannot be certain that any country's patent or trademark office will not implement new rules that could seriously affect how we draft, file, prosecute and maintain patents, trademarks and patent and trademark applications.

We cannot be certain that the patent or trademark offices of countries outside the United States will not implement new rules that increase costs for drafting, filing, prosecuting and maintaining patents, trademarks and patent and trademark applications or that any such new rules will not restrict our ability to file for patent protection. For example, we may elect not to seek patent protection in some jurisdictions or for some product candidates in order to save costs. We may be forced to abandon or return the rights to specific patents due to a lack of financial resources.

Item 1B. Unresolved Staff Comments.

Not applicable.

Item 2. Properties.

We previously operated out of our corporate headquarters in Morrisville, North Carolina, where we leased a 51,350 square foot facility under a lease with an initial term expiring in 2026. As part of our broader strategic plan to shift our operating cost structure characteristics from fixed to variable and to reduce or offset our remaining fixed lease obligation associated with a large-scale manufacturing site, on July 16, 2020, we entered into a lease termination agreement, which provided for the early termination of the previously existing lease, as amended. Pursuant to the terms of the lease termination agreement, our previous lease was terminated in connection with the landlord entering into a new lease with a new tenant for the premises in the building covered by our previous lease, which commenced on July 16, 2020.

In connection with the termination of our previous lease, we entered into a sublease agreement, which was effective upon the termination of our previous lease, through which we subleased from the new tenant approximately 12,000 square feet (which was reduced to approximately 10,000 square feet after August 31, 2020) in the building that was covered by our previous lease. The new tenant and the landlord entered into the new lease as a condition precedent to the effectiveness of the termination of our previous lease, and, in connection with the termination of our previous lease, the landlord consented to our sublease with the new tenant. The sublease expired on March 31, 2021.

The facility underlying our previous lease served as our corporate headquarters and our sole research, development and manufacturing facility. While we operated our corporate headquarters, research and development laboratories and pilot scale cGMP manufacturing activities within portions of the facility pursuant to the sublease into the first quarter of 2021, we decommissioned the areas within the facility, as well as the associated equipment, that supported our large scale cGMP drug manufacturing capability in preparation for execution of the lease termination agreement during 2020.

On January 18, 2021, we entered into a lease with an initial term expiring in 2032, which has subsequently been amended, for 19,265 rentable square feet located in Durham, North Carolina. This site serves as our corporate headquarters and will support various cGMP activities, including research and development and small-scale manufacturing capabilities. These capabilities include the infrastructure necessary to support small-scale drug substance manufacturing and the ability to act as a primary, or secondary backup, component of a potential future commercial supply chain.

We are preparing our new location to support various cGMP activities, including research and development and small-scale manufacturing capabilities, as described in the section entitled "Business—Manufacturing and Supplies" in this Annual Report.

See "Note 8—Commitments and Contingencies" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding facility lease transactions.

Item 3. Legal Proceedings.

We are not currently a party to any material legal proceedings and are not aware of any claims or actions pending against us that we believe could have a material adverse effect on our business, operating results, cash flows or financial statements. In the future, we may from time to time become involved in litigation relating to claims arising from our ordinary course of business.

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 trades on the Nasdaq Capital Market under the symbol "NOVN."

Holders

As of February 4, 2022, there were approximately 109 stockholders of record of our common stock. Holders of record are defined as those stockholders whose shares are registered in their names in our stock records and do not include beneficial owners of common stock whose shares are held in the names of brokers, dealers or clearing agencies.

Dividends

We have never paid cash dividends and do not anticipate paying cash dividends in the foreseeable future.

Recent Sales of Unregistered Securities

None.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

We did not purchase any of our equity securities during the fourth quarter of 2021.

Item 6. Selected Financial Data.

Not applicable.

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

This Management's Discussion and Analysis of Financial Condition and Results of Operations should be read with our consolidated financial statements and notes thereto included elsewhere in this Annual Report. In addition to historical information, the following discussion contains forward-looking statements that involve risks, uncertainties and assumptions. Where possible, we have tried to identify these forward-looking statements by using words such as "believe," "contemplate," "continue," "due," "goal," "objective," "plan," "seek," "target," "expect," "believe," "anticipate," "intend," "may," "will," "would," "could," "should," "potential," "predict," "project," or "estimate," and similar expressions or variations. These statements are based on the beliefs and assumptions of our management based on information currently available to management. Forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Except as may be required by law, we undertake no obligation to update any forward-looking statements to reflect events or circumstances after the date of such statements. These forward-looking statements are subject to numerous risks including, but not limited to, those set forth in the "Risk Factors" in Part I, Item 1A of this Annual Report.

Overview

We are a pre-commercial nitric oxide-based pharmaceutical company focused on dermatology and anti-infective therapies. Our vision is to create the world's leader in nitric oxide-based science, technology, and clinical translation in support of delivering safe and efficacious therapies using our proprietary nitric oxide-based technology platform, Nitricil™, to generate macromolecular NCEs. Our proprietary technology platform leverages nitric oxide's naturally occurring anti-viral, anti-bacterial, anti-fungal, and immunomodulatory mechanisms of action to treat a range of diseases with significant unmet needs. Nitric oxide plays a vital role in the natural immune system response against microbial pathogens and is a critical regulator of inflammation. Our ability to harness nitric oxide and its multiple mechanisms of action has enabled us to create a platform with the potential to generate differentiated product candidates. The two key components of our nitric oxide platform are our proprietary Nitricil technology, which drives the creation of NCEs, and our formulation science, both of which we use to tune our product candidates for specific potential indications. Our ability to deploy nitric oxide in a solid form, on demand and in localized formulations allows us the potential to improve patient outcomes in a variety of diseases.

We have clinical-stage dermatology and anti-infective drug candidates with multi-factorial (SB204), anti-viral (SB206), anti-fungal (SB208), and anti-inflammatory (SB414) mechanisms of action. We have also introduced a possible anti-viral product candidate for the treatment of external genital warts (SB207). We have conducted or are currently conducting preclinical work on NCEs, including berdazimer sodium, and formulations for the potential treatment of (i) SARS-CoV-2, the virus that causes COVID-19 (SB019); (ii) antimicrobial indications for the adjacent companion animal health market (NVN4100); (iii) cervical intraepithelial neoplasia caused by high-risk human papilloma virus in the men's and women's health field (WH504 and WH602); and (iv) inflammatory disorders.

We are currently focusing our efforts and resources on our priority development pipeline candidates, which include (i) progressing our lead program, SB206, as a treatment for molluscum contagiosum, or molluscum, including preparing for and seeking U.S. regulatory approval, and implementing prelaunch strategy and U.S. commercial preparation; (ii) advancing our late-stage product candidate, SB204, for the treatment of acne vulgaris, or acne, within the U.S., as our second lead program toward a registrational Phase 3 study, based on two prior Phase 3 studies; and (iii) progressing our SB019 development program into a Phase 1 study for a potential intranasal prophylaxis or therapeutic for mild-to-moderate COVID-19 infection.

Please see additional details related to our "Priority Development Pipeline" and "Pipeline Expansion Opportunities", as described in the section entitled "Business" in this Annual Report.

Business Updates

During 2021, our primary programmatic focus was on our molluscum product candidate, SB206, and we intend to continue to focus our near term development efforts on this program. Following the positive top-line results from the B-SIMPLE4 trial announced in June 2021 and the comprehensive B-SIMPLE4 safety data announced in September 2021, we target a potential NDA submission of SB206 for molluscum no later than the fourth quarter of 2022. We previously articulated a targeted NDA submission of SB206 during the third quarter of 2022, however, due to factors including supply chain constraints, impacts of the COVID-19 pandemic, certain manufacturing related equipment issues and scheduling challenges, both within our corporate facility and with third-party CMOs, we have adjusted our expected timing accordingly.

Thus, we continue to prepare for a regulatory submission and potential approval of SB206 as a treatment for molluscum. The timing of the targeted NDA submission is dependent upon: (i) completion of our new manufacturing facility to have the

infrastructure and capability necessary to produce cGMP API registration batches; (ii) continued technical transfer activities to our drug product CMO and preparing the necessary registration batches of drug product; (iii) preparatory activities and data accumulation related to the NDA submission including conducting customary drug substance and drug product stability protocols; and (iv) regulatory and quality documentation compilation related to our preclinical CMC data related to the B-SIMPLE trials, and our drug manufacturing and related processes.

We are continuing to consider and progress the prelaunch strategy and commercial preparations for SB206, if approved. We have selected Syneos Health, a fully integrated biopharmaceutical solutions organization, as our commercial solutions provider for SB206 as a treatment for molluscum. Our relationship with Syneos Health, structured as a fee-for-service arrangement, is focused on implementing the SB206 prelaunch strategy and commercial preparation, if approved by the FDA.

In September 2021, we also announced our updated strategic priorities and outlined potential key milestones. In addition to the regulatory progression of SB206, including implementing prelaunch strategy and commercial preparation, we also announced our intention to progress (a) SB204, a topical monotherapy for the treatment of acne, by (i) preparing for a pivotal Phase 3 study during 2022; (ii) targeting the conduct of a potential pivotal Phase 3 trial in 2023; and (iii) targeting a potential NDA submission of SB204 for acne in 2024; and (b) SB019, as a potential intranasal treatment option for COVID-19, by (i) targeting a Phase 1 study in healthy volunteers in 2022; (ii) targeting the conduct of a potential Phase 2/3 study(s) in 2023; and (iii) targeting a potential NDA submission of SB019 for COVID-19 in 2024. The progression of the SB019 program, subsequent to the execution of a Phase 1 study, and the progression of the SB204 program, including the execution of the potentially registrational SB204 Phase 3 trial, are subject to obtaining additional financing or strategic partnering.

Further advancement of our molluscum program beyond the potential NDA submission of SB206, or advancement of any other early-stage or late-stage clinical program across our platform, has been and may be further impacted by the COVID-19 pandemic and is subject to our ability to secure additional capital. Sources of additional capital may potentially include (i) equity or debt financings, including through sales of common stock to Aspire Capital pursuant to the July 2020 Aspire CSPA; or (ii) non-dilutive sources, such as partnerships, collaborations, licensing, grants or other strategic relationships. Our equity issuances during the year ended December 31, 2021, have resulted in significant dilution to our existing stockholders. Any issuance of equity, or debt convertible into equity, would result in further significant dilution to our existing stockholders.

Working Capital and Additional Capital Needs

As of December 31, 2021, we had a total cash and cash equivalents balance of $47.1 million and positive working capital of $43.0 million.

We will need significant additional funding to support our planned and future operating activities and make further advancements in our product development programs beyond what is currently included in our operating forecast and related cash projection. We do not currently have sufficient funds to complete commercialization of any of our product candidates, and our funding needs will largely be determined by our commercialization strategy for SB206, subject to the NDA submission timing and the regulatory approval process and outcome. We are working with Syneos Health to focus on implementing the SB206 prelaunch strategy and commercial preparation, if approved by the FDA.

We believe that our existing cash and cash equivalents balance as of December 31, 2021, plus expected contractual payments to be received in connection with existing licensing agreements, will provide us with adequate liquidity to fund our planned operating needs into the first quarter of 2023.

Please refer to the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources" in this Annual Report for further discussion of our current liquidity and our future funding needs.

Manufacturing and Supplies

We have adopted a strategy of engaging with, utilizing and relying on third parties through partnerships, collaborations, licensing or other strategic relationships for the performance of activities, processes and services that (i) do not typically result in the generation of significant new intellectual property; and (ii) can leverage their existing robust infrastructure, systems and facilities, as well as associated subject matter expertise. A parallel and inter-related strategic objective has been to manage our own internal resources, including our manufacturing capabilities.

At this stage, we intend to pursue a dual strategy of identifying and designating a partner to become the primary third-party external supplier of our proprietary berdazimer sodium (NVN1000) drug substance to support long-term manufacturing needs, while preparing internal capabilities to support small-scale and short-term manufacturing needs, including manufacture of

registration batches to support an SB206 NDA submission and initial commercialization inventory, as described in the sections entitled "Business—Manufacturing and Supplies—Drug Substance" and "Business—Manufacturing and Supplies—Internal Capability" in this Annual Report.

As discussed in the section entitled "Business—Manufacturing and Supplies—Drug Product" in this Annual Report, we have executed a master contract manufacturing agreement with Orion to enable technology transfer and manufacturing of clinical trial materials for future clinical trials with our topical product candidates in addition to potential commercial supply quantities. We continue to work toward completion of technical transfer and manufacturing activities to provide the necessary regulatory registration batches of drug product for our planned NDA submission of SB206 for molluscum, and if any of our product candidates are approved, commercial supply of drug product. A completed manufacturing technology transfer to Orion will enable the manufacture of multiple assets for supply of clinical trial materials and, potentially, commercial quantities if any of our product candidates are approved.

As we move forward with these initiatives, we will need significant additional funding to continue our operating activities, including technical transfer and manufacturing activities with third party CMOs, development and utilization of internal capabilities and cost structure changes, and to make further advancements in our product development programs, as described in the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources" in this Annual Report.

Supply Chain

We continue to assess the impact of COVID-19 on our supply chain and related vendors and global supply chain constraints across various industries, including interruption of, or delays in receiving, supplies of raw materials, API or drug product from third-party manufacturers due to staffing shortages, production slowdowns or stoppages and disruptions in delivery systems. We are also continuing to evaluate the impacts of COVID-19 and global supply chain constraints on our new facility. We expect to complete the commissioning and validation of our new facility to support various research and development and cGMP activities, including small-scale manufacturing capabilities for API and drug product, by the end of the first half of 2022. We are in the process of, and proceeding with the related preparatory activities associated with qualifying, commissioning and validating the manufacturing equipment for use in API production.

We currently rely on third-party suppliers to provide the raw materials that are used by us or our third-party manufacturers in the manufacture of our product candidates. There are a limited number of suppliers for raw materials, including nitric oxide, that we use to manufacture our product candidates. We also rely on third-party logistics vendors to transport our raw materials, API, and drug products through our supply chain. Certain materials, including our API, have designated hazard classifications that limit available transportation modes or quantities. Third-party logistics vendors may choose to delay or defer transportation of materials from time to time, especially in light of the pandemic and related global supply chain constraints, which could adversely impact the timing or cost of our manufacturing supply chain activities or other associated development activities.

The timetable for development of our product candidates has been impacted and may face further disruption and our business could be further adversely affected by the outbreak of COVID-19 and its variants. In particular, COVID-19 impacted the timing of trial initiation of our B-SIMPLE4 Phase 3 study and is one factor influencing the Company's adjustment of its targeted SB206 submission timing, planned for no later than the fourth quarter of 2022. Therefore, we continue to assess any potential further impact of COVID-19 on our operations.

As we move forward with these initiatives, we will need significant additional funding to continue our operating activities, including technical transfer and manufacturing activities with third party CMOs, development and utilization of internal capabilities and cost structure changes, and to make further advancements in our product development programs, as described in the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources" in this Annual Report.

Amended Sato Agreement

As described within the section entitled "Business—Collaboration and Licensing Agreements" in this Annual Report, in 2017, we entered into the Sato Agreement, whereby we licensed rights to develop, use, and sell SB204 in certain topical dosage forms in Japan for the treatment of acne vulgaris, and to manufacture the finished form of SB204 for sale in Japan. In October 2018, we entered into a second amendment to the Sato Agreement which expanded the Amended Sato Agreement to include SB206, our product candidate for the treatment of viral skin infections, including molluscum.

The material terms of the Amended Sato Agreement and related revenue recognition are described in "Note 4—Licensing Arrangements" and "Note 5—Revenue Recognition" to the accompanying consolidated financial statements included in this Annual Report.

COVID-19 Overview

While certain COVID-19 vaccines have been approved and are now available for use in the United States and certain other countries, we are unable to predict how widely utilized the vaccines will be, whether they will be effective in preventing the spread of COVID-19 (including its variant strains), and when or if normal economic activity and business operations will resume. Vaccine resistance, coupled with the emergence of fast-spreading variants have introduced renewed uncertainty into whether additional measures will be implemented to combat the spread of COVID-19 including in the locations where we do business. The COVID-19 pandemic has negatively impacted the global economy, disrupted global supply chains, disrupted clinical trials and created significant volatility in and disruption of financial markets. The full extent of the pandemic, related business and travel restrictions and changes to behavior intended to reduce its spread remain uncertain as the pandemic and the potential impact of variants of the virus that causes COVID-19 continue to evolve globally.

We have continued to closely monitor and rapidly respond to the ongoing impact of the COVID-19 pandemic on our employees, our community and our business operations. We have worked to continue our critical business functions, including continued operation of our development efforts, and we have adopted a series of precautionary measures and will continue to do so as the circumstances warrant, including increased sanitization of our facilities, use of personal protective equipment, as appropriate, and physical distancing practices to help protect our employees' health and safety as they continue to advance important research related to our product candidates.

Although it is not possible at this time to estimate the entirety of the impact that the COVID-19 pandemic has had or will have on our business, operations and employees, our CMOs, our contract research organizations, or CROs, our partners, our collaborators in clinical research, and our contractors, suppliers and vendors supporting our ongoing facility build-out and cGMP manufacturing capability project, any continued spread of COVID-19 and its variants, measures taken by governments, actions taken to protect employees from the pandemic, and the broad impact of the pandemic on all business activities and financial markets may materially and adversely affect our business, results of operations and financial condition and stock price. Please refer to "Results of Operations" for further discussion of these items. Due to numerous uncertainties surrounding the COVID-19 pandemic, we are unable to predict the nature and extent of the future impacts that the pandemic will have on our financial condition and operating results. These uncertainties include, among other things, the ultimate severity and duration of the pandemic, including the efficacy or availability of a treatment or vaccine for COVID-19 and its variants; governmental, business or other actions that have been, or will be, taken in response to the pandemic, including continued restrictions on travel and mobility, business closures and operating restrictions and imposition of social distancing measures; impacts of the pandemic on the conduct of our previous or potential future clinical trials, including with respect to availability of investigators and clinical trial sites, patients' ability to complete the necessary visits and clinical trial site operations, and monitoring of clinical trial data; impacts of the pandemic on regulatory authorities; and impacts of the pandemic on the United States and global economies more broadly. For additional information about risks and uncertainties related to the COVID-19 pandemic that may impact our business, our financial condition or our results of operations, see the section entitled "Risk Factors" in this Annual Report.

Corporate Updates

Chief Commercial Officer

On November 2, 2021, we announced the appointment of Brian J. Johnson, MBA, as our Chief Commercial Officer. Mr. Johnson's experience includes implementing commercial strategy and message development through tactical planning and execution at dermatology companies such as Ortho Pharmaceutical Corporation, Medicis, and Galderma. From 2015 to 2018, Mr. Johnson served as Chief Commercial Officer of Novan, where he led pre-commercial activities including the assessment of the molluscum contagiosum market opportunity and the acne market sizing and segmentation project.

June 2021 Public Offering

On June 17, 2021, we entered into an underwriting agreement with Cantor Fitzgerald & Co. relating to the offering, issuance and sale of 3,636,364 shares of common stock. The June 2021 Public Offering closed on June 21, 2021. Net proceeds from the June 2021 Public Offering were approximately $37.2 million after deducting underwriting discounts and commissions and offering expenses of approximately $2.8 million.

See "Note 10—Stockholders' Equity (Deficit)" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the June 2021 Public Offering.

Reverse Stock Split

On July 28, 2020, our stockholders approved a proposal to amend our restated certificate of incorporation to effect a reverse stock split of our common stock at a ratio of not less than one-for-two and not more than one-for-fifteen, with such ratio and the implementation and timing of such reverse stock split to be determined by our board of directors in its sole discretion. On May 18, 2021, our board of directors approved a one-for-ten reverse stock split of our issued and outstanding common stock, or the Reverse Stock Split. On May 24, 2021, we filed with the Secretary of State of the State of Delaware a Certificate of Amendment to our Restated Certificate of Incorporation in order to effect the Reverse Stock Split, or the Charter Amendment. The Reverse Stock Split became effective at 5:00 pm Eastern Time on May 25, 2021. Pursuant to the Charter Amendment, on the effective date thereof, each outstanding ten (10) shares of common stock combined into and became one (1) share of common stock and the number of our issued and outstanding shares of common stock was reduced to 15,170,678. The new CUSIP number for our common stock is 66988N205.

All references to numbers of shares of common stock and per-share information in this Annual Report have been adjusted retroactively, as appropriate, to reflect the Reverse Stock Split.

See "Note 10—Stockholders' Equity (Deficit)" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the Reverse Stock Split.

Paycheck Protection Program

On April 22, 2020, we entered into a promissory note for an unsecured loan in the amount of approximately $1.0 million under the Paycheck Protection Program, or PPP. The PPP was established under the Coronavirus Aid, Relief, and Economic Security Act, or the CARES Act, and is administered by the U.S. Small Business Administration. The loan to the Company under the PPP was made through PNC Bank, National Association. We applied for and during the second quarter of 2021 received notification of forgiveness of the entire loan balance, including any accrued interest.

See "Note 9—Paycheck Protection Program" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the Loan.

Triangle Business Center Facility Lease

On January 18, 2021, we entered into a lease with an initial term expiring in 2032, which has subsequently been amended, for 19,265 rentable square feet located in Durham, North Carolina. This site serves as our corporate headquarters and will support various cGMP activities, including research and development and small-scale manufacturing capabilities. These capabilities include the infrastructure necessary to support small-scale drug substance manufacturing and the ability to act as a primary, or secondary backup, component of a potential future commercial supply chain.

We are preparing our new location to support various cGMP activities, including research and development and small-scale manufacturing capabilities, as described in the section entitled "Business—Manufacturing and Supplies" in this Annual Report.

See "Note 8—Commitments and Contingencies" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the previous facility lease transaction.

Financial Overview

Since our incorporation in 2006, we have devoted substantially all of our efforts to developing our nitric oxide platform technology and resulting product candidates, including conducting preclinical and clinical trials and providing general and administrative support for these operations. We conduct these activities in a single operating segment. To date, we have focused our funding activities primarily on equity and strategic relationships. However, other historical forms of funding have included payments received from licensing and supply arrangements, as well as government research contracts.

We have never generated revenue from product sales and have incurred net losses in each year since inception. As of December 31, 2021, we had an accumulated deficit of $279.0 million, and there is substantial doubt about our ability to continue as a going concern. We incurred net losses of $29.7 million and $29.3 million in the years ended December 31, 2021 and 2020, respectively. We expect to continue to incur substantial losses in the future as we conduct our planned operating activities. We do not expect to generate revenue from product sales unless and until we obtain regulatory approval from the FDA for our clinical-stage product candidates. If we obtain regulatory approval for any of our product candidates, we and/or our commercial partners would expect to incur significant expenses related to product sales, marketing, manufacturing and distribution.

Please refer to the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources" in this Annual Report for further discussion of our current liquidity and our future funding needs.

Components of our Results of Operations

Revenue

License and collaboration revenue consists of the amortization of certain fixed and variable consideration under the Amended Sato Agreement that (i) has been received to date in the form of upfront and milestone payments; or (ii) are future, non-contingent milestone payments that become payable upon the earlier occurrence of specified fixed dates in the future or the achievement of specified milestone events. This consideration is being recognized on a straight-line basis over the estimated performance period.

In November 2020, Sato determined its initial Japanese Phase 1 study for SB206 would require an amended design, including evaluation of potential lower dose strengths, to further refine dose tolerability in a subsequent Phase 1 study. Based upon (i) the need for an additional Phase 1 study; (ii) Sato's estimated comprehensive developmental schedule for SB206 including additional post-Phase 1 clinical trials; and (iii) current and future Japanese clinical trial material manufacturing and technical transfer considerations, we concluded that a prospective delay in Sato's overall SB206 development plan had occurred. We estimated the program timeline to be extended by 1.75 years from our previous estimate, and a corresponding extension of the performance period estimate to 9.25 years, completing in the second quarter of 2026.

In late July 2021, Sato communicated an updated plan regarding its amended design for its additional Japanese Phase 1 study for SB206. The amended study design includes evaluation of potential lower dose strengths, including potential further refinement in a subsequent dose tolerability study. As part of the communication regarding these Phase 1 studies, Sato also communicated an updated comprehensive timeline for the Japanese SB206 program. The updated timeline assumes that the 12% formulation is appropriate to proceed for development in Japan, and is to be reassessed based on the findings of the Phase 1 study.

Based upon (i) the expected timing of the additional Phase 1 study, including a subsequent dose tolerability study; (ii) Sato's estimated comprehensive developmental schedule for SB206, including additional post-Phase 1 clinical trials; and (iii) current and future Japanese clinical trial material manufacturing and technical transfer considerations, including the manufacturing site for drug product, we concluded that a prospective delay in Sato's overall SB206 Japanese development plan had occurred in July 2021. We estimate the program timeline to be extended by 0.75 years from our previous estimate, and a corresponding extension of the performance period estimate to 10 years, completing in the first quarter of 2027. We understand that the progression of the Japanese SB204 program could follow the same timeline as the Japanese SB206 program, subject to the nature of the results of Sato's comprehensive asset developmental program, including SB206. This estimated timeline remains subject to prospective reassessment and adjustment based upon Sato's interaction with the Japanese regulatory authorities and other developmental and timing considerations.

The material terms of the Amended Sato Agreement and related revenue recognition are described in "Note 4—Licensing Arrangements" and "Note 5—Revenue Recognition" to the accompanying consolidated financial statements included in this Annual Report.

Government Contracts and Grants Revenue

Government research contracts and grant revenue relates to the research and development of our nitric oxide platform for preclinical advancement of NCEs and formulations related to potential treatments for illnesses in the women's health field. Revenue related to conditional government contracts and grants is recognized when qualifying expenses are incurred.

Research and Development Expenses

Since our incorporation, we have focused our resources on our research and development activities, including conducting preclinical studies and clinical trials, manufacturing development efforts and activities related to regulatory filings for our product candidates. Research and development expenses, including those paid to third parties for which there is no alternative use, are expensed as they are incurred. Research and development expenses include:

- external research and development expenses incurred under agreements with CROs, investigative sites and consultants to conduct our clinical trials and preclinical studies;
- costs to acquire, develop and manufacture supplies for clinical trials and preclinical studies at our facilities;
- costs to establish drug substance and drug product manufacturing capabilities with external CMOs and to enhance drug delivery device technologies through partnerships with technology manufacturing vendors;
- legal and other professional fees related to compliance with FDA requirements;
- licensing fees and milestone payments incurred under license agreements;
- salaries and related costs, including stock-based compensation, for personnel in our research and development functions; and
- facilities, depreciation and other allocated expenses, which include direct and allocated expenses for rent, maintenance of facilities, utilities, equipment and other supplies.

From our incorporation through December 31, 2021, we have incurred approximately $202.3 million in research and development expenses to develop, expand or otherwise improve our nitric oxide platform and resulting product candidates. This amount is net of $10.5 million of aggregate contra-research and development expense representing amortization of the liability related to the $12.0 million of funding received from Ligand to pursue the development and regulatory approval of SB206. For the year ended December 31, 2021, and 2020, we recognized amortization, or a decrease in contra-research and development expense, of $0.1 million and $2.2 million respectively.

For a description of the methodology and assumptions used to recognize the ratable amortization of this liability, as well as other information about the Funding Agreement with Ligand, please see "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements included in this Annual Report.

The table below sets forth our research and development expenses incurred for external clinical programs and the related product candidates, and other research and development expenses for the years ended December 31, 2021 and 2020. Other research and development expenses include: (i) all preclinical program and development costs, including WH504, WH602 and SB019; (ii) manufacturing capability and campaign costs; (iii) external costs to establish drug substance and drug product manufacturing capabilities at third-party CMOs; (iv) facility and infrastructure costs, excluding capital costs subject to depreciation; and (v) costs related to all research and development salaries and related personnel costs.

	Year Ended December 31,	
	2021	2020
	(in thousands)	
External clinical programs:		
SB204	$ 22	$ —
SB206 (1)	9,948	8,556
SB414	2	271
Other research and development	10,444	10,987
Total research and development expenses	$ 20,416	$ 19,814

(1) Amounts shown net of $0.1 million and $2.2 million of contra-research and development expense recorded for the years ended December 31, 2021 and 2020, respectively, related to the Funding Agreement with Ligand described in the section entitled "Business—Research and Development Arrangements" in this Annual Report and in "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements included in this Annual Report.

During the year ended December 31, 2021, our major clinical development activities were primarily associated with the continued conduct of our current SB206 Phase 3 clinical program activities. Our plan and timelines for further clinical development of SB206 have been and may be further impacted by the COVID-19 pandemic. We expect that for the foreseeable future, the substantial majority of our research and development efforts will be focused on: (i) preparing for and seeking U.S. regulatory approval of SB206 as a treatment for molluscum; (ii) conducting drug manufacturing capability transfer activities to external third-party CMOs, including a drug delivery device technology enhancement project; (iii) developmental and regulatory activities for our SB019 program (Coronaviridae (COVID-19)), including a Phase 1 study, targeted for initiation in 2022; and (iv) preparatory activities for a potential Phase 3 study, targeted for initiation in 2023, related to SB204 as a treatment for acne.

We also expect to incur substantial costs in 2022 associated with our research and development personnel, and certain manufacturing capability costs related to the infrastructure necessary to support small-scale drug substance and drug product manufacturing operations at our new corporate headquarters, including capital costs subject to depreciation and various ongoing operating costs. We may decide to revise our development and operating plans or the related timing, depending on information we learn through our research and development activities, including regulatory submission efforts related to SB206, potential SB206 commercialization strategies developed in conjunction with Syneos Health, the impact of outside factors such as the COVID-19 pandemic, our ability to enter into strategic arrangements, our ability to access additional capital and our financial priorities.

The successful development and potential for regulatory approval of our product candidates is highly uncertain. At this time, we cannot reasonably estimate the nature, timing or costs required to complete the remaining development of our current product candidates or any future product candidates. This is due to the numerous risks and uncertainties associated with the development of product candidates. See the section entitled "Risk Factors" in this Annual Report for a discussion of the risks and uncertainties associated with our research and development projects.

General and Administrative Expenses

Our general and administrative expenses consist primarily of salaries and related costs, including stock-based compensation expenses for personnel in our executive, finance, corporate development and other administrative functions. Other general and administrative expenses include market research costs, prelaunch strategy costs, including medical affairs, and commercial preparation activities for SB206, allocated depreciation and facility-related costs, legal costs of pursuing patent protection of our intellectual property, insurance coverage and professional services fees for auditing, tax, general legal, business development, litigation defense and other corporate and administrative services.

We expect to continue to incur substantial general and administrative expenses in 2022 in support of our prelaunch strategy and commercial preparation activities for SB206. We may decide to revise our plans or the related timing associated with our prelaunch strategy and commercial preparation activities for SB206, depending on information we learn through our regulatory submission process and potential SB206 commercialization strategies developed in conjunction with Syneos Health.

We also expect to continue to incur substantial general and administrative expenses in 2022 in support of our operating activities and as necessary to operate in a public company environment. Significant general and administrative expenses associated with operations in a public company environment include legal, accounting, regulatory and tax-related services associated with maintaining compliance with exchange listing and SEC requirements, directors' and officers' liability insurance premiums and investor relations activities.

Impairment loss on long-lived assets

As of June 29, 2020, we evaluated all of our long-lived assets for potential held for sale classification, and assessed our remaining long-lived assets classified as held and used for potential impairment pursuant to accounting policies described in "Note 1—Organization and Significant Accounting Policies" to the accompanying consolidated financial statements included in this Annual Report. This evaluation and assessment was triggered by the decommissioning of our large scale drug manufacturing capability at our previous Morrisville, North Carolina, facility and by preparatory actions taken in connection with the planned lease termination transaction for the facility that was executed in July 2020. In connection with this evaluation and impairment assessment, which is described in the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations—Results of Operations—Impairment loss on long-lived assets" in this Annual Report and in "Note 16—Assets Held for Sale, Impairment Charges" to the accompanying consolidated financial statements included in this Annual Report, we recognized an impairment loss on long-lived assets that represent the carrying value in excess of fair value of assets held and used or the carrying value in excess of fair value less cost to sell for assets held for sale.

Loss on facility asset group disposition

In conjunction with the lease termination transaction executed in July 2020, all assets and liabilities within the related facility asset group were disposed of on July 16, 2020. As of the disposition date, the net aggregate carrying value of the assets and liabilities was written off, combined with certain other direct costs incurred in connection with the lease termination transaction, which resulted in a loss on disposition, which is described in "Note 17—Asset Group Disposition" to the accompanying consolidated financial statements included in this Annual Report.

Other Income (Expense), net

Other income (expense), net consists primarily of (i) foreign currency adjustments related to the contract asset and contract receivables related to the Amended Sato Agreement; (ii) gain on extinguishment of debt related to the forgiveness of our PPP loan; (iii) interest income earned on cash and cash equivalents; and (iv) other miscellaneous income and expenses.

Results of Operations

Comparison of the Years Ended December 31, 2021 and 2020

The following table sets forth our results of operations for the periods indicated:

	Year Ended December 31,			
	2021	2020	$ Change	% Change
	(in thousands, except percentages)			
License and collaboration revenue	$ 2,822	$ 4,208	$ (1,386)	(33) %
Government research contracts and grants revenue	136	712	(576)	(81) %
Total revenue	2,958	4,920	(1,962)	(40) %
Operating expenses:				
Research and development	20,416	19,814	602	3 %
General and administrative	12,343	11,271	1,072	10 %
Impairment loss on long-lived assets	114	2,277	(2,163)	(95) %
Loss on facility asset group disposition	—	1,772	(1,772)	*
Total operating expenses	32,873	35,134	(2,261)	(6) %
Operating loss	(29,915)	(30,214)	299	(1) %
Other income (expense), net:				
Interest income	13	51	(38)	(75) %
Gain on debt extinguishment	956	—	956	*
Other (expense) income	(746)	870	(1,616)	(186) %
Total other income (expense), net	223	921	(698)	(76) %
Net loss and comprehensive loss	$ (29,692)	$ (29,293)	$ (399)	1 %

** Not meaningful*

Revenue

License and collaboration revenue of $2.8 million and $4.2 million for the years ended December 31, 2021 and 2020, respectively, was associated with our performance during the period and the related amortization of the non-refundable upfront and expected milestone payments under the Amended Sato Agreement. The change in revenue recognized for the years ended December 31, 2021 and 2020 relates to changes in estimates related to the expected duration of the combined SB204 and SB206 development program timeline. A change in estimate occurred in November 2020, and again in July 2021. The most recent change in estimate resulted in a program timeline extension of the performance period estimate to 10 years, completing in the first quarter of 2027. The material terms of the Amended Sato Agreement and related revenue recognition are described in "Note 4—Licensing Arrangements" and "Note 5—Revenue Recognition" to the accompanying consolidated financial statements included in this Annual Report.

Government research contracts and grants revenue totaled $0.1 million and $0.7 million for the years ended December 31, 2021 and 2020, respectively. For the years ended December 31, 2021 and 2020, we recognized revenue of less than $0.1 million and $0.5 million, respectively, related to the $1.1 million grant we received in September 2019 from the DoD's CDMRP as part of its Peer Reviewed Cancer Research Program. For the years ended December 31, 2021 and 2020, we recognized revenue of $0.1 million and $0.2 million, respectively, related to the $1.0 million grant we received in February 2020 from the NIH and to the $0.2 million grant received in September 2019 from the NIH.

Research and development expenses

Research and development expenses were $20.4 million for the year ended December 31, 2021, compared to $19.8 million for the year ended December 31, 2020. The net increase of $0.6 million, or 3% was primarily related to (i) a net $1.4 million increase in the SB206 program, (ii) a $0.5 million decrease in other research and development expenses and (iii) a $0.3 million decrease in our SB414 program.

In the SB206 program, we experienced (i) a $2.6 million decrease in gross clinical trial costs primarily due to the conduct and completion of the B-SIMPLE4 Phase 3 trial during the year ended December 31, 2021, compared to the relatively higher cost of B-SIMPLE4 Phase 3 trial start-up and conduct activities and B-SIMPLE 1 and B-SIMPLE 2 Phase 3 trial wind down activities during the comparative year ended December 31, 2020, (ii) a $1.9 million increase in regulatory consulting services, stability and other analytical testing services, and CMC consulting services and materials in support of our planned SB206 NDA submission, and (iii) a $2.1 million decrease in contra-research and development expense from the ratable amortization of the Ligand Funding Agreement liability, which represents Ligand's contribution to specified clinical development and regulatory activities for SB206 as a treatment for molluscum. The SB206 clinical development activities conducted during the comparative period in 2020, including but not limited to the B-SIMPLE 1 and B-SIMPLE 2 Phase 3 trials, were eligible for Ligand contribution and associated amortized contra-research and development expense recognition, but the B-SIMPLE 4 Phase 3 trial conducted during a portion of the comparative year ended December 31, 2020 and during the current year ended December 31, 2021 was not eligible for Ligand contributions and therefore no contra-research and development expense was recognized against the gross B-SIMPLE 4 trial costs. During the year ended December 31, 2021 and 2020 we recorded $0.1 million and $2.2 million, respectively, of contra-research and development expense, related to amortization of the liability related to the Funding Agreement with Ligand, based on our reassessment of the estimated total cost to progress the SB206 program to a potential United States regulatory approval. Further information regarding our reassessment of the SB206 program is described in "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements.

The $0.5 million decrease in other research and development expenses was primarily driven by (i) a $1.6 million net decrease in research and development personnel costs, (ii) a $0.8 million net decrease in rent and depreciation expense following the reduction of our real estate footprint due to the exit and the lease termination of our former Morrisville, North Carolina facility completed in the third quarter of 2020, (iii) $0.3 million of discrete facility decommissioning costs incurred in the second and third quarters of 2020 associated with our former Morrisville, North Carolina facility, and (iv) a $0.7 million decrease in our preclinical, grant-funded WH602 and WH604 programs; partially offset by (i) $1.2 million costs incurred during the year ended December 31, 2021 related to our *in vitro* and *in vivo* studies to evaluate our SB019 product candidate as an intranasal treatment option for COVID-19, (ii) a $1.0 million net increase in external drug manufacturing technology transfer projects ongoing with our contract manufacturing partners, (iii) a $0.6 million net increase in other facility preparation and operating service costs, and (iv) $0.1 million costs incurred during the year ended December 31, 2021 associated with exploratory work to evaluate our new chemical entity, NVN4100, as a potential product candidate for antimicrobial indications in companion animal health.

The $1.6 million net decrease in research and development personnel costs is primarily due to (i) a $0.7 million decrease in non-cash compensation expense related to the change in the fair value of our Tangible Stockholder Return Plan, (ii) a $0.4 million decrease in non-cash compensation expense associated with stock option compensation, (iii) a $0.4 million decrease in discrete severance charges and retention incentive compensation associated with business realignment and personnel reduction actions taken during the first quarter of 2020, and (iv) a $0.1 million decrease in recurring salary and benefits costs due to a reduced number of research and development personnel between the two comparative periods.

General and administrative expenses

General and administrative expenses were $12.3 million for the year ended December 31, 2021, compared to $11.3 million during the year ended December 31, 2020. The increase of approximately $1.1 million, or 10% from the prior year was primarily due to (i) a $0.9 million increase in insurance premium expenses associated with our directors' and officers' liability policies, (ii) a $0.3 million net increase in general and administrative personnel and related costs, and (iii) a $1.9 million increase in SB206 prelaunch strategy and commercial preparation costs; partially offset by (i) $1.7 million of aggregate non-cash expense recognized during 2020 related to the issuance of commitment shares in consideration for entering into the June 2020 Aspire CSPA and July 2020 Aspire CSPA and (ii) a $0.3 million decrease in rent and depreciation expense following the reduction of our real estate footprint within our Morrisville, North Carolina facility after the lease termination completed in the third quarter of 2020.

The $0.3 million net increase in general and administrative personnel and related costs includes (i) a $0.3 million increase in cash-based compensation expenses related to a success bonus paid to all employees following the announcement of the positive top-line results of our B-SIMPLE 4 study and hiring bonuses for new employees and (ii) a $0.3 million increase in non-cash compensation expense associated with stock option compensation, which was offset with a $0.3 million decrease in non-cash compensation expenses related to the change in the fair value of our Performance Plan liability.

Impairment loss on long-lived assets

As of June 29, 2020, we evaluated all of our long-lived assets for potential held for sale classification, and assessed our remaining long-lived assets classified as held and used for potential impairment pursuant to accounting policies described in "Note 1—Organization and Significant Accounting Policies" to the accompanying consolidated financial statements included in this Annual Report. Our evaluation resulted in a $2.4 million non-cash impairment loss on long-lived assets recognized during the quarterly period ended June 30, 2020, comprised of (i) a $0.9 million impairment charge recognized on the asset group associated with the Morrisville, North Carolina facility, including the right-of-use asset, leasehold improvements and other property affixed to the facility, (ii) a $0.2 million impairment charge recognized on furniture and equipment to be sold to our landlord's new tenant pursuant to a bill of sale described in "Note 8—Commitments and Contingencies" to the accompanying consolidated financial statements included in this Annual Report, (iii) a $0.8 million impairment charge recognized on certain manufacturing and laboratory equipment that we intended to sell through a consignment seller, and (iv) a $0.5 million impairment charge recognized on equipment and other property not directly associated with our continuing research and development and pilot scale drug manufacturing capabilities.

During the fourth quarter of 2020, certain equipment assets we had previously classified as held for sale during the aforementioned June 29, 2020 evaluation were reclassified as held and used. The reclassification determination was based upon new facts and circumstances that enabled us to re-use the equipment in connection with our planned build-out of our newly leased facility in Durham, North Carolina. Upon reclassification to assets held and used, we avoided certain estimated selling costs that had been included in the previously recognized impairment charge during the quarterly period ended June 30, 2020 and, as a result, we recognized a $0.1 million favorable adjustment to the impairment charge during the quarterly period ended December 31, 2020.

During the second quarter of 2021, we assessed the carrying value of a disposal group classified as assets held for sale in the consolidated balance sheets. The disposal group and related assets consisted of certain manufacturing and laboratory equipment associated with our previous large scale drug manufacturing capability that was being sold over time through a consignment seller. Based on our assessment of the disposal group's recoverability, during the second quarter of 2021, we recognized a $0.1 million non-cash impairment loss on long-lived assets that represented the full write off of its remaining carrying value.

For additional information regarding our impairment evaluation see "Note 16—Assets Held for Sale, Impairment Charges" to the accompanying consolidated financial statements included in this Annual Report.

Loss on facility asset group disposition

In conjunction with the lease termination transaction as described in "Note 8—Commitments and Contingencies" to the accompanying consolidated financial statements included in this Annual Report, all assets and liabilities within the facility asset group were disposed of on July 16, 2020. As of the disposition date, the aggregate carrying value of the assets was $7.3 million and the aggregate carrying value of the associated lease liabilities was $6.0 million. The $1.3 million net charge resulting from the write-off of these assets and liabilities was combined with $0.5 million of other direct costs incurred in connection with the lease termination transaction to result in a $1.8 million total loss on disposition. This loss, which is in addition to the impairment loss recognized during the quarterly period ended June 30, 2020 and described in "Note 16—Assets Held for Sale, Impairment Charges" to the accompanying consolidated financial statements, was based upon Company-specific facts and circumstances associated with the July 2020 lease termination transaction, rather than the market participant valuation model that was required to be used during the impairment assessment as of June 29, 2020.

For additional information regarding our facility asset group disposition see "Note 17—Asset Group Disposition" to the accompanying consolidated financial statements included in this Annual Report.

Other income (expense), net

Other income (expense), net was $0.2 million income for the year ended December 31, 2021, compared to $0.9 million income for the year ended December 31, 2020. This change was primarily due to a $1.6 million negative impact of foreign currency exchange rate fluctuations over the comparative periods for certain time-based milestones related to the Amended Sato

Agreement, partially offset by a $1.0 million gain on debt extinguishment related to the forgiveness of our PPP loan in June 2021.

Liquidity and Capital Resources

As of December 31, 2021, we had an accumulated deficit of $279.0 million. We incurred net losses of $29.7 million and $29.3 million in the years ended December 31, 2021 and 2020, respectively, and there is substantial doubt about our ability to continue as a going concern. We anticipate that we will continue to generate losses for the foreseeable future, and we expect the losses to increase as we continue the development of, and seek regulatory approvals for, our product candidates and potentially begin commercialization activities. We are subject to all of the risks inherent in the development of new pharmaceutical products, and we may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. We do not expect to generate revenue from product sales unless and until we obtain regulatory approval from the FDA for our clinical-stage product candidates. If we obtain regulatory approval for any of our product candidates, we and/or our commercial partners and commercial solutions providers would expect to incur significant expenses related to product sales, marketing, manufacturing and distribution.

As of December 31, 2021, we had a total cash and cash equivalents balance of $47.1 million and positive working capital of $43.0 million.

From January 1, 2020 through December 31, 2021, we have raised total equity and debt proceeds of $96.9 million to fund our operations, including (i) $37.2 million in net proceeds from the sale of common stock in the June 2021 public offering (as defined below); (ii) $5.2 million in net proceeds from the sale of common stock (or pre-funded warrants in lieu thereof) and accompanying common warrants in the March 2020 Public Offering (as defined below); (iii) $7.2 million in net proceeds from the sale of common stock (or pre-funded warrants in lieu thereof) in the March 2020 Registered Direct Offering (as defined below); (iv) an additional $6.0 million of proceeds associated with exercises through December 31, 2021 of common warrants issued as part of the March 2020 Public Offering and March 2020 Registered Direct Offering; (v) $40.3 million in proceeds from the sale of common stock under the July 2020 Aspire CSPA and the common stock purchase agreements entered into with Aspire Capital dated August 30, 2019 and June 16, 2020; and (vi) less than $0.1 million of proceeds from the exercise of stock options. We also obtained a loan under the PPP (as defined below) of approximately $1.0 million in April 2020 to support certain qualified expenses, including payroll and rental expense, which is described below. The PPP loan was forgiven in June 2021.

To date, we have focused our funding activities primarily on equity financings, while generating additional liquidity and capital through other sources, including: (i) governmental research contracts and grants totaling $12.9 million; (ii) our licensing and supply arrangements with Sato, totaling $28.8 million; and (iii) $25.0 million and $12.0 million in proceeds from two funding transactions during the second quarter of 2019 with Reedy Creek Investments LLC, or Reedy Creek, and Ligand, respectively, as described below.

We believe that our existing cash and cash equivalents balance as of December 31, 2021, plus expected contractual payments to be received in connection with existing licensing agreements, will provide us with adequate liquidity to fund our planned operating needs into the first quarter of 2023. This operating forecast and related cash projection includes: (i) costs associated with preparing for and seeking U.S. regulatory approval of SB206 as a treatment for molluscum, including costs to prepare for a pre-NDA meeting with the FDA and NDA-enabling drug stability studies for SB206; (ii) costs associated with the completion and readiness of our new corporate headquarters and manufacturing capability necessary to support small-scale drug substance and drug product manufacturing; (iii) conducting drug manufacturing activities with external third-party CMOs, including a drug delivery device technology enhancement project; (iv) developmental and regulatory activities for our SB019 program (Coronaviridae (COVID-19)), including a Phase 1 study, targeted for conduct in 2022; (v) preparatory activities for a potential Phase 3 study, targeted for initiation in 2023, related to SB204 as a treatment for acne; and (vi) initial efforts to support potential commercialization of SB206, but excludes: (a) any potential costs associated with other late-stage clinical programs, including executing the potentially registrational Phase 3 study of SB204 for acne; (b) progression of the SB019 program subsequent to execution of a Phase 1 study; (c) operating costs that could occur between a potential NDA submission for SB206 through NDA approval, specifically including marketing and commercialization efforts to achieve potential launch of SB206; and (d) proceeds from any potential future sales of common stock under the July 2020 Aspire CSPA. We may decide to revise our development and operating plans or the related timing, depending on information we learn through our research and development activities, including regulatory submission efforts related to SB206, potential commercialization strategies, the impact of outside factors such as the COVID-19 pandemic, our ability to enter into strategic arrangements or other transactions, our ability to access additional capital and our financial priorities.

Our ability to continue to operate our business, including our ability to advance development programs unrelated to SB206, as well as our ability to progress SB206 for molluscum subsequent to an NDA submission, is dependent upon our ability to access additional sources of capital, including, but not limited to (i) equity or debt financings, including through potential sales using the remaining availability under the July 2020 Aspire CSPA; or (ii) non-dilutive sources, such as partnerships, collaborations, licensing, grants or other strategic relationships. There can be no assurance that we will be able to obtain new funding on terms acceptable to us, on a timely basis, or at all. Our inability to obtain significant additional funding on acceptable terms could have a material adverse effect on our business and cause us to alter or reduce our planned operating activities, including but not limited to delaying, reducing, terminating or eliminating planned product candidate development activities, to conserve our cash and cash equivalents. Our anticipated expenditure levels may change if we adjust our current operating plan. Such actions could delay development timelines and have a material adverse effect on our business, results of operations, financial condition and market valuation. We are also exploring the potential for strategic transactions, such as strategic acquisitions or in-licenses, sales or divestitures of some of our assets, or other potential strategic transactions, which could include a sale of the company. If we were to pursue such a transaction, we may not be able to complete the transaction on a timely basis or at all or on terms that are favorable to us.

We will need significant additional funding to support our planned and future operating activities and make further advancements in our product development programs beyond what is currently included in our operating forecast and related cash projection. We do not currently have sufficient funds to complete commercialization of any of our product candidates, and our funding needs will largely be determined by our commercialization strategy for SB206, subject to the NDA submission timing and the regulatory approval process and outcome. Therefore, we will need to secure additional capital or financing and/or delay, defer or reduce our cash expenditures by the first quarter of 2023. There can be no assurance that we will be able to obtain additional capital or financing on terms acceptable to us, on a timely basis or at all.

Our cash and cash equivalents are held in a variety of interest-bearing instruments, including money market accounts. Cash in excess of immediate requirements is invested with a view toward liquidity and capital preservation, and we seek to minimize the potential effects of concentration and degrees of risk.

Purchase Agreements with Aspire Capital

Common Stock Purchase Agreements

On July 21, 2020, we entered into the July 2020 Aspire CSPA which provides that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital is committed to purchase up to an aggregate of $30.0 million of shares of our common stock at our request from time to time during the 30-month term of the July 2020 Aspire CSPA. The July 2020 Aspire CSPA replaced prior agreements with Aspire Capital entered into on August 30, 2019, or the 2019 Aspire CSPA, and June 15, 2020, or the June 2020 Aspire CSPA, which provided that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital was committed to purchase up to an aggregate of $25.0 million and $20.0 million, respectively.

For the years ended December 31, 2021 and 2020, total proceeds from the issuance of common stock related to the August 2019 Aspire CSPA, June 2020 Aspire CSPA and July 2020 Aspire CSPA were $6.3 million and $33.9 million, respectively.

As of December 31, 2021, the Company had $12.0 million in remaining availability for sales of its common stock under the July 2020 Aspire CSPA, subject to certain limitations.

See "Note 10—Stockholders' Equity (Deficit)" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the 2019 Aspire CSPA, the June 2020 Aspire CSPA and the July 2020 CSPA.

Equity Offerings

June 2021 Public Offering

On June 17, 2021, we entered into an underwriting agreement with Cantor Fitzgerald & Co. relating to the offering, issuance and sale of 3,636,364 shares of common stock. We also granted Cantor Fitzgerald & Co., as underwriter, a 30-day option to purchase up to 545,454 additional shares of common stock, which was not exercised. The June 2021 Public Offering closed on June 21, 2021.

Net proceeds from the June 2021 Public Offering were approximately $37.2 million after deducting underwriting discounts and commissions and offering expenses of approximately $2.8 million.

See "Note 10—Stockholders' Equity (Deficit)" to the accompanying consolidated financial statements for additional information regarding the June 2021 Public Offering.

March 2020 Registered Direct Offering

On March 24, 2020, we entered into a securities purchase agreement with several institutional and accredited investors, pursuant to which we agreed to sell and issue in a registered direct offering priced at-the-market under Nasdaq rules, or the March 2020 Registered Direct Offering, an aggregate of 1,055,000 shares of our common stock and pre-funded warrants to purchase 805,465 shares of common stock. The March 2020 Registered Direct Offering closed on March 26, 2020. At closing, we also issued to H.C. Wainwright, as placement agent, warrants to purchase an aggregate of up to 55,814 shares of common stock representing 3.0% of the aggregate number of shares of common stock and shares of common stock underlying the pre-funded warrants sold in this offering.

Net proceeds from the March 2020 Registered Direct Offering were approximately $7.2 million after deducting the fees and commissions and offering expenses of approximately $0.8 million.

See "Note 10—Stockholders' Equity (Deficit)" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the March 2020 Registered Direct Offering.

March 2020 Public Offering

On February 27, 2020, we entered into an underwriting agreement with H.C. Wainwright relating to the offering, issuance and sale of 1,400,000 shares of common stock, pre-funded warrants to purchase 433,333 shares of common stock, and accompanying common warrants to purchase up to an aggregate of 1,833,333 shares of common stock, or, collectively, the March 2020 Public Offering. We also granted H.C. Wainwright, as underwriter, a 30-day option to purchase up to 275,000 additional shares of common stock and/or common warrants to purchase up to an aggregate of 275,000 shares of common stock, which H.C. Wainwright partially exercised on March 2, 2020 to purchase 149,860 shares of common stock and common warrants to purchase 275,000 shares of common stock. The March 2020 Public Offering closed on March 3, 2020. At closing, we also issued to designees of H.C. Wainwright, as underwriter, warrants to purchase an aggregate of up to 59,496 shares of common stock representing 3.0% of the aggregate number of shares of common stock sold and shares of common stock underlying the pre-funded warrants sold in this offering.

Net proceeds from the March 2020 Public Offering were approximately $5.2 million after deducting underwriting discounts and commissions and offering expenses of approximately $0.8 million.

See "Note 10—Stockholders' Equity (Deficit)" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the March 2020 Public Offering.

Paycheck Protection Program

On April 22, 2020, we entered into a promissory note, which was subsequently amended, or the Note, for an unsecured loan in the amount of approximately $1.0 million, or the Loan, under the Paycheck Protection Program, or the PPP. The PPP was established under the CARES Act and is administered by the United States Small Business Administration, or the SBA. The Loan to us was made through PNC Bank, National Association. Subject to the terms of the Note, the Loan bears interest at a fixed rate of one percent (1%) per annum. We previously applied for and during the second quarter of 2021 received notification of forgiveness of the entire loan balance, including any accrued interest.

See "Note 9—Paycheck Protection Program" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the Loan.

Research and Development Arrangements

Royalty and Milestone Payments Purchase Agreement with Reedy Creek Investments LLC

On April 29, 2019, we entered into a royalty and milestone payments purchase agreement, or the Purchase Agreement, with Reedy Creek, pursuant to which Reedy Creek provided us funding in an initial amount of $25.0 million for us to use primarily to pursue the development, regulatory approval and commercialization (including through out-license agreements and other third-party arrangements) activities for SB206, as a treatment for molluscum, and advance programmatically other activities with respect to SB414, for atopic dermatitis, and SB204, for acne.

Pursuant to the Purchase Agreement, we will pay Reedy Creek ongoing quarterly payments, calculated based on an applicable percentage per product of any upfront fees, milestone payments, royalty payments or equivalent payments received by us pursuant to any out-license agreement for the products in the United States, Mexico or Canada, net of any upfront fees,

milestone payments, royalty payments or equivalent payments paid by us to third parties pursuant to any agreements under which we have in-licensed intellectual property with respect to the products.

The applicable percentage used for determining the ongoing quarterly payments, applied to amounts received directly by us pursuant to any out-license agreement for each product, ranges from 10% for SB206 to 20% for SB414 and SB204. However, the agreement provides that the applicable percentage for each product will be 25% for fees or milestone payments received by us (but not royalty payments received by us) until Reedy Creek has received payments under the Purchase Agreement equal to the total funding amount provided by Reedy Creek under the Purchase Agreement. If we decide to commercialize any product on our own following regulatory approval, as opposed to commercializing through an out-license agreement or other third-party arrangement, we will only be obligated to pay Reedy Creek a low single digits royalty on net sales of the products.

See "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements included in this Annual Report for additional information related to the Purchase Agreement.

Development Funding and Royalties Agreement with Ligand Pharmaceuticals Incorporated

On May 4, 2019, we entered into the Funding Agreement with Ligand, pursuant to which Ligand provided us funding of $12.0 million, which we used to pursue the development and regulatory approval of SB206, as a treatment for molluscum.

Pursuant to the Funding Agreement, we will pay Ligand up to $20.0 million in milestone payments upon the achievement by us of certain regulatory and commercial milestones associated with SB206 or any product that incorporates or uses NVN1000, the API for our clinical stage product candidates, as a treatment for molluscum. In addition to the milestone payments, we will pay Ligand tiered royalties ranging from 7% to 10% based on annual aggregate net sales of the products in the United States, Mexico or Canada.

See "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements included in this Annual Report for additional information related to the Funding Agreement.

Licensing Arrangements

Expansion of Partnership with Sato in Japanese Territory

On October 5, 2018, we and Sato entered into the second amendment to the initial license agreement dated January 12, 2017, or the Sato Amendment. The initial license agreement had focused on the development and commercialization of SB204 for the treatment of acne vulgaris in Japan. The Sato Amendment also provides Sato with the exclusive rights to develop and commercialize SB206 and related dosage forms for the treatment of viral skin infections, including but not limited to molluscum contagiosum and external genital warts, in Japan. We have received approximately $28.8 million from Sato beginning January 2017 through December 31, 2021 under the Amended Sato Agreement, including (i) a $10.8 million upfront payment received following the execution of the agreement in January 2017; (ii) a $2.2 million payment related to the initiation of a Phase 1 trial in Japan in the third quarter of 2018; (iii) $11.2 million of installment payments received following the execution of the Sato Amendment; and (iv) a $4.6 million payment related to a time-based developmental milestone received in the second quarter of 2021. In addition to the upfront payment paid in three installments in 2018 and 2019 that we received from Sato under the terms of the Sato Amendment, the Sato Amendment also provides for an aggregate of 1.0 billion JPY in additional non-contingent milestone payments that become payable upon the earlier occurrence of specified fixed dates in the future or the achievement of specified milestone events, of which we received 0.5 billion JPY in the second quarter of 2021.

See "Note 4—Licensing Arrangements" and "Note 5—Revenue Recognition" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the Amended Sato Agreement.

Cash Flows

The following table sets forth our cash flows for the periods indicated:

	Year Ended December 31,	
	2021	2020
	(in thousands)	
Net cash (used in) provided by:		
Operating activities	$ (24,777)	$ (31,060)
Investing activities	(7,527)	(126)
Financing activities	44,093	52,814
Net increase in cash, cash equivalents and restricted cash	$ 11,789	$ 21,628

Net Cash Used in Operating Activities

During the year ended December 31, 2021, net cash used in operating activities was $24.8 million and consisted primarily of a net loss of $29.7 million, with adjustments for non-cash amounts related primarily to (i) depreciation expense of $0.3 million, (ii) impairment of long-lived assets of $0.1 million, (iii) a foreign currency transaction loss of $0.8 million related to fair value adjustments for payments received and to be received under the Amended Sato Agreement, (iv) stock-based compensation expense of $0.3 million, (v) a $1.0 million gain on debt extinguishment related to forgiveness of the PPP loan, and (vii) a $4.3 million favorable change in cash related to changes in other operating assets and liabilities. The favorable net change in cash related to changes in assets and liabilities was primarily due to a $1.5 million increase in deferred revenue associated with (i) the recognition of license and collaboration revenue of $2.8 million associated with the Company's performance during the period and (ii) a time-based developmental milestone payment that became due and payable as of December 31, 2021 of $4.3 million, a $0.7 million decrease in prepaid insurance, prepaid expenses and other current assets primarily related to a decrease in certain prepaid service contracts, a $0.3 million increase in accrued legal and professional fees, a $0.5 million increase in accounts payable, a $0.4 million increase in accrued compensation, a $1.4 million increase in other accrued expense, which included a $0.7 million increase related to goods and services associated with the planning, design and build-out of our new facility, and a $0.3 million net change in other long-term assets and liabilities. These increases were partially offset by a $0.7 million decrease in accrued outside research and development services.

During the year ended December 31, 2020, net cash used in operating activities was $31.1 million and consisted primarily of a net loss of $29.3 million, with adjustments for non-cash amounts related primarily to (i) depreciation expense of $1.2 million, (ii) impairment of long-lived assets of $2.3 million, (iii) loss on facility asset group disposition of $0.8 million, (iv) stock-based compensation expense of $1.3 million, (v) fees of $1.7 million related to commitment shares for the June 2020 Aspire CSPA and July 2020 Aspire CSPA, (vi) a loss on disposal of equipment of $0.1 million, and (vii) a $9.1 million net decrease in cash related to changes in other operating assets and liabilities. The net decrease in cash related to changes in assets and liabilities was primarily due to a $0.3 million decrease in deferred revenue, a $2.2 million decrease in research and development service obligation liabilities related to the amortization of the liability in connection with the Funding Agreement with Ligand, a $1.5 million increase in prepaid insurance, prepaid expenses and other current assets primarily related to an increase in prepaid service contracts and insurance, a $0.4 million decrease in accrued legal and professional fees, a $0.4 million decrease in accounts payable, a $0.3 million decrease in other long-term assets and liabilities primarily related to the change in the fair value of our Performance Plan liability, a $4.4 million increase in contracts and grants receivable, and a $0.1 million decrease in accrued outside research and development services. These decreases were partially offset by a $0.7 million increase in accrued compensation. The decrease in deferred revenue and increase in contracts and grants receivable relate to the Amended Sato Agreement and included (i) the recognition of license and collaboration revenue of $4.2 million associated with the Company's performance during the period; (ii) the impact of foreign currency exchange rate fluctuations of approximately $0.9 million; and (iii) a time-based developmental milestone payment that became due and payable as of December 31, 2020 of $4.8 million.

Net Cash Used in Investing Activities

During the year ended December 31, 2021, the $7.5 million of net cash used in investing activities included purchases of property, equipment and services associated with the planning, design and build-out of our new corporate headquarters and small-scale manufacturing facility in Durham, North Carolina, offset by payments received related to the landlord funded tenant improvement allowance. As of December 31, 2021, we also had goods and services associated with the planning, design and build-out of our new facility of $1.5 million included in accounts payable and other accrued expenses in the accompanying balance sheets, which we expect to settle through cash payments during the first half of 2022.

During the year ended December 31, 2020, the $0.1 million of net cash used in investing activities included purchases of property and equipment totaling $0.6 million primarily related to (i) goods and services associated with the planning and design of our new facility in Durham, North Carolina of $0.2 million and (ii) installment payments made to a drug delivery device technology manufacturing vendor in connection with an ongoing drug delivery device technology enhancement project of $0.4 million. These purchases were partially offset by $0.5 million of proceeds from the sale of equipment.

Net Cash Provided by Financing Activities

During the year ended December 31, 2021, net cash provided by financing activities was $44.1 million and consisted primarily of (i) $37.6 million of proceeds from the sale of our common stock pursuant to the June 2021 Public Offering, (ii) $6.3 million of proceeds from the sale of our common stock pursuant to the July 2020 Aspire CSPA, (iii) $0.5 million of proceeds from the exercise of common warrants associated with the March 2020 Public Offering and March 2020 Registered Direct Offering, (iv) $0.1 million of proceeds from the exercise of stock options, partially offset by $0.4 million of payments of costs related to the June 2021 Public Offering.

During the year ended December 31, 2020, net cash provided by financing activities was $52.8 million and consisted primarily of $5.3 million of proceeds, net of underwriting fees, from the closing of our March 2020 Public Offering, $5.5 million of proceeds from the exercise of common warrants associated with the March 2020 Public Offering, $7.3 million of proceeds, net of placement agent fees, from our March 2020 Registered Direct Offering, $1.0 million from the entry into the Note relating to the Loan under the PPP, and $33.9 million of proceeds from the sale of our common stock pursuant to the 2019 Aspire CSPA, the June 2020 Aspire CSPA and the July 2020 Aspire CSPA. These financing cash inflows were partially offset by $0.2 million of other offering costs, including legal and professional fees, directly associated with the March 2020 Public Offering, March 2020 Registered Direct Offering and the February 2020 shelf registration statement filing.

Capital Requirements

As of December 31, 2021, we had a total cash and cash equivalents balance of $47.1 million and positive working capital of $43.0 million. To date, we have not generated any revenue from product sales. We do not know when, or if, we will generate any revenue from product sales. We do not expect to generate revenue from product sales unless, and until, we obtain regulatory approval of one of our current or future product candidates and achieve successful commercialization by a strategic partner or by ourselves. As of December 31, 2021, we had an accumulated deficit of $279.0 million, and there is substantial doubt about our ability to continue as a going concern.

We will need significant additional funding to support our planned and future operating activities and make further advancements in our product development programs beyond what is currently included in our operating forecast and related cash projection. We do not currently have sufficient funds to complete commercialization of any of our product candidates, and our funding needs will largely be determined by our commercialization strategy for SB206, subject to the NDA submission timing and the regulatory approval process and outcome. We are working with Syneos Health to focus on implementing the SB206 prelaunch strategy and commercial preparation, if approved by the FDA.

Our ability to continue to operate our business, including our ability to advance development programs unrelated to SB206, as well as our ability to progress SB206 for molluscum subsequent to an NDA submission, is dependent upon our ability to access additional sources of capital, including, but not limited to (i) equity or debt financings, including through potential sales using the remaining availability under the July 2020 Aspire CSPA; or (ii) non-dilutive sources, such as partnerships, collaborations, licensing, grants or other strategic relationships. There can be no assurance that we will be able to obtain new funding on terms acceptable to us, on a timely basis, or at all. Our inability to obtain significant additional funding on acceptable terms could have a material adverse effect on our business and cause us to alter or reduce our planned operating activities, including but not limited to delaying, reducing, terminating or eliminating planned product candidate development activities, to conserve our cash and cash equivalents. Our anticipated expenditure levels may change if we adjust our current operating plan. Such actions could delay development timelines and have a material adverse effect on our business, results of operations, financial condition and market valuation.

Our equity issuances during the year ended December 31, 2021, and 2020, have resulted in significant dilution to our existing stockholders. Any future additional issuances of equity, or debt that could be convertible into equity, would result in further significant dilution to our existing stockholders.

As of December 31, 2021 we had 18,815,892 shares of common stock outstanding. In addition, as of December 31, 2021, we had reserved 3,065,953 shares of common stock for future issuance related to (i) outstanding warrants to purchase common stock, (ii) outstanding stock options and stock appreciation rights, and (iii) future issuance under the 2016 Incentive Award Plan. Our common stock consists of 200,000,000 authorized shares as of December 31, 2021.

If we are unable to obtain significant additional funding on acceptable terms, including through the utilization of the remaining amount available under the July 2020 Aspire CSPA, it could have a material adverse effect on our business and cause us to alter or reduce our planned operating activities, including but not limited to delaying, reducing, terminating or eliminating planned product candidate development activities, to conserve our cash and cash equivalents. We may pursue additional capital through equity or debt financings, including potential sales under the July 2020 Aspire CSPA, or from non-dilutive sources, including partnerships, collaborations, licensing, grants or other strategic relationships. Our anticipated expenditure levels may change if we adjust our current operating plan. Such actions could delay development timelines and have a material adverse effect on our business, results of operations, financial condition and market valuation.

We are also exploring the potential for strategic transactions, such as strategic acquisitions or in-licenses, sales or divestitures of some of our assets, or other potential strategic transactions, which could include a sale of our business. If we were to pursue such a transaction, we may not be able to complete the transaction on a timely basis or at all or on terms that are favorable to us. Alternatively, if we are unable to obtain significant additional funding on acceptable terms or progress with a strategic transaction, we could instead determine to dissolve and liquidate our assets or seek protection under the bankruptcy laws. If we decide to dissolve and liquidate our assets or to seek protection under the bankruptcy laws, it is unclear to what extent we would be able to pay our obligations, and, accordingly, it is further unclear whether and to what extent any resources would be available for distributions to stockholders.

We have based our projections of operating capital requirements on assumptions that may prove to be incorrect and we may use all of our available capital resources sooner than we expect. Because of the numerous risks and uncertainties associated with research, development and commercialization of pharmaceutical products, we are unable to estimate the exact amount or timing of our operating capital requirements. Our future funding requirements will depend on many factors, including, but not limited to:

- the initiation, progress, timing, costs, results, and evaluation of results of trials for our clinical-stage product candidates, including trials conducted by us or potential future partners;
- the progress, timing, costs and results of development and preclinical study activities relating to other potential applications of our nitric oxide platform;
- the number and characteristics of product candidates that we pursue;
- our ability to enter into strategic relationships and transactions to support the continued development and commercialization of certain product candidates and the success of those arrangements;
- our success in optimizing the size and capability of our new manufacturing facility and related processes to meet our strategic objectives;
- our success in the technical transfer of methods and processes related to our drug substance and drug product manufacturing with our current and/or potential future contract manufacturing partners;
- the outcome, timing and costs of seeking regulatory approvals;
- the occurrence and timing of potential development and regulatory milestones achieved by Sato, our licensee for SB204 and SB206 in Japan;
- the terms and timing of any future collaborations, licensing, consulting, financing or other arrangements that we may enter into;
- the amount and timing of any payments we may be required to make, or that we may receive, in connection with the licensing, filing, prosecution, defense and enforcement of any patents or other intellectual property rights;
- the costs of preparing, filing and prosecuting patent applications, maintaining and protecting our intellectual property rights;
- defending against intellectual property related claims;
- the costs associated with any potential future securities litigation, and the outcome of that litigation;
- the extent to which we in-license or acquire other products and technologies; and
- subject to receipt of marketing approval, revenue received from commercial sales or out licensing of our product candidates.

Contractual Obligations and Contingent Liabilities

Facility Leasing Transactions

In July 2020 we entered into a lease termination agreement, which provided for the early termination of the previously existing lease, as amended, for our former corporate headquarters in Morrisville, North Carolina. In connection with the termination of our lease, we entered into a sublease agreement, which was effective upon the termination of our previous lease agreement, through which we subleased from the new tenant space in the building that was covered by our previous lease. The sublease expired on March 31, 2021. In January 2021 we entered into a new lease agreement, pursuant to which we leased space located in Durham, North Carolina to serve as the Company's new corporate headquarters and support various cGMP activities, as described in the section entitled "Business—Manufacturing and Supplies" in this Annual Report.

See the section entitled "Properties" in this Annual Report and "Note 8—Commitments and Contingencies" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the previous facility lease transaction, including the lease termination and sublease and the new facility lease.

Amended Sato Agreement

Pursuant to the Amended Sato Agreement, we are obligated to supply Sato with all quantities of licensed products required by Sato for their development activities in Japan. As part of the Amended Sato Agreement, we and Sato also agreed to negotiate a commercial supply agreement pursuant to which we or a third-party contract manufacturer would be the exclusive supplier to Sato of the API of licensed products for the commercial manufacture of licensed products in the licensed territory. Additionally, we have agreed to perform certain oversight, review and supporting activities for Sato, including: (i) using commercially reasonable efforts to obtain marketing approval of SB204 and SB206 in the U.S, (ii) sharing all future scientific information we may obtain during the term of the Amended Sato Agreement pertaining to SB204 and SB206, (iii) performing certain additional preclinical studies if such studies are deemed necessary by the Japanese regulatory authority, up to and not to exceed a total cost of $1.0 million, and (iv) participating in a joint committee that oversees, reviews, and approves Sato's development and commercialization activities under the Amended Sato Agreement. Additionally, we have granted Sato the option to use our trademarks in connection with the commercialization of licensed products in the licensed territory for no additional consideration, subject to our approval of such use. We cannot estimate if, when or in what amounts such payments will become due under the Amended Sato Agreement.

The intellectual property rights granted to Sato under the Amended Sato Agreement include certain intellectual property rights which we have licensed from UNC. Under our license agreement with UNC described in "Note 3—Research and Development Licenses" to the accompanying consolidated financial statements included in this Annual Report, we are obligated to pay UNC a running royalty percentage in the low single digits on net sales of licensed products, including net sales that may be generated by Sato. Additionally, we are obligated to make payments to UNC that represent the portion of the Sato upfront and milestone payments that were estimated to be directly attributable to the UNC intellectual property rights included in the license to Sato.

We had also previously entered into an agreement with a third party to assist us in exploring the licensing opportunity which led to the execution of the Sato Agreement. We are obligated to pay the third party a low-single-digit percentage of all upfront and milestone payments the Company receives from Sato under the Amended Sato Agreement.

We have accrued certain fees that we will pay to UNC and a third party in the future upon receipt of non-contingent installment and milestone payments from Sato. As of December 31, 2021, we had recorded capitalized contract acquisition costs of $0.3 million in prepaid expenses and other current assets and other assets and had accrued $0.1 million in the accompanying consolidated balance sheets. For the years ended December 31, 2021 and 2020 we paid fees totaling $0.1 and less than $0.1 million, respectively.

See "Note 5—Revenue Recognition" to the accompanying consolidated financial statements included in this Annual Report for additional information on the Amended Sato Agreement.

Amendments to Sublicense Agreements with KNOW Bio

Pursuant to the terms of the amendments to the KNOW Bio Agreements that we entered into in October 2017, we re-acquired from KNOW Bio exclusive, worldwide rights under certain United States and foreign patents and patent applications controlled by us as of the execution date of the KNOW Bio Agreements, and patents and patent applications which became controlled by us during the three years immediately following the execution date of the KNOW Bio Agreements, directed towards nitric oxide-releasing compositions and methods of manufacturing thereof, including methods of manufacturing Nitricil compounds, and other nitric oxide-based therapeutics, to develop and commercialize products for all diagnostic, therapeutic, prophylactic

and palliative uses for any disease, condition or disorder caused by certain oncoviruses, or the Oncovirus Field. KNOW Bio also granted to us an exclusive license, with the right to sublicense, under any patents and patent applications which became controlled by KNOW Bio during the three years immediately following the execution date of the KNOW Bio Agreements and directed towards nitric oxide-releasing compositions and methods of manufacturing thereof, including methods of manufacturing Nitricil compounds, and other nitric oxide-based therapeutics, but not towards medical devices, to develop and commercialize products for use in the Oncovirus Field. Additionally, KNOW Bio agreed that KNOW Bio would not commercialize any products in the Oncovirus Field during the first three years following the execution date of the KNOW Bio Agreements. The three-year period in which new patents and patent applications are added to the exclusive license and the three-year term of the commercialization non-compete both expired on December 29, 2018.

In addition to the $0.3 million non-refundable upfront payment we made upon execution of the KNOW Bio Amendments, we are obligated to make the following contingent payments in exchange for the rights granted to us in the Oncovirus Field:

For products that incorporate a certain nitric oxide-releasing composition specified in the KNOW Bio Amendments and (i) are covered by KNOW Bio patents or (ii) materially use or incorporate know-how of KNOW Bio or us related to such composition that is created during the three years immediately following the execution date of the KNOW Bio Agreements, or the Covered Products, we must make the following payments to KNOW Bio:

- A milestone payment upon the first time each Covered Product is approved by the FDA for marketing in the Oncovirus Field;
- A royalty in the low single digits on net sales of Covered Products in the Oncovirus Field until the later of the expiration of the KNOW Bio patents covering the applicable Covered Product or the expiration of regulatory exclusivity on the applicable Covered Product; and
- In the event we sublicense the rights to a Covered Product to a third party in the Oncovirus Field, the Company must pay KNOW Bio a low double-digit percentage of any clinical development or NDA approval milestones we receive from the sublicensee for the Covered Product in the Oncovirus Field.

Nitricil is not the nitric oxide-releasing composition specified in the KNOW Bio Amendments as the subject of the foregoing payments. As such, products based on Nitricil are not subject to the foregoing milestone, royalty and sublicensing payment obligations.

The rights granted to us in the Oncovirus Field in the KNOW Bio Amendments continue for so long as there is a valid patent claim under the KNOW Bio Agreements, and upon expiration continue on a perpetual non-exclusive basis, and are subject to the termination rights of KNOW Bio and us that are set forth in the KNOW Bio Agreements. In addition, under the KNOW Bio Amendments, KNOW Bio may terminate the rights granted to the Company in the Oncovirus Field without terminating the Original KNOW Bio Agreements.

See "Note 2—KNOW Bio, LLC" to the accompanying consolidated financial statements included in this Annual Report for additional information on the sublicense agreement with KNOW Bio.

Royalty and Milestone Payments Purchase Agreement with Reedy Creek Investments LLC

In April 2019, we entered into the Purchase Agreement with Reedy Creek pursuant to which Reedy Creek provided us funding and we are obligated to pay Reedy Creek certain ongoing quarterly payments. See the section entitled "Management's Discussion & Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources" in this Annual Report and "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements included in this Annual Report for additional information related to the Purchase Agreement.

Development Funding and Royalties Agreement with Ligand Pharmaceuticals Incorporated

In 2019, we entered into the Funding Agreement with Ligand, pursuant to which Ligand provided us funding and we are obligated to pay Ligand up to $20.0 million in milestone payments. See the section entitled "Management's Discussion & Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources" in this Annual Report and "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements included in this Annual Report for additional information related to the Funding Agreement.

Tangible Stockholder Return Plan, or the Performance Plan

In August 2018, our board of directors approved and established the Performance Plan. We believed that the Performance Plan would help us attract, retain and incentivize the highly qualified resources that were and will be necessary to execute on our

operating strategy. Executive management and the board of directors believe this plan clearly and directly ties long-term employee incentive compensation to specific, significant increases in our underlying common stock price and thus directly aligns employee and stockholder objectives. Unlike our historical practice of providing long-term incentives to our employees through annual stock option grants under the 2016 Plan at the then-current market price of our common stock, the Performance Plan only provides for employees to receive long-term incentive compensation payments if the established stock price targets ($111.70 per share and $254.50 per share, as adjusted) are achieved. The Performance Plan was adjusted on May 25, 2021 as a result of the 1-for-10 Reverse Stock Split, which correspondingly adjusted the two share price goals.

The Performance Plan is tiered, with two separate tranches, each of which has a distinct share price target (measured as the average publicly traded share price of our common stock on the Nasdaq stock exchange for a thirty consecutive trading day period) that will trigger a distinct fixed bonus pool. The share price target for the first tranche is $111.70 per share. The share price target for the second tranche is $254.50 per share. The related contingent bonus pools for the first and second tranches are $25.0 million and $50.0 million, respectively. The compensation committee has discretion to distribute the bonus pool related to each tranche among eligible participants by establishing individual minimum bonus amounts before, as well as by distributing the remainder of the applicable pool after, the achievement of each tranche specific share price target. Otherwise, if we do not achieve one or both related share price targets, as defined, no portion of the bonus pools will be paid.

The Performance Plan provides for the bonus pool to generally be paid in the form of cash. However, the compensation committee has discretion to pay any bonus award under the Performance Plan in the form of cash, shares of our common stock or a combination thereof, provided that our board and stockholders have approved the reservation of such shares of our common stock for such payment. The share price targets will be adjusted in the event of any stock splits, cash dividends, stock dividends, combinations, reorganizations, reclassifications, or similar events. In addition, in the event of a change in control, the plan provides that a bonus pool will become due and payable to participants on a pro rata basis, as calculated and determined by the compensation committee based upon our progress toward the share price target as of the date of the change in control and subject to adjustment by the compensation committee as permitted under the plan.

The Performance Plan was effective immediately upon approval and expires on March 1, 2022, and covers all employees, including our executive officers, consultants and other persons deemed eligible by our compensation committee. The Performance Plan was subsequently amended and restated to reflect minor changes in the timing for establishing minimum bonus amounts.

See "Note 12—Tangible Stockholder Return Plan" to the accompanying consolidated financial statements included in this Annual Report for additional information on the Performance Plan.

Paycheck Protection Program

On April 22, 2020, we entered into the Note for the Loan under the PPP of approximately $1.0 million. The PPP was established under the CARES Act, and is administered by the SBA. The Loan was made through PNC Bank, National Association. Subject to the terms of the Note, the Loan bears interest at a fixed rate of one percent (1%) per annum. Principal and interest on unforgiven amounts are payable monthly commencing on the fifteenth day of the month following the First Payment Date, as defined within the Note. The Note provides that the Loan may be prepaid by the Company at any time prior to the April 22, 2022 maturity date without penalty. We previously applied for and during the second quarter of 2021 received notification of forgiveness of the entire loan balance, including any accrued interest.

For discussion of the Note we entered into for the Loan under the PPP, please refer to the section entitled "Management's Discussion and Analysis—Liquidity and Capital Resources—Paycheck Protection Program" in this Annual Report.

See "Note 9—Paycheck Protection Program" to the accompanying consolidated financial statements included in this Annual Report for additional information on the Loan.

Warrants

In our March 2020 Public Offering, March 2020 Registered Direct Offering, and January 2018 public offering, we issued warrants to purchase shares of our common stock. The warrants provide each warrant holder with the right to require net cash settlement of the warrants upon the occurrence of certain fundamental transactions, provided that such transactions are within our control. For any fundamental transaction that is not within our control, including a fundamental transaction not approved by our board of directors, the warrant holder will only be entitled to receive from us or any successor entity the same type or form of consideration (and in the same proportion) that is being offered and paid to our common stockholders in connection with the fundamental transaction, whether that consideration be in the form of cash, stock or any combination thereof. In the event of any fundamental transaction, and regardless of whether it is within our control, the settlement amount of the warrants (whether

in cash, stock or a combination thereof) is determined based upon a Black-Scholes value that is calculated using inputs as specified in the warrants, including a defined volatility input equal to the greater of our 100-day historical volatility or 100%.

See the section entitled "Management's Discussion and Analysis—Critical Accounting Policies and Use of Estimates—Classification of Warrants and Pre-Funded Warrants Issued in Connection with Offerings of Common Stock" in this Annual Report and "Note 10—Stockholders' Equity (Deficit)" to the accompanying consolidated financial statements included in this Annual Report for additional discussion regarding the terms of the warrants.

Development Services Agreement

We intend to pursue a dual strategy of identifying and designating a partner to become the primary third-party external supplier of our proprietary berdazimer sodium (NVN1000) drug substance to support long-term manufacturing needs, while preparing internal capabilities to support small-scale and short-term manufacturing needs, including manufacture of registration batches to support an SB206 NDA submission and initial commercialization inventory.

In July 2021, we entered into a development services agreement with a third-party full-scale API manufacturer for certain manufacturing process feasibility services including process familiarization, safety assessments, preliminary engineering studies, and initial process and analytical methods determination. Following the successful completion of certain preliminary activities with this third-party API manufacturer and other preparatory activities, we would then plan to proceed with the third-party API manufacturer beyond the initial stages noted above, in which case we would expect to incur substantial costs associated with technical transfer efforts, capital expenditures, manufacturing capabilities, and certain quantities of its drug substance.

Drug Product Manufacturing

We have established a strategic alliance with Orion, a Finnish full-scale pharmaceutical company with broad experience in drug manufacturing. The alliance enables Orion to manufacture our topical nitric oxide-releasing product candidates on our behalf and on the behalf of our global strategic partners. We have executed a master contract manufacturing agreement to enable technology transfer and manufacturing of clinical trial materials for future clinical trials with our topical product candidates.

We enter into various statements of work, under the master contract manufacturing agreement, that govern certain workflows and deliverables, including production of drug product and other manufacturing related services. These statements of work generally provide for termination on notice, and, therefore, we believe that our non-cancelable obligations under these statements of work are not material.

Commercial Preparation

In September 2021, we announced that we engaged Syneos Health, a fully integrated biopharmaceutical solutions organization, as our commercial solutions provider for SB206 as a treatment for molluscum. This relationship with Syneos Health, structured as a fee-for-service arrangement, will focus on implementing the SB206 prelaunch strategy and commercial preparation, if approved by the FDA. The contracts related to Syneos generally provide for termination on notice, and, therefore, we believe that our non-cancelable obligations under these agreements are not material.

Other

We enter into contracts in the normal course of business, including, but not limited to, with clinical research organizations for clinical trials, clinical supply manufacturing, and preclinical research studies, and with manufacturing related vendors for raw materials, production related equipment, drug product and drug substance stability testing, supportive consultative services, and other products and services for operating purposes. These contracts generally provide for termination on notice, and, therefore, we believe that our non-cancelable obligations under these agreements are not material.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined under SEC rules.

Net Operating Loss and Research and Development Tax Credit Carryforwards

As of December 31, 2021, we had federal and state NOLs of approximately $100.0 million and $62.9 million, respectively. The NOLs begin to expire in 2028 and 2023 for federal and state tax purposes, respectively. Certain of our federal net operating losses have an indefinite carryforward. We have research and development tax credits of approximately $1.7 million to offset future federal taxes. These credits begin to expire in 2040.

We record a valuation allowance to offset any net deferred tax assets if, based upon the available evidence, it is more likely than not that we will not recognize some or all of the deferred tax assets. We have had a history of net losses since inception, and, as a result, we have established a 100% valuation allowance of $31.8 million for our net deferred tax assets as of December 31, 2021. If circumstances change and we determine that we will be able to realize some or all of these net deferred tax assets in the future, we will record an adjustment to the valuation allowance.

The Tax Reform Act of 1986 contains provisions which limit the ability to utilize the net operating loss carryforwards and general business credits, including the research and development credit in the case of certain events including significant changes in ownership interests. In accordance with Section 382 of the Code, a change in equity ownership of greater than 50% within a three-year period results in an annual limitation on our ability to utilize our NOL carryforwards created during the tax periods prior to the change in ownership.

During the course of preparing the Company's consolidated financial statements as of and for the year ended December 31 2021, the Company completed an analysis under Sections 382 and 383 of the Code of its historical NOL and tax credit carryforward amounts. If an ownership change, as defined in Section 382, occurs, it results in a Section 382 limitation that applies to all NOLs and tax credits generated prior to the ownership change date that can be used to offset taxable income incurred after the ownership change date. The annual limitation is based on a company's stock value prior to the ownership change, multiplied by the applicable federal long-term, tax-exempt interest rate. As a result, a portion of the prior year net operating loss and tax credit carryforwards were determined to be limited.

See "Note 13—Income Taxes" to the accompanying consolidated financial statements included in this Annual Report for further details. If an additional change in equity ownership occurs in the future which exceeds the Section 382 threshold, our NOL carryforwards and research and development credits may be subject to additional limitations. Since our net operating loss carryforwards are limited, if we have taxable income which exceeds the permissible yearly net operating loss carryforwards, we would incur a federal income tax liability even though net operating loss carryforwards would be available in future years.

Recent Accounting Pronouncements

Recently issued accounting pronouncements that we have adopted or are currently evaluating are described in detail within "Note 1—Organization and Significant Accounting Policies" to the accompanying consolidated financial statements included in this Annual Report.

Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

There were no changes in or disagreements with accountants on accounting and financial disclosures.

Critical Accounting Policies and Use of Estimates

Our management's discussion and analysis of financial condition and results of operations is based on our financial statements, which have been prepared in accordance with U.S. GAAP. The preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported revenue and expenses during the reporting periods. These items are monitored and analyzed by us for changes in facts and circumstances, and material changes in these estimates could occur in the future. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Changes in estimates are reflected in reported results for the period in which they become known. Actual results may differ materially from these estimates under different assumptions or conditions.

While our significant accounting policies are more fully described in the notes to our financial statements included elsewhere in this Annual Report, we believe that the following accounting policies are critical to the process of making significant judgments and estimates in the preparation of our financial statements and understanding and evaluating our reported financial results.

Assessment of Long-Lived Assets for Held-for-Sale Classification and Potential Impairment; Assets and Liabilities Measured at Fair Value on a Non-Recurring Basis

As described in "Note 16—Assets Held for Sale, Impairment Charges" to the accompanying consolidated financial statements included in this Annual Report, we evaluated all of our long-lived assets for potential held for sale classification and potential impairment as of June 29, 2020. This evaluation, which included the conduct of nonrecurring fair value measurements pursuant to FASB ASC 820, *Fair Value Measurements*, required the use of significant judgments and estimates.

The carrying values of long-lived assets within disposal groups that met the criteria to be classified as held for sale were adjusted to equal the disposal groups' fair value less cost to sell. Quoted or estimated selling prices were used to estimate the fair value of the disposal group assets, which were determined to be Level 2 or Level 3 inputs within the fair value measurement hierarchy in ASC 820, respectively.

Long-lived assets in certain asset groups that remained classified as held and used were assessed for potential impairment. For those asset groups that had indicators of impairment and failed a test of recoverability, their carrying value was adjusted to equal their estimated fair value. For the asset group consisting of a right-of-use lease asset, leasehold improvements and other property affixed to the Morrisville, North Carolina, facility, we determined that the lease terms established in the new tenant's prime lease of the Morrisville, North Carolina, facility were representative of the asset group's highest and best use and were consistent with market terms; therefore, such terms were considered to be the best available valuation inputs for the fair value estimate, and such inputs were determined to be Level 3 inputs within the fair value measurement hierarchy. For the asset group consisting of other property and equipment not directly associated with our continuing research, development and pilot scale drug manufacturing capabilities, we determined that a market participant was unlikely to pay any material value for such assets, and, therefore, we determined that their fair value was zero. The inputs used to estimate fair value of this asset group were determined to be Level 3 inputs within the fair value measurement hierarchy. Given the impairment recorded among our long-lived assets, it is reasonably possible that changes in judgments and assumptions we used to estimate the fair value of such assets or other circumstances, including changes in our intended use of such assets, could cause us to consider some portion or all of the remaining long-lived assets to become impaired.

Leases

We lease office space and certain equipment under non-cancelable lease agreements. We assess all arrangements, that convey the right to control the use of property, plant and equipment, at inception, to determine if it is, or contains, a lease based on the unique facts and circumstances present in that arrangement. For those leases identified, we determine the lease classification, recognition, and measurement at the lease commencement date. For arrangements that contain a lease we: (i) identify lease and non-lease components; (ii) determine the consideration in the contract; (iii) determine whether the lease is an operating or financing lease; and (iv) recognize lease Right of Use, or ROU, assets and corresponding lease liabilities. Lease liabilities are recorded based on the present value of lease payments over the expected lease term. The corresponding ROU asset is measured from the initial lease liability, adjusted by (i) accrued or prepaid rents; (ii) remaining unamortized initial direct costs and lease incentives; and (iii) any impairments of the ROU asset. The interest rate implicit in our lease contracts is typically not readily determinable and as such, we use our incremental borrowing rate based on the information available at the lease commencement date, which represents an internally developed rate that would be incurred to borrow, on a collateralized basis, over a similar term, an amount equal to the lease payments in a similar economic environment.

See "Note 1—Organization and Significant Accounting Policies" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding our accounting policies for our lease agreements.

Revenue Recognition

Beginning in 2017, we began to generate revenue from (i) non-refundable upfront fees, milestone payments and royalties earned under license agreements and (ii) providing research and development services.

See "Note 1—Organization and Significant Accounting Policies" and "Note 5—Revenue Recognition" to the accompanying consolidated financial statements included in this Annual Report for further information and accounting considerations related to revenue recognition, including revenue recognition pertaining to licensing arrangements.

Licensing Arrangements

We entered into the Sato Agreement in the first quarter of 2017, and the Sato Amendment in October 2018, and may enter into additional licensing arrangements in the future, in exchange for non-refundable upfront payments and potential future milestone and royalty payments.

If the license of our Company's intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, we recognize revenues from non-refundable, upfront fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. For licenses that are bundled with other promises, we utilize judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the estimated performance period and the appropriate method of measuring progress during the performance period for purposes of recognizing revenue. We re-evaluate the estimated performance period and measure of progress each reporting period and, if necessary, adjust related revenue recognition accordingly.

At the inception of each arrangement that includes development milestone payments, we evaluate whether the milestones are considered probable of being reached and estimate the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. The transaction price is then allocated to each performance obligation on a relative stand-alone selling price basis, for which we recognize revenue as or when the performance obligations under the contract are satisfied. At the end of each subsequent reporting period, we re-evaluate the probability of achievement of such development milestones and any related constraint, and if necessary, adjust our estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect license and collaboration revenue and earnings in the period of adjustment.

Amounts received prior to satisfying all revenue recognition criteria are recorded as deferred revenue in the accompanying balance sheets.

Specifically related to the Sato Agreement, as amended, we recognize revenue using a time-based input method that results in straight-line recognition over the Company's performance period. We monitor and reassess the estimated performance period for purposes of revenue recognition during each reporting period. Therefore, if the duration of the combined SB204 and SB206 development program timeline is affected by the establishment or subsequent adjustments to a mutually agreed upon SB204 and SB206 development plan in the Japan territory, we will adjust its estimated performance period for revenue recognition purposes accordingly, as needed. For further information regarding such timeline, see "Note 5—Revenue Recognition" to the accompanying consolidated financial statements included in this Annual Report.

Government research contracts and grants revenue.

Under the terms of the contracts and grants awarded, we are entitled to receive reimbursement of our allowable direct expenses, allocated overhead, general and administrative expenses and payment of other specified amounts. Revenues from development and support activities under government research contracts and grants are recorded in the period in which the related costs are incurred. Associated expenses are recognized when incurred as research and development expense. Revenue recognized in excess of amounts collected are recorded as contracts and grants receivable. Any of the funding sources may, at their discretion, request reimbursement for expenses or return of funds, or both, as a result of noncompliance by us with the terms of the grants. No reimbursement of expenses or return of funds has been requested or made since inception of the contracts and grants. See "Note 5—Revenue Recognition" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding government grants.

Research and Development Expenses

Accrued Expenses

As part of the process of preparing financial statements, we are required to estimate accrued expenses. This process involves reviewing open contracts and purchase orders, communicating with applicable vendor personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of actual cost. The majority of our service providers invoice us monthly in arrears for services performed. We make estimates of our accrued expenses as of each balance sheet date in our financial statements based on facts and circumstances known to us. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. Examples of estimated accrued expenses include fees incurred by CROs in connection with clinical trials, fees paid to investigative sites in connection with clinical trials, professional service fees and unpaid salaries, wages and benefits.

We accrue our expenses related to clinical trials based on our estimates of the services received and efforts expended pursuant to contracts with multiple research institutions and CROs that conduct and manage clinical trials on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. Payments under some of these contracts depend on factors such as the successful enrollment of patients and the completion of clinical trial milestones. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we will adjust the accrual accordingly. If we do not identify costs that we have begun to incur or if we underestimate or overestimate the level of services performed or the costs of these services, our actual expenses could differ from our estimates. We do not anticipate the future settlement of existing accruals to differ materially from our estimates.

Reedy Creek Purchase Agreement

We have determined that the Purchase Agreement with Reedy Creek is within the scope of ASC 730-20, *Research and Development Arrangements*. We concluded that there has not been a substantive and genuine transfer of risk related to the Purchase Agreement as (i) Reedy Creek has the opportunity to recover its investment regardless of the outcome of the research and development programs within the scope of the agreement (prior to commercialization of any in scope assets through potential out-licensing agreements and related potential future milestone payments); and (ii) there is a presumption that we are obligated to pay Reedy Creek amounts equal to its investment based on the related party relationship at the time the parties entered into the Purchase Agreement. The Purchase Agreement is a broad funding arrangement, due to (i) the multi-asset, or portfolio approach including three developmental assets that are within the scope of the arrangement; and (ii) Reedy Creek's approximate 5% ownership of our outstanding shares of common stock at the time of entry into the Purchase Agreement.

As such, we have determined that the appropriate accounting treatment under ASC 730-20 was to record the initial proceeds of $25.0 million as cash and cash equivalents, as we had the ability to direct the usage of funds, and a long-term liability within our classified balance sheet. The long-term liability will remain until we receive future milestones from other potential third parties, as defined within the Purchase Agreement, of which 25% will be contractually owed to Reedy Creek. If potential future milestones are received by us, and become partly due to Reedy Creek, the corresponding partial repayment to Reedy Creek will result in a ratable reduction of the total long-term obligation to repay the initial purchase price.

See "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements included in this Annual Report for additional discussion regarding the applicable accounting treatment of the Purchase Agreement.

Ligand Funding Agreement

We have determined that the Ligand transaction is within the scope of ASC 730-20 as it represents an obligation to perform contractual services for the development of SB206 using commercially reasonable efforts. In addition, the Funding Agreement also states that if all development of SB206 is ceased prior to the first regulatory approval, we must pay to Ligand an amount equal to the purchase price less the amount spent in accordance with the development budget on development activities conducted prior to such cessation. As such, we concluded that the appropriate accounting treatment under ASC 730-20 was to record the initial proceeds of $12.0 million, as a liability and as restricted cash on our consolidated balance sheet, as the funds could only be used for the progression of SB206.

We amortize the liability ratably during each reporting period, based on the Ligand funding as a percentage of the total direct costs we incur during the reporting period related to the estimated total cost to progress the SB206 program to a regulatory approval in the United States. The ratable Ligand funding has been presented within our accompanying consolidated statements of operations and comprehensive loss as an offset to research and development expenses associated with the SB206 program.

However, because the aggregate amount spent in accordance with the SB206 development budget on SB206 development activities had exceeded the $12.0 million purchase price, we reported no restricted cash balance related to the Funding Agreement, as of December 31, 2021 in our consolidated balance sheet.

See "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements included in this Annual Report for additional discussion regarding the applicable accounting treatment of the Funding Agreement.

Classification of Warrants and Pre-Funded Warrants Issued in Connection with Offerings of Common Stock

Warrants

In our March 2020 Public Offering, March 2020 Registered Direct Offering, and January 2018 public offering we issued warrants to purchase shares of our common stock. The warrants provide each warrant holder with the right to require net cash settlement of the warrants upon the occurrence of certain fundamental transactions, provided that such transactions are within

our control. For any fundamental transaction that is not within our control, including a fundamental transaction not approved by our board of directors, the warrant holder will only be entitled to receive from us or any successor entity the same type or form of consideration (and in the same proportion) that is being offered and paid to our common stockholders in connection with the fundamental transaction, whether that consideration be in the form of cash, stock or any combination thereof. In the event of any fundamental transaction, and regardless of whether it is within our control, the settlement amount of the warrants (whether in cash, stock or a combination thereof) is determined based upon a Black-Scholes value that is calculated using inputs as specified in the warrants, including a defined volatility input equal to the greater of our 100-day historical volatility or 100%.

We assessed the warrants for appropriate equity or liability classification pursuant to our accounting policy described in "Note 1—Organization and Significant Accounting Policies" to the accompanying consolidated financial statements included in this Annual Report. During this assessment, we determined that (i) the warrants did not constitute a liability under ASC 480; (ii) the warrants met the definition of a derivative under ASC 815; (iii) the warrant holder's option to receive a net cash settlement payment only becomes exercisable upon the occurrence of certain specified fundamental transactions that are within our control; (iv) upon the occurrence of a fundamental transaction that is not within our control, the warrant holder would receive the same type or form of consideration offered and paid to common stockholders; (v) the warrants are indexed to our common stock; and (vi) the warrants met all other conditions for equity classification under ASC 480 and ASC 815. Based on the results of this assessment, we concluded that the warrants were freestanding equity-linked derivative instruments that met the criteria for the own-equity scope exception to derivative accounting under ASC 815. Accordingly, the warrants were classified as equity and were accounted for as a component of additional paid-in capital at the time of issuance.

See "Note 10—Stockholders' Equity (Deficit)" to the accompanying consolidated financial statements included in this Annual Report for additional discussion regarding the terms of the warrants and the applicable accounting treatment.

Pre-Funded Warrants

In the March 2020 Public Offering and March 2020 Registered Direct Offering, we also issued pre-funded warrants to purchase shares of our common stock. The pre-funded warrants did not provide each warrant holder with the option to settle any unexercised warrants for cash in the event of any fundamental transactions. In all fundamental transaction scenarios, the warrant holder was only entitled to receive from us or any successor entity the same type or form of consideration (and in the same proportion) that was being offered and paid to our stockholders in connection with the fundamental transaction, whether that consideration be in the form of cash, stock or any combination thereof. The pre-funded warrants also included a separate provision whereby the exercisability of the warrants was limited if, upon exercise, the warrant holder or any of its affiliates would have beneficially owned more than 4.99% (or an amount up to 9.99% if the holder so elects) of our common stock.

We assessed the pre-funded warrants for appropriate equity or liability classification pursuant to our accounting policy described in "Note 1—Organization and Significant Accounting Policies" to the accompanying consolidated financial statements included in this Annual Report. During this assessment, we determined the pre-funded warrants were freestanding instruments that did not meet the definition of a liability pursuant to ASC 480 and did not meet the definition of a derivative pursuant to ASC 815. The pre-funded warrants were indexed to our common stock and met all other conditions for equity classification under ASC 480 and ASC 815. Based on the results of this assessment, we concluded that the pre-funded warrants were freestanding equity-linked financial instruments that met the criteria for equity classification under ASC 480 and ASC 815. Accordingly, the pre-funded warrants were classified as equity and were accounted for as a component of additional paid-in capital at the time of issuance.

See "Note 10—Stockholders' Equity (Deficit)" to the accompanying consolidated financial statements included in this Annual Report for additional discussion regarding the terms of the pre-funded warrants and the applicable accounting treatment.

Stock-Based Compensation

Determination of the Fair Value of Stock-based Compensation Grants

We record the fair value of stock options, and other stock-based compensation issued to employees and non-employees as of the grant date as stock-based compensation expense. We typically recognize compensation expense over the requisite service period, which is typically the vesting period.

We estimate the fair value of our stock-based awards to employees and non-employees using the Black-Scholes option-pricing model, which requires the input of assumptions, some of which are highly subjective, including (i) the fair value of our common stock on the date of grant, (ii) the expected volatility of our stock, (iii) the expected term of the award, (iv) the risk-free interest rate and (v) expected dividends. In applying these assumptions, we considered the following factors:

- Due to the lack of company-specific historical and implied volatility data, we have based our estimate of expected volatility on the historical volatility of a group of similar companies that are publicly traded. We also considered characteristics such as industry, stage of life cycle, financial leverage, enterprise value, risk profiles and position within the industry, along with historical share price information sufficient to meet the expected life of the stock-based awards. We compute the historical volatility data using the daily closing prices for the selected companies' shares during the equivalent period of the calculated expected term of our stock-based awards. We will continue to apply this process until a sufficient amount of historical information regarding the volatility of our own stock price becomes available.
- We have estimated the expected term of our employee stock options using the "simplified" method, whereby, the expected life equals the average of the vesting term and the original contractual term of the option.
- The risk-free interest rate is based on the yields of United States Treasury securities with maturities similar to the expected term of granted stock-based awards.
- We have never declared or paid any cash dividends to common stockholders and do not presently plan to pay cash dividends in the foreseeable future. Consequently, we use an expected dividend yield of zero.

See "Note 11—Stock-Based Compensation" to the accompanying consolidated financial statements included in this Annual Report for additional detail including the weighted average assumptions used in the Black-Scholes option-pricing model for awards granted in the years ended December 31, 2021 and 2020.

We are also required to estimate forfeitures at the time of grant, and to revise those estimates in subsequent periods if actual forfeitures differ from estimates. We use historical data to estimate pre-vesting option forfeitures and record stock-based compensation expense only for those awards that are expected to vest. To the extent that actual forfeitures differ from our estimates, the difference is recorded as a cumulative adjustment in the period the estimates were revised. Stock-based compensation expense recognized in the financial statements is based on awards that are ultimately expected to vest.

Tangible Stockholder Return Plan, or Performance Plan

On August 2, 2018, our board of directors approved and established the Tangible Stockholder Return Plan, which is a performance-based long-term incentive plan. The Performance Plan was effective immediately upon approval and expires on March 1, 2022. The Performance Plan is tiered, with two separate tranches, each of which has a distinct share price target (measured as the average publicly traded share price of our common stock on the Nasdaq stock exchange for a 30 consecutive trading day period) that will, if achieved, trigger a distinct fixed bonus pool. As adjusted for the Reverse Stock Split, the share price target for the first tranche and related bonus pool are $111.70 per share and $25.0 million, respectively. As adjusted for the Reverse Stock Split, the share price target for the second tranche and related bonus pool are $254.50 per share and $50.0 million, respectively.

We have concluded that the Performance Plan is within the scope of ASC Topic 718, *Compensation—Stock Compensation* as the underlying plan obligations are based on the potential attainment of certain market share price targets of our common stock. Any awards under the Performance Plan would be payable, at the discretion of our compensation committee following the achievement of the applicable share price target, in cash, shares of our common stock, or a combination thereof, provided that, prior to any payment in common stock, our stockholders have approved the reservation of shares of our common stock for such payment.

ASC 718 requires that a liability-based award should be classified as a liability on our consolidated balance sheets and the amount of compensation cost recognized should be based on the fair value of the liability. When a liability-based award includes both a service and market condition, the market condition is taken into account when determining the appropriate method to estimate fair value and the compensation cost is amortized over the estimated service period. Therefore, the liability associated with the Performance Plan obligation is recorded within other long-term liabilities on the accompanying consolidated balance sheets included in this Annual Report at the estimated fair value on the date of issuance and is re-valued each subsequent reporting period end with adjustments to the fair value recognized as stock-based compensation expense within operating expenses in the accompanying consolidated statements of operations included in this Annual Report.

The fair value of obligations under the Performance Plan are estimated using a Monte Carlo simulation approach. Our common stock price is simulated under the Geometric Brownian Motion framework under each simulation path. The other assumptions for the Monte Carlo simulation include the risk-free interest rate, estimated volatility and the expected term. Expected stock price volatility is based on our actual historical volatility over a historical period equal to the expected remaining life of the plan, adjusted for certain market considerations and other factors. The fair value of the underlying common stock is the published closing market price by Nasdaq as of each reporting date, as adjusted for significant events, as necessary. The risk-

free interest rate is based on the United States Treasury yield curve in effect on the date of valuation equal to the remaining expected life of the plan. The dividend yield percentage is zero because we do not currently pay dividends, nor do we intend to do so during the expected term of the plan. The expected life of bonus awards under the Performance Plan is assumed to be equivalent to the remaining contractual term based on the estimated service period including the service inception date of the plan participants and the contractual end of the Performance Plan.

Our estimates underlying the assumptions used in the Monte Carlo simulation valuation model are subject to risks and uncertainties and may change over time. Such changes could have a significant effect on our reported net losses in future periods.

See "Note 12—Tangible Stockholder Return Plan" to the accompanying consolidated financial statements included in this Annual Report for the significant assumptions used in estimating the fair value of the Performance Plan and see "Note 1—Organization and Significant Accounting Policies" to the accompanying consolidated financial statements included in this Annual Report for our accounting policy pertaining to the fair value of financial instruments.

Stock Appreciation Rights

SARs that include cash settlement features are accounted for as liability-based awards pursuant to ASC 718 *Compensation—Stock Compensation*. The fair value of such SARs is estimated using a Black-Scholes option-pricing model on each financial reporting date using expected volatility, risk-free interest rate, expected life and fair value per share assumptions.

The fair value of each liability award is estimated with a valuation model that uses certain assumptions, such as the award date, expected volatility, risk-free interest rate, expected life of the award and fair value per share assumptions. Due to limited historical data, we estimate stock price volatility based on the actual volatility of comparable publicly traded companies over the expected term. In evaluating similarity, we considered factors such as industry, stage of life cycle, financial leverage, size and risk profile. The expected term for liability-based awards is the estimated contractual life. The risk-free rate is based on the United States Treasury yield curve during the expected life of the award.

See "Note 11—Stock-Based Compensation" to the accompanying consolidated financial statements included in this Annual Report for the significant assumptions used in estimating the fair value of SARs.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Not applicable.

Item 8. Financial Statements and Supplementary Data.

NOVAN, INC.
INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

Stockholders and Board of Directors
Novan, Inc.
Durham, North Carolina

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Novan, Inc. (the "Company") as of December 31, 2021 and 2020, the related consolidated statements of operations and comprehensive loss, stockholders' equity (deficit), and cash flows for the years then ended, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2021 and 2020, and the results of its operations and its cash flows for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

Going Concern Uncertainty

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 not generated significant revenue or positive cash flows from operations. These factors raise substantial doubt about the Company's 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 the Company's 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.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of a critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Sato License Agreement Development Period

As described in Notes 4 and 5 to the Company's consolidated financial statements, the Company has entered into a license agreement with Sato Pharmaceutical Co., Ltd. ("Sato"), as amended, which granted Sato the right and license to develop, use

and sell products in Japan that incorporate certain of the Company's intellectual property rights. Revenue under the license agreement is recognized over Sato's estimated development period in Japan. Each reporting period, the Company reassesses the estimated development period for the license agreement for purposes of revenue recognition.

We have identified management's estimate of the development period for the Sato license agreement as a critical audit matter. Determination of the development period requires management to estimate the progress of Sato's advancement of drug candidates incorporating certain of the Company's intellectual property rights through Japanese clinical trials. Auditing management's estimates with respect to the development period required increased auditor judgment due to the inherent uncertainty involved in the clinical development process.

The primary procedures we performed to address this critical audit matter included:

- Confirming management's current estimate of the development period with Sato professionals involved in the development of the drug candidates incorporating the Company's licensed intellectual property.
- Assessing management's estimate of the development period through discussions with the Company's clinical development professionals knowledgeable about the current progression of the drug candidates incorporating the Company's intellectual property through the approval process in Japan.
- Remaining alert for information contradictory to management's estimate of the development period to determine the completeness of considerations made by management.
- Reviewing meeting minutes and development timelines from the joint development committee as well as communications with manufacturing parties and clinical research organizations for consistency with management's estimate of the development period.

/s/ BDO USA, LLP

We have served as the Company's auditor since 2018.

Raleigh, North Carolina
February 18, 2022

NOVAN, INC.
Consolidated Balance Sheets
(in thousands, except share and per share amounts)

	Year Ended December 31,	
	2021	**2020**
ASSETS		
Current assets:		
Cash and cash equivalents	$ 47,085	$ 35,879
Contracts and grants receivable	4,473	4,863
Prepaid insurance	1,697	1,818
Prepaid expenses and other current assets	766	1,333
Other current asset related to leasing arrangement, net	109	—
Assets held for sale	—	114
Total current assets	54,130	44,007
Restricted cash	583	—
Intangible assets	75	75
Other assets	278	341
Property and equipment, net	12,201	2,406
Right-of-use lease assets	1,693	—
Total assets	$ 68,960	$ 46,829
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 2,170	$ 1,192
Accrued compensation	1,543	1,154
Accrued outside research and development services	194	930
Accrued legal and professional fees	427	168
Other accrued expenses	2,824	801
Deferred revenue, current portion	2,586	2,990
Paycheck Protection Program loan, current portion	—	478
Research and development service obligation liability, current portion	1,406	987
Total current liabilities	11,150	8,700
Deferred revenue, net of current portion	10,665	8,238
Paycheck Protection Program loan, net of current portion	—	478
Operating lease liabilities, net of current portion	3,613	—
Research and development service obligation liability, net of current portion	142	649
Research and development funding arrangement liability	25,000	25,000
Other long-term liabilities	71	787
Total liabilities	50,641	43,852
Commitments and contingencies (Note 8)		
Stockholders' equity		
Common stock $0.0001 par value; 200,000,000 shares authorized as of December 31, 2021 and 2020; 18,816,842 and 14,570,959 shares issued as of December 31, 2021 and 2020, respectively; 18,815,892 and 14,570,009 shares outstanding as of December 31, 2021 and 2020, respectively	2	1
Additional paid-in-capital	297,441	252,408
Treasury stock at cost, 950 shares as of December 31, 2021 and 2020	(155)	(155)
Accumulated deficit	(278,969)	(249,277)
Total stockholders' equity	18,319	2,977
Total liabilities and stockholders' equity	$ 68,960	$ 46,829

The accompanying notes are an integral part of these consolidated financial statements

NOVAN, INC.
Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except share and per share amounts)

	Year Ended December 31,	
	2021	**2020**
License and collaboration revenue	$ 2,822	$ 4,208
Government research contracts and grants revenue	136	712
Total revenue	2,958	4,920
Operating expenses:		
Research and development	20,416	19,814
General and administrative	12,343	11,271
Impairment loss on long-lived assets	114	2,277
Loss on facility asset group disposition	—	1,772
Total operating expenses	32,873	35,134
Operating loss	(29,915)	(30,214)
Other (expense) income, net:		
Interest income	13	51
Gain on debt extinguishment	956	—
Other (expense) income	(746)	870
Total other (expense) income, net	223	921
Net loss and comprehensive loss	$ (29,692)	$ (29,293)
Net loss per share, basic and diluted	$ (1.74)	$ (2.96)
Weighted-average common shares outstanding, basic and diluted	17,065,932	9,880,812

The accompanying notes are an integral part of these consolidated financial statements

NOVAN, INC.
Consolidated Statements of Stockholders' Equity (Deficit)
(in thousands, except share amounts)

	Common Stock		Additional Paid-In Capital	Treasury Stock	Accumulated Deficit	Total
	Shares	Amount				
Balance as of December 31, 2019	2,673,480	$ —	$ 197,856	$ (155)	$ (219,984)	$ (22,283)
Stock-based compensation	—	—	991	—	—	991
Common stock and pre-funded warrants issued pursuant to public offering, net	1,549,860	—	5,158	—	—	5,158
Exercise of pre-funded warrants related to public offering	433,333	—	—	—	—	—
Common stock and pre-funded warrants issued pursuant to registered direct offering, net	1,055,000	1	7,224	—	—	7,225
Exercise of pre-funded warrants related to registered direct offering	805,465	—	—	—	—	—
Exercise of common stock warrants	1,845,917	—	5,538	—	—	5,538
Common stock issued pursuant to common stock purchase agreements	6,205,804	—	35,636	—	—	35,636
Exercise of stock options	1,150	—	5	—	—	5
Net loss	—	—	—	—	(29,293)	(29,293)
Balance as of December 31, 2020	14,570,009	$ 1	$ 252,408	$ (155)	$ (249,277)	$ 2,977
Stock-based compensation	—	—	941	—	—	941
Extinguishment of fractional shares resulting from reverse stock split	(37)	—	—	—	—	—
Common stock issued pursuant to public offering, net	3,636,364	—	37,236	—	—	37,236
Exercise of common stock warrants	103,551	—	461	—	—	461
Common stock issued pursuant to common stock purchase agreements	493,163	1	6,333	—	—	6,334
Exercise of stock options	12,842	—	62	—	—	62
Net loss	—	—	—	—	(29,692)	(29,692)
Balance as of December 31, 2021	18,815,892	$ 2	$ 297,441	$ (155)	$ (278,969)	$ 18,319

The accompanying notes are an integral part of these consolidated financial statements

NOVAN, INC.
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31,	
	2021	2020
Cash flow from operating activities:		
Net loss	$ (29,692)	$ (29,293)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	344	1,170
Impairment loss on long-lived assets	114	2,277
Non-cash loss on facility asset group disposition	—	767
Stock-based compensation	275	1,308
Non-cash cost of shares issued to Aspire Capital as commitment fee	—	1,695
Foreign currency transaction loss	820	—
Gain on debt extinguishment	(956)	—
Loss on disposal and write-offs of property and equipment	—	66
Changes in operating assets and liabilities:		
Contracts and grants receivable	47	(4,444)
Prepaid insurance, prepaid expenses and other current assets	688	(1,548)
Accounts payable	544	(427)
Accrued compensation	389	717
Accrued outside research and development services	(736)	(83)
Accrued legal and professional fees	259	(448)
Other accrued expenses	1,377	(38)
Deferred revenue	1,525	(276)
Research and development service obligation liability	(88)	(2,179)
Other long-term assets and liabilities	313	(324)
Net cash used in operating activities	(24,777)	(31,060)
Cash flow from investing activities:		
Purchases of property and equipment	(9,050)	(648)
Landlord reimbursement of tenant improvement allowance	1,523	—
Proceeds from the sale of property and equipment	—	522
Net cash used in investing activities	(7,527)	(126)
Cash flow from financing activities:		
Proceeds from issuance of common stock and pre-funded warrants, net of underwriting fees and commissions	37,600	12,577
Proceeds from exercise of common stock warrants	461	5,538
Proceeds from Paycheck Protection Program loan	—	956
Proceeds from issuance of common stock under common stock purchase agreement	6,334	33,941
Payments related to public offering costs	(364)	(178)
Payments of offering costs related to new registration statement	—	(25)
Proceeds from exercise of stock options	62	5
Net cash provided by financing activities	44,093	52,814
Net increase in cash, cash equivalents and restricted cash	11,789	21,628
Cash, cash equivalents and restricted cash as of beginning of period	35,879	14,251
Cash, cash equivalents and restricted cash as of end of period	$ 47,668	$ 35,879
Supplemental disclosure of cash flow information:		
Cash paid for interest	$ —	$ —
Supplemental disclosure of non-cash investing and financing activities:		
Deferred offering costs reclassified to additional paid-in capital	$ 364	$ 16
Purchases of property and equipment with accounts payable and accrued expenses	$ 1,471	$ 382
Right-of-use assets obtained in exchange for lease liabilities	$ 1,693	$ —
Non-cash gain on debt extinguishment from forgiveness of Paycheck Protection Program loan	$ 956	$ —
Reconciliation to consolidated balance sheets:		
Cash and cash equivalents	$ 47,085	$ 35,879
Restricted cash	583	—
Total cash, cash equivalents and restricted cash shown in the statement of cash flows	$ 47,668	$ 35,879

The accompanying notes are an integral part of these consolidated financial statements

Note 1: Organization and Significant Accounting Policies

Business Description and Basis of Presentation

Novan, Inc. ("Novan" and together with its subsidiaries, the "Company"), is a North Carolina-based pre-commercial nitric oxide-based pharmaceutical company focused on dermatology and anti-infective therapies. The Company leverages its proprietary nitric oxide based technology platform, Nitricil™, to generate macromolecular new chemical entities. Novan was incorporated in January 2006 under the state laws of Delaware. Its wholly-owned subsidiary, Novan Therapeutics, LLC was organized in 2015 under the state laws of North Carolina. On March 14, 2019, the Company completed registration of a wholly-owned Ireland-based subsidiary, Novan Therapeutics, Limited.

The accompanying consolidated financial statements of the Company have been prepared in accordance with generally accepted accounting principles in the United States of America ("U.S. GAAP"). Additionally, the report of the Company's independent registered public accounting firm (PCAOB ID #243) on the Company's consolidated financial statements as of and for the year ended December 31, 2021, included an explanatory paragraph indicating that there is substantial doubt about the Company's ability to continue as a going concern, as further discussed below.

Basis of Consolidation

The accompanying consolidated financial statements reflect the operations of the Company and its wholly owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

Reverse Stock Split

On May 25, 2021, the Company amended its restated certificate of incorporation effecting a 1-for-10 reverse stock split of its outstanding shares of capital stock (the "Reverse Stock Split"). The Reverse Stock Split did not change the number of authorized shares of capital stock of the Company or cause an adjustment to the par value of the Company's capital stock. As a result of the Reverse Stock Split, the Company adjusted (i) the per share exercise price and the number of shares issuable upon the exercise of all outstanding stock options, warrants to purchase shares of common stock and stock appreciation rights, (ii) the share price targets of the Company's Tangible Stockholder Return Plan and (iii) the number of shares reserved for issuance pursuant to the Company's equity incentive compensation plans. No fractional shares were issued in connection with the Reverse Stock Split. Stockholders who would have otherwise held a fractional share of capital stock received a cash payment for any fractional share resulting from the Reverse Stock Split in an amount equal to such fraction multiplied by the closing sales price of the common stock as reported on the Nasdaq Stock Market on May 25, 2021, the last trading day immediately prior to the effectiveness of the Reverse Stock Split. See Note 10—Stockholders' Equity (Deficit) for further information regarding the Reverse Stock Split.

All disclosures of shares and per share data in the consolidated financial statements and related notes have been retroactively adjusted to reflect the Reverse Stock Split for all periods presented, and certain amounts within the consolidated balance sheets and consolidated statements of stockholders' equity (deficit) were reclassified between common stock and additional paid-in capital.

Liquidity and Ability to Continue as a Going Concern

The Company's consolidated financial statements have been prepared assuming that the Company will continue as a going concern, which contemplates the realization of assets and the settlement of liabilities and commitments in the normal course of business. The accompanying consolidated financial statements do not include any adjustments to reflect the possible future effects on the recoverability and classification of assets or the amounts and classification of liabilities that may result from uncertainty related to the Company's ability to continue as a going concern.

The Company has evaluated principal conditions and events, in the aggregate, that may raise substantial doubt about its ability to continue as a going concern within one year from the date that these financial statements are issued. The Company identified the following conditions:

- The Company has reported a net loss in all fiscal periods since inception and, as of December 31, 2021, the Company had an accumulated deficit of $278,969.
- As of December 31, 2021, the Company had a total cash and cash equivalents balance of $47,085.

- As described in Note 10—Stockholders' Equity (Deficit), in June 2021 the Company completed a public offering of its common stock pursuant to the Company's shelf registration statement (the "June 2021 Public Offering"). Net proceeds from the offering were approximately $37,236 after deducting underwriting discounts and commissions and offering expenses of approximately $2,764.

- As described in Note 10—Stockholders' Equity (Deficit), in July 2020 the Company entered into a common stock purchase agreement (the "July 2020 Aspire CSPA") with Aspire Capital Fund, LLC ("Aspire Capital"). The July 2020 Aspire CSPA replaced the prior common stock purchase agreement, dated as of June 15, 2020, between the Company and Aspire Capital (the "June 2020 Aspire CSPA"), which was fully utilized. During the year ended December 31, 2021, the Company received aggregate net proceeds of $6,334 from sales under the July 2020 Aspire CSPA and, as of December 31, 2021, had $12,005 in remaining availability for sales of its common stock under the July 2020 Aspire CSPA, subject to certain limitations.

- The Company anticipates that it will continue to generate losses for the foreseeable future, and it expects the losses to increase as it continues the development of, and seeks regulatory approvals for, its product candidates and begins activities to prepare for potential commercialization.

- The Company has concluded that the prevailing conditions and ongoing liquidity risks faced by the Company, coupled with its current forecasts, including costs associated with implementing the SB206 prelaunch strategy and commercial preparation, raise substantial doubt about its ability to continue as a going concern.

This evaluation is also based on other relevant conditions that are known or reasonably knowable at the date that the financial statements are issued, including ongoing liquidity risks faced by the Company, the Company's conditional and unconditional obligations due or anticipated within one year, the funds necessary to maintain the Company's operations considering its current financial condition, obligations, and other expected cash flows, and other conditions and events that, when considered in conjunction with the above, may adversely affect the Company's ability to meet its obligations. The Company will continue to evaluate this going concern assessment in connection with the preparation of its quarterly and annual financial statements based upon relevant facts and circumstances, including but not limited to, its cash and cash equivalents balance and its operating forecast and related cash projection.

Based on the Company's operating forecast, it believes that its existing cash and cash equivalents balance as of December 31, 2021, plus expected contractual payments to be received in connection with existing licensing agreements, will not provide it with adequate liquidity for one year from the date of the issuance of the consolidated financial statements. This operating forecast and related cash projection includes: (i) costs associated with preparing for and seeking U.S. regulatory approval of SB206 as a treatment for molluscum, including costs to prepare for a pre-NDA meeting with the FDA and NDA-enabling drug stability studies for SB206; (ii) costs associated with the completion and readiness of its new corporate headquarters and manufacturing capability necessary to support small-scale drug substance and drug product manufacturing; (iii) conducting drug manufacturing activities with external third-party contract manufacturing organizations ("CMOs"), including a drug delivery device technology enhancement project; (iv) developmental and regulatory activities for its SB019 program (Coronaviridae (COVID-19)), including a Phase 1 study, targeted for conduct in 2022; (v) preparatory activities for a potential Phase 3 study, targeted for initiation in 2023, related to SB204 as a treatment for acne; and (vi) initial efforts to support potential commercialization of SB206, but excludes: (a) any potential costs associated with other late-stage clinical programs, including executing the potentially registrational Phase 3 study of SB204 for acne; (b) progression of the SB019 program subsequent to execution of a Phase 1 study; (c) operating costs that could occur between a potential NDA submission for SB206 through NDA approval, specifically including marketing and commercialization efforts to achieve potential launch of SB206; and (d) proceeds from any potential future sales of common stock under the July 2020 Aspire CSPA. The Company may decide to revise its development and operating plans or the related timing, depending on information it learns through its research and development activities, including regulatory submission efforts related to SB206, potential commercialization strategies, the impact of outside factors such as the COVID-19 pandemic, its ability to enter into strategic arrangements or other transactions, its ability to access additional capital and its financial priorities. The Company will need significant additional funding to continue its operating activities, make further advancements in its product development programs and potentially commercialize any of its product candidates beyond those activities currently included in its operating forecast and related cash projection.

The Company does not currently have sufficient funds to commercialize any of its product candidates, if approved, and its funding needs will largely be determined by its commercialization strategy for SB206, subject to NDA submission timing and the regulatory approval process. The Company has engaged Syneos Health, a fully integrated biopharmaceutical solutions organization, as its commercial solutions provider for SB206. The Company's relationship with Syneos Health will focus on

implementing the SB206 prelaunch strategy and commercial preparation, if approved by the U.S. Food and Drug Administration.

The inability of the Company to obtain significant additional funding on acceptable terms, including through the utilization of the remaining amount available under the July 2020 Aspire CSPA, could have a material adverse effect on the Company's business and cause the Company to alter or reduce its planned operating activities, including but not limited to delaying, reducing, terminating or eliminating planned product candidate development activities, to conserve its cash and cash equivalents. The Company may pursue additional capital through equity or debt financings, including potential sales under the July 2020 Aspire CSPA, or from non-dilutive sources, including partnerships, collaborations, licensing, grants or other strategic relationships. The Company's anticipated expenditure levels may change if it adjusts its current operating plan. Such actions could delay development timelines and have a material adverse effect on its business, results of operations, financial condition and market valuation.

The Company's equity issuances during the year ended December 31, 2021 and 2020, have resulted in significant dilution to its existing stockholders. Any future additional issuances of equity, or debt convertible into equity, would result in further significant dilution to the Company's existing stockholders. As of December 31, 2021 the Company had 18,815,892 shares of common stock outstanding. In addition, as of December 31, 2021, the Company had reserved 3,065,953 shares of common stock for future issuance related to (i) outstanding warrants to purchase common stock; (ii) outstanding stock options and stock appreciation rights; and (iii) future issuance under the 2016 Incentive Award Plan. As of December 31, 2021, the Company's common stock consists of 200,000,000 authorized shares.

The Company is also exploring the potential for strategic transactions, such as strategic acquisitions or in-licenses, sales or divestitures of some of its assets, or other potential strategic transactions, which could include a sale of the Company. If the Company were to pursue such a transaction, it may not be able to complete the transaction on a timely basis or at all or on terms that are favorable to the Company. Alternatively, if the Company is unable to obtain significant additional funding on acceptable terms or progress with a strategic transaction, it could instead determine to dissolve and liquidate its assets or seek protection under the bankruptcy laws. If the Company decides to dissolve and liquidate its assets or to seek protection under the bankruptcy laws, it is unclear to what extent the Company will be able to pay its obligations, and, accordingly, it is further unclear whether and to what extent any resources will be available for distributions to stockholders.

COVID-19

In December 2019, the novel strain of a virus named SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), which causes novel coronavirus disease ("COVID-19") was reported in China, and in March 2020, the World Health Organization declared it a pandemic. The extent to which COVID-19, and its variant strains, and domestic and global efforts to contain its spread will impact the Company's business including its operations, preclinical studies, clinical trials, and financial condition will depend on future developments, which are highly uncertain and cannot be predicted at this time, and include the duration, severity and scope of the pandemic, the availability and effectiveness of vaccines in preventing the spread of COVID-19 (and its variants), and the actions taken by other parties, such as governmental authorities, to contain and treat COVID-19 and its variants.

During the pandemic, the timetable for development of the Company's product candidates has been impacted and may face further disruption and the Company's business could be further adversely affected by the outbreak of COVID-19 and its variants. In particular, COVID-19 impacted the timing of trial initiation of the Company's B-SIMPLE4 Phase 3 study and is one factor influencing the Company's adjustment of its targeted SB206 submission timing, planned no later than the fourth quarter of 2022. The Company previously articulated a targeted NDA submission of SB206 during the third quarter of 2022, however, due to factors including supply chain constraints, impacts of the COVID-19 pandemic, certain manufacturing related equipment issues and scheduling challenges, both within the Company's corporate facility and with third-party CMOs, it has adjusted its expected timing accordingly. The Company continues to assess any further impact of COVID-19 on its operations.

In addition, the Company currently relies on third parties in connection with sourcing the raw materials used in the manufacture of its product candidates, transporting certain materials relating to its product candidates and manufacturing drug product. The Company continues to assess any further impact of COVID-19 on its supply chain and related vendors, and the impact of global supply chain constraints across various industries, including interruption of, or delays in receiving supplies of raw materials, active pharmaceutical ingredient ("API") or drug product from third-party manufacturers due to staffing shortages, production slowdowns or stoppages and disruptions in delivery systems. The Company is also continuing to evaluate the impacts of COVID-19 and global supply chain constraints on its work to commission its new facility. The Company expects to complete the commissioning and validation of its new facility to support various research and development and current good

manufacturing practice ("cGMP"), activities, including small-scale manufacturing capabilities for API and drug product, by the end of the first half of 2022.

The extent to which COVID-19 and its variants may impact the Company's financial condition or results of operations in the future is uncertain.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amount of revenues and expenses during the reporting period. Actual results could differ from these estimates.

Reclassifications

Certain amounts in the Company's consolidated balance sheet as of December 31, 2020 have been reclassified to conform to current presentation related to deferred offering costs in the amount of $58 being included with prepaid expenses and other current assets. These reclassifications had no impact on the Company's consolidated current assets or on the consolidated statements of operations and comprehensive loss or cash flows for the year ended December 31, 2020.

Certain amounts in the Company's consolidated balance sheet as of December 31, 2020 have been reclassified to conform to current presentation related to the May 25, 2021 Reverse Stock Split. The reclassified amount between common stock and additional paid-in capital was $13 as of December 31, 2020. These reclassifications had no impact on the Company's consolidated stockholders' equity or on the consolidated statements of operations and comprehensive loss or cash flows for the year ended December 31, 2020.

Immaterial Revision

During the course of preparing the Company's consolidated financial statements as of and for the year ended December 31 2021, the Company completed an Internal Revenue Code Section 382 and 383 analysis of its historical net operating loss and tax credit carryforward amounts. As a result, a portion of the prior year net operating loss and tax credit carryforwards were determined to be limited. See Note 13—Income Taxes, for further details.

Cash and Cash Equivalents

The Company considers all highly liquid instruments purchased with a maturity of three months or less to be cash equivalents. Cash and cash equivalents include deposits and money market accounts.

Restricted Cash

Restricted cash as of December 31, 2021 includes funds maintained in a deposit account to secure a letter of credit for the benefit of the New Landlord (as defined below). See Note 8—Commitments and Contingencies for further information regarding the letter of credit and the New Lease (as defined below).

Concentration of Credit Risk

Financial instruments that potentially subject the Company to a concentration of credit risk consist principally of cash and cash equivalents. The Company places its cash and cash equivalents with financial institutions and these deposits may at times be in excess of insured limits.

Contracts and Grants Receivable

The Company carries its contracts and grants receivable net of an allowance for doubtful accounts. All receivables or portions thereof that are deemed to be uncollectible or that require excessive collection costs are written off to the allowance for doubtful accounts when it is probable that the receivable is unrecoverable. The Company actively reviews and evaluates its contracts and grants receivable, but no allowance for doubtful accounts has been considered necessary as of December 31, 2021 or 2020. Actual results could differ from the estimates that were used.

Intangible Assets

Intangible assets represent the cost to obtain and register the Company's internet domain. Indefinite-lived intangible assets are not amortized and are assessed for impairment at least annually.

Property and Equipment

Property and equipment are recorded at cost and depreciated using the straight-line method over their estimated useful lives as follows:

Computer and office equipment	3 years
Furniture and fixtures	5-7 years
Laboratory equipment	7 years

Leasehold improvements are amortized over the shorter of the life of the lease or the useful life of the improvements. Expenditures for maintenance and repairs are expensed as incurred. Improvements and betterments that add new functionality or extend the useful life of an asset are capitalized. Leases for real estate often include tenant improvement allowances, which the Company assesses according to applicable accounting guidance to determine the appropriate owner, and capitalizes such tenant improvement assets accordingly.

Intellectual Property

The Company's policy is to file patent applications to protect technology, inventions and improvements that are considered important to its business. Patent positions, including those of the Company, are uncertain and involve complex legal and factual questions for which important legal principles are largely unresolved. Due to the uncertainty of future value to be realized from the expenses incurred in developing the Company's intellectual property, the cost of filing, prosecuting and maintaining internally developed patents are expensed as general and administrative costs as incurred.

Leases

The Company leases office space and certain equipment under non-cancelable lease agreements. The Company applies the accounting guidance in ASC 842, *Leases.* As such, the Company assesses all arrangements, that convey the right to control the use of property, plant and equipment, at inception, to determine if it is, or contains, a lease based on the unique facts and circumstances present in that arrangement. For those leases identified, the Company determines the lease classification, recognition, and measurement at the lease commencement date. For arrangements that contain a lease the Company: (i) identifies lease and non-lease components; (ii) determines the consideration in the contract; (iii) determines whether the lease is an operating or financing lease; and (iv) recognizes lease Right of Use ("ROU") assets and corresponding lease liabilities. Lease liabilities are recorded based on the present value of lease payments over the expected lease term. The corresponding ROU asset is measured from the initial lease liability, adjusted by (i) accrued or prepaid rents; (ii) remaining unamortized initial direct costs and lease incentives; and (iii) any impairments of the ROU asset.

The Company elected the practical expedient to not separate non-lease components from the lease components. Fixed lease payments on operating leases are recognized over the expected term of the lease on a straight-line basis. Variable lease expenses that are not considered fixed are expensed as incurred. Fixed and variable lease expense on operating leases is recognized within operating expenses within the accompanying consolidated statements of operations and comprehensive loss. The Company has elected the short-term lease exemption and, therefore, does not recognize an ROU asset or corresponding liability for lease arrangements with an original term of 12 months or less.

The interest rate implicit in the Company's lease contracts is typically not readily determinable and as such, the Company uses its incremental borrowing rate based on the information available at the lease commencement date, which represents an internally developed rate that would be incurred to borrow, on a collateralized basis, over a similar term, an amount equal to the lease payments in a similar economic environment.

Assets Held for Sale

The Company generally considers assets to be held for sale when (i) the Company commits to a plan to sell the assets, (ii) the assets are available for immediate sale in their present condition, (iii) the Company has initiated an active program to locate a buyer and other actions required to complete the plan to sell the assets, (iv) consummation of the planned sale transaction is probable, (v) the assets are being actively marketed for sale at a price that is reasonable in relation to their current fair value, (vi) the transaction is expected to qualify for recognition as a completed sale, within one year, and (vii) significant changes to or withdrawal of the plan is unlikely. Following the classification of any depreciable assets within a disposal group as held for sale, the Company discontinues depreciating the asset and writes down the asset to the lower of carrying value or fair market value less cost to sell, if needed.

See Note 16—Assets Held for Sale, Impairment Charges for a discussion of the Company's application of this accounting policy.

Impairment of Long-Lived Assets

Long-lived assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of an asset exceeds its estimated future cash flows, an impairment charge is recognized for an amount by which the carrying amount of the asset exceeds the fair value of the asset.

As described in Note 8—Commitments and Contingencies, on July 16, 2020, the Company entered into a lease termination agreement, which provided for the early termination of the existing lease for the Company's previous corporate headquarters and sole research, development and manufacturing facility. In contemplation of this transaction, during June 2020, the Company decommissioned the areas within the facility, as well as the associated equipment, that supported the Company's large scale cGMP drug manufacturing capability in preparation for execution of the lease termination agreement. The performance of decommissioning activities as noted above was considered to be a triggering event that caused the Company to evaluate its long-lived assets for impairment as of June 29, 2020, principally its right of use lease asset and its property, plant and equipment, including leasehold improvements. See Note 16—Assets Held for Sale, Impairment Charges for a discussion of the Company's evaluation of its long-lived assets for impairment. The Company also recorded an additional loss based upon Company-specific facts and circumstances associated with the July 2020 lease termination transaction during the year ended December 31, 2020. See Note 17—Asset Group Disposition for additional detail regarding the loss on the Company's facility asset group disposition.

Revenue Recognition

The Company accounts for revenue in accordance with ASC Topic 606, *Revenue from Contracts with Customers*. To determine revenue recognition for arrangements that the Company determines are within the scope of Topic 606, the Company performs the following five steps: (i) identify the contracts with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) the entity satisfies a performance obligation. The Company only applies the five-step model to contracts when it is probable that the entity will collect the consideration it is entitled to in exchange for the goods or services it transfers to the customer.

At contract inception, once the contract is determined to be within the scope of Topic 606, the Company assesses the goods or services promised within each contract and determines those that are performance obligations and assesses whether each promised good or service is distinct. The Company then recognizes as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

Upon occurrence of a contract modification, the Company conducts an evaluation pursuant to the modification framework in Topic 606 to determine the appropriate revenue recognition. The framework centers around key questions, including (i) whether the modification adds additional goods and services, (ii) whether those goods and services are distinct, and (iii) whether the contract price increases by an amount that reflects the standalone selling price for the new goods or services. The resulting conclusions will determine whether the modification is treated as a separate, standalone contract or if it is combined with the original contract and accounted for in that manner. In addition, some modifications are accounted for on a prospective basis and others on a cumulative catch-up basis.

The Company's agreements may contain some or all the following types of provisions or payments:

Licenses of Intellectual Property: If the license of the Company's intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, the Company recognizes revenues from non-refundable, upfront fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. For licenses that are bundled with other promises, the Company utilizes judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the estimated performance period and the appropriate method of measuring progress during the performance period for purposes of recognizing revenue. The Company re-evaluates the estimated performance period and measure of progress each reporting period and, if necessary, adjusts related revenue recognition accordingly.

Milestone Payments: At the inception of each arrangement that includes development milestone payments, the Company evaluates whether the milestones are considered probable of being reached and estimates the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. The transaction price is then allocated to each performance obligation on a relative stand-alone selling price basis, for which the Company recognizes revenue as or when the performance obligations under the contract are satisfied. At the end of each subsequent reporting period, the Company re-evaluates the probability of achievement of such development milestones and any related constraint, and if necessary, adjusts its estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect license and collaboration revenue and earnings in the period of adjustment.

Manufacturing Supply Services: Arrangements that include a promise for future supply of drug substance or drug product for either clinical development or commercial supply at the customer's discretion are generally considered as options. The Company assesses if these options provide a material right to the licensee and if so, they are accounted for as separate performance obligations. If the Company is entitled to additional payments when the customer exercises these options, any additional payments are recorded in license and collaboration revenue when the customer obtains control of the goods, which is upon delivery.

Royalties: For arrangements that include sales-based royalties, including milestone payments based on the level of sales, and the license is deemed to be the predominant item to which the royalties relate, the Company recognizes revenue at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). To date, the Company has not recognized any royalty revenue resulting from any of its licensing arrangements.

See Note 5—Revenue Recognition for information regarding the Company's license agreements.

The Company's revenue also includes research revenue earned under contracts and grants with Federal government agencies, which relates to the research and development of its nitric oxide platform.

Government research contracts and grants revenue. Under the terms of the contracts and grants awarded, the Company is entitled to receive reimbursement of its allowable direct expenses, allocated overhead, general and administrative expenses and payment of other specified amounts. Revenues from development and support activities under government research contracts and grants are recorded in the period in which the related costs are incurred. Associated expenses are recognized when incurred as research and development expense. Revenue recognized in excess of amounts collected from funding sources are recorded as contracts and grants receivable. Any of the funding sources may, at their discretion, request reimbursement for expenses or return of funds, or both, as a result of noncompliance by the Company with the terms of the grants. No reimbursement of expenses or return of funds has been requested or made since inception of the contracts and grants. See Note 5—Revenue Recognition for information regarding government grants.

Research and Development Expenses

Research and development expenses include all direct and indirect development costs incurred for the development of the Company's drug candidates. These expenses include salaries and related costs, including stock-based compensation and travel costs for research and development personnel, allocated facility costs, laboratory and manufacturing materials and supplies, consulting fees, product development, preclinical studies, clinical trial costs, licensing fees and milestone payments under license agreements and other fees and costs related to the development of drug candidates. The cost of tangible and intangible assets that are acquired for use on a particular research and development project, have no alternative future uses, and are not required to be capitalized in accordance with the Company's capitalization policy, are expensed as research and development costs as incurred.

Accrued Outside Research and Development Accruals

The Company is required to estimate its expenses resulting from its obligations under contracts with clinical research organizations, clinical site agreements, vendors, and consultants in connection with conducting clinical trials and preclinical development. The financial terms of these contracts are subject to negotiations which vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided to the Company under such contracts. The Company's objective is to reflect the appropriate development and clinical trial expenses in its financial statements by matching those expenses with the period in which the services and efforts are expended.

For clinical trials, the Company accounts for these expenses according to the progress of the trial as measured by actual hours expended by contract research organization personnel, investigator performance or completion of specific tasks, patient progression, or timing of various aspects of the trial. During the course of a clinical trial, the Company adjusts its rate of clinical trial expense recognition if actual results differ from its estimates. The Company utilizes judgment and experience to estimate its accrued expenses as of each balance sheet date in its financial statements based on facts and circumstances known at that time. Although the Company does not expect its estimates to be materially different from amounts actually incurred, its understanding of status and timing of services performed relative to the actual status and timing of services performed may vary and may result in increases or decreases in research and development expenses in future periods when the actual results become known.

For preclinical development services performed by outside service providers, the Company determines accrual estimates through financial models, considering development progress data received from outside service providers and discussions with applicable Company and service provider personnel.

Classification of Warrants Issued in Connection with Offerings of Common Stock

The Company accounts for common stock warrants as either equity-classified or liability-classified instruments based on an assessment of the warrant's specific terms and applicable authoritative guidance in FASB ASC 480, *Distinguishing Liabilities from Equity* ("ASC 480") and ASC 815, *Derivatives and Hedging* ("ASC 815"). The assessment considers whether the warrants are freestanding financial instruments pursuant to ASC 480, whether the warrants meet the definition of a liability pursuant to ASC 480, and whether the warrants meet all of the requirements for equity classification under ASC 815, including whether the warrants are indexed to the Company's own common stock and whether the warrant holders could potentially require "net cash settlement" in a circumstance outside of the Company's control, among other conditions for equity classification. This assessment, which requires the use of professional judgment, is conducted at the time of warrant issuance and as of each subsequent quarterly period end date while the warrants are outstanding.

For issued or modified warrants that meet all of the criteria for equity classification, the warrants are required to be recorded as a component of additional paid-in capital at the time of issuance. For issued or modified warrants that do not meet all the criteria for equity classification, the warrants are required to be recorded at their initial fair value on the date of issuance, and remeasured each balance sheet date thereafter. Changes in the estimated fair value of the liability-classified warrants are recognized as a non-cash gain or loss in the accompanying consolidated statements of operations and comprehensive loss.

Fair Value of Financial Instruments

The carrying values of cash equivalents, contracts and grants receivable, accounts payable and accrued liabilities as of December 31, 2021 and 2020 approximated their fair values due to the short-term nature of these items.

The Company has categorized its financial instruments, based on the priority of the inputs used to value the investments, into a three-level fair value hierarchy. The fair value hierarchy gives the highest priority to quoted prices in active markets for identical assets or liabilities (Level 1) and lowest priority to unobservable inputs (Level 3). If the inputs used to measure the investments fall within different levels of the hierarchy, the categorization is based on the lowest level input that is significant to the fair value measurement of the investment. Financial instruments recorded in the accompanying consolidated balance sheets are categorized based on the inputs to valuation techniques as follows:

Level 1 - Observable inputs that reflect unadjusted quoted market prices for identical assets or liabilities in active markets.

Level 2 - Observable inputs other than Level 1 that are observable, either directly or indirectly, in the marketplace for identical or similar assets and liabilities.

Level 3 - Unobservable inputs that are supported by little or no market data, where values are derived from techniques in which one or more significant inputs are unobservable.

Stock-Based Compensation

Equity-Based Awards

The Company applies the fair value method of accounting for stock-based compensation, which requires all such compensation to employees, including the grant of employee stock options, to be recognized in the accompanying consolidated statements of operations and comprehensive loss based on its fair value at the measurement date (generally the grant date). The expense associated with stock-based compensation is recognized over the requisite service period of each award. For awards with only service conditions and graded-vesting features, the Company recognizes compensation cost on a straight-line basis over the requisite service period. Stock-based awards granted to non-employee directors as compensation for serving on the Company's board of directors are accounted for in the same manner as employee stock-based compensation awards.

The fair value of each option grant is estimated using a Black-Scholes option-pricing model on the grant date using expected volatility, risk-free interest rate, expected life of options and fair value per share assumptions. Due to limited historical data, the Company estimates stock price volatility based on the actual volatility of comparable publicly traded companies over the expected life of the option. In evaluating similarity, the Company considered factors such as industry, stage of life cycle, financial leverage, size and risk profile.

The Company does not have sufficient stock option exercise history to estimate the expected term of employee stock options and thus continues to calculate expected life based on the mid-point between the vesting date and the contractual term, which is in accordance with the simplified method. The expected term for stock-based compensation granted to non-employees is the contractual life. The risk-free rate is based on the United States Treasury yield curve during the expected life of the option. The Company estimates forfeitures based on the historical experience of the Company and adjusts the estimated forfeiture rate based upon actual experience.

Liability-Based Awards

Stock appreciation rights ("SARs") that include cash settlement features are accounted for as liability-based awards pursuant to ASC 718 *Share Based Payments*. The fair value of such SARs is estimated using a Black-Scholes option-pricing model on each financial reporting date using expected volatility, risk-free interest rate, expected life and fair value per share assumptions.

The fair value of obligations under the Tangible Stockholder Return Plan are estimated using a Monte Carlo simulation approach. The Company's common stock price is simulated under the Geometric Brownian Motion framework under each simulation path. The other assumptions for the Monte Carlo simulation include the risk-free interest rate, estimated volatility and the expected term.

The fair value of each liability award is estimated with a valuation model that uses certain assumptions, such as the award date, expected volatility, risk-free interest rate, expected life of the award and fair value per share assumptions. The Company estimates stock price volatility based on either (i) the actual volatility of comparable publicly traded companies over the expected term, considering factors such as industry, stage of life cycle, financial leverage, size and risk profile or (ii) the Company's actual historical volatility over a historical period equal to the expected remaining life of the award, if such historical data is available. The expected term for liability-based awards is the estimated contractual life. The risk-free rate is based on the United States Treasury yield curve during the expected life of the award.

Income Taxes

Deferred tax assets and liabilities are determined based on the temporary differences between the financial statement carrying amounts and the tax bases of assets and liabilities using the enacted tax rates in effect in the years in which the differences are expected to reverse. In estimating future tax consequences, all expected future events are considered other than enactment of changes in the tax law or rates.

The Company did not record a federal or state income tax benefit for the years ended December 31, 2021 and 2020 due to its conclusion that a full valuation allowance is required against the Company's deferred tax assets.

The determination of recording or releasing a tax valuation allowance is made, in part, pursuant to an assessment performed by management regarding the likelihood that the Company will generate future taxable income against which benefits of its deferred tax assets may or may not be realized. This assessment requires management to exercise judgment and make estimates with respect to its ability to generate taxable income in future periods.

The Company recognizes the tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by the taxing authorities based on the technical merits of the position.

The Company's policy for recording interest and penalties is to record them as a component of general and administrative expenses. As of December 31, 2021 and 2020, the Company accrued no interest and penalties related to uncertain tax positions.

Tax years 2018-2020 remain open to examination by the major taxing jurisdictions to which the Company is subject. Additionally, years prior to 2018 are also open to examination to the extent of loss and credit carryforwards from those years.

In accordance with Section 382 of the Internal Revenue Code of 1986, as amended, a change in equity ownership of greater than 50% within a three-year period results in an annual limitation on the Company's ability to utilize its net operating loss carryforwards and general business credits, including the research and development credits, created during the tax periods prior to the change in ownership.

During the course of preparing the Company's consolidated financial statements as of and for the year ended December 31 2021, the Company completed an Internal Revenue Code Section 382 and 383 analysis of its historical net operating loss and tax credit carryforward amounts. As a result, a portion of the prior year net operating loss and tax credit carryforwards were determined to be limited. See Note 13—Income Taxes, for further details. If the Company experiences another change in equity ownership which exceeds the Section 382 threshold, the Company's net operating loss carryforwards and research and development credits may be subject to additional limitations.

Comprehensive Loss

Comprehensive loss is defined as the change in equity of a business enterprise during a period from transactions and other events and circumstances from non-owner sources. For the years ended December 31, 2021 and 2020, comprehensive loss was equal to net loss.

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 for the period. Diluted net loss per share is calculated by adjusting weighted average shares outstanding for the dilutive effect of common stock equivalents outstanding for the period.

The following securities, presented on a common stock equivalent basis, have been excluded from the calculation of weighted average common shares outstanding for the years ended December 31, 2021 and 2020 because the effect is anti-dilutive due to the net loss reported in each of those periods. All share amounts presented in the table below represent the total number outstanding as of the end of each period.

	December 31,	
	2021	2020
Warrants to purchase common stock (Note 10)	1,274,176	1,377,727
Stock options outstanding under the 2008 and 2016 Plans (Note 11)	517,303	190,449
Stock appreciation rights outstanding under the 2016 Plan (Note 11)	60,000	61,000
Inducement stock options outstanding (Note 11)	1,250	8,750

Segment and Geographic Information

The Company has determined that it operates in one segment. The Company uses its nitric oxide-based technology to develop product candidates. The Chief Executive Officer, who is the Company's chief operating decision maker, reviews financial information on an aggregate basis for purposes of allocating resources and evaluating financial performance. The Company has only had limited revenue since its inception, but substantially all revenue was derived from licensing agreements originating in the United States. All of the Company's long-lived assets are maintained in the United States

Although all operations are based in the United States, the Company generated revenue from its licensing partner in Japan of $2,822, or approximately 95% of total revenue during the year ended December 31, 2021, and $4,208, or approximately 86% of total revenue during the year ended December 31, 2020.

Recently Issued Accounting Standards

Accounting Pronouncements Adopted

In December 2019, the FASB issued ASU No. 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes*. This guidance is intended to improve consistent application of and simplify the accounting for income taxes. This ASU removes certain exceptions to the general principles in Topic 740 and clarifies and amends existing guidance. This standard is effective for annual reporting periods beginning after December 15, 2020, including interim reporting periods within those annual reporting periods, with early adoption permitted. This ASU was effective for the Company as of January 1, 2021. The adoption of this new accounting guidance did not have a material impact on the Company's consolidated financial statements.

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*. This guidance is intended to simplify the accounting for certain financial instruments with characteristics of liabilities and equity. This standard is effective for annual reporting periods beginning after December 15, 2021, including interim reporting periods within those annual reporting periods. Early adoption is permitted, but no earlier than fiscal years beginning after December 15, 2020. The Company adopted this ASU during the year ended December 31, 2021. The adoption of this new accounting guidance did not have a material impact on the Company's consolidated financial statements.

Note 2: KNOW Bio, LLC

On December 30, 2015, the Company completed the distribution of 100% of the outstanding member interests of KNOW Bio, LLC ("KNOW Bio"), a former wholly owned subsidiary of the Company, to Novan's stockholders (the "Distribution"), pursuant to which KNOW Bio became an independent privately held company.

KNOW Bio Technology Agreements

In connection with the Distribution, the Company entered into exclusive license agreements and sublicense agreements with KNOW Bio, as described below. The agreements will continue for so long as there is a valid patent claim under the respective agreement, unless earlier terminated, and upon expiration, will continue as perpetual non-exclusive licenses. KNOW Bio has the right to terminate each such agreement, for any reason upon 90 days advance written notice to the Company.

License of existing and potential future intellectual property to KNOW Bio. The Company and KNOW Bio entered into an exclusive license agreement dated December 29, 2015 (the "KNOW Bio License Agreement"). Pursuant to the terms of the KNOW Bio License Agreement, the Company granted to KNOW Bio exclusive licenses, with the right to sublicense, under certain United States and foreign patents and patent applications that were controlled by the Company as of December 29, 2015 or that became controlled by the Company between that date and December 29, 2018, directed towards nitric-oxide releasing compositions and methods of manufacturing thereof, including methods of manufacturing Nitricil compounds and other nitric oxide-based therapeutics.

Sublicense of UNC and other third party intellectual property to KNOW Bio. The Company and KNOW Bio also entered into sublicense agreements dated December 29, 2015 (the "KNOW Bio Sublicense Agreements" and together with the KNOW Bio License Agreement, the "Original KNOW Bio Agreements"). Pursuant to the terms of the KNOW Bio Sublicense Agreements, the Company granted to KNOW Bio exclusive sublicenses, with the ability to further sublicense, under certain of the United States and foreign patents and patent applications exclusively licensed to the Company from the University of North Carolina at Chapel Hill ("UNC") under the Amended, Restated and Consolidated License Agreement dated June 27, 2012, as amended (the "UNC License Agreement"), and another third party directed towards nitric oxide-releasing compositions, to develop and commercialize products utilizing the licensed technology. Under the exclusive sublicense to the UNC patents and applications (the "UNC Sublicense Agreement"), KNOW Bio is subject to the terms and conditions under the UNC License Agreement, including milestone and diligence payment obligations. However, pursuant to the terms of the UNC License Agreement, the Company is directly obligated to pay UNC any future milestones or royalties, including those resulting from actions conducted by the Company's sublicensees, including KNOW Bio. Therefore, in the event of KNOW Bio non-performance with respect to its obligations under the UNC Sublicense Agreement, the Company would be obligated to make such payments to UNC. KNOW Bio would then become obligated to repay the Company pursuant to the UNC Sublicense Agreement, otherwise KNOW Bio would be in breach of its agreements with the Company and intellectual property rights would revert back to the Company. There were no milestone or royalty payments required during the years ended December 31, 2021 and 2020.

Amendments to License and Sublicense Agreements with KNOW Bio

On October 13, 2017, the Company and KNOW Bio entered into certain amendments to the Original KNOW Bio Agreements (the "KNOW Bio Amendments"). Pursuant to the terms of the KNOW Bio Amendments, the Company re-acquired from KNOW Bio exclusive, worldwide rights under certain United States and foreign patents and patent applications controlled by the Company as of December 29, 2015, and that became controlled by the Company between December 29, 2015 and December 29, 2018, directed towards nitric oxide-releasing compositions and methods of manufacturing thereof, including methods of manufacturing Nitricil compounds, and other nitric oxide-based therapeutics, to develop and commercialize products for all diagnostic, therapeutic, prophylactic and palliative uses for any disease, condition or disorder caused by certain oncoviruses (the "Oncovirus Field").

KNOW Bio also granted to the Company an exclusive license, with the right to sublicense, under any patents and patent applications which became controlled by KNOW Bio during the three-year period between December 29, 2015 and December 29, 2018 and directed towards nitric oxide-releasing compositions and methods of manufacturing thereof, including methods of manufacturing Nitricil compounds, and other nitric oxide-based therapeutics, but not towards medical devices, to develop and commercialize products for use in the Oncovirus Field.

Upon execution of the KNOW Bio Amendments, in exchange for the Oncovirus Field rights, the Company paid a non-refundable upfront payment of $250. Products the Company develops in the Oncovirus Field based on Nitricil will not be subject to any further milestones, royalties or sublicensing payment obligations to KNOW Bio under the KNOW Bio Amendments. However, if the Company develops products in the Oncovirus Field that incorporate a certain nitric oxide-releasing composition specified in the KNOW Bio Amendments and (i) are covered by KNOW Bio patents or (ii) materially use or incorporate know-how of KNOW Bio or the Company related to such composition that was created between December 29, 2015 and December 29, 2018, the Company would be obligated to make the certain contingent milestone and royalty payments to KNOW Bio under the KNOW Bio Amendments.

The rights granted to the Company in the Oncovirus Field in the KNOW Bio Amendments continue for so long as there is a valid patent claim under the Original KNOW Bio Agreements, and upon expiration continue on a perpetual non-exclusive basis, and are subject to the termination rights of KNOW Bio and the Company that are set forth in the Original KNOW Bio Agreements. In addition, under the KNOW Bio Amendments, KNOW Bio may terminate the rights granted to the Company in the Oncovirus Field without terminating the Original KNOW Bio Agreements.

The KNOW Bio Amendments also provide a mechanism whereby either party can cause a new chemical entity ("NCE") covered by the Original KNOW Bio Agreements to become exclusive to such party by filing an investigational new drug application ("IND") on the NCE. An NCE that becomes exclusive to a party under this provision may not be commercialized by the other party until the later of expiration of patents covering the NCE or regulatory exclusivity covering the NCE. A party who obtains exclusivity for an NCE must advance development of the NCE pursuant to terms of the KNOW Bio Amendments in order to maintain such exclusivity; otherwise, such exclusivity will expire.

The terms of the KNOW Bio Amendments were negotiated at arms-length and do not provide the Company with an ability to significantly influence KNOW Bio or its operations.

Note 3: Research and Development Licenses

The Company has entered into various licensing agreements with universities and other research institutions under which the Company receives the rights, and in some cases substantially all of the rights, of the inventors, assignees or co-assignees to produce and market technology protected by certain patents and patent applications. The Company's primary license agreement is with UNC and is described in further detail within the subsection below. The counterparties to the Company's various other licensing agreements are the University of Akron Research Foundation, Hospital for Special Surgery, Strakan International S.a.r.l., which is a licensee of the University of Aberdeen, KIPAX AB and KNOW Bio. The Company is generally required to make milestone payments based on development milestones and will be required to make royalty payments based on a percentage of future sales of covered products or a percentage of sublicensing revenue. Costs to acquire rights under license agreements and pre-commercialization milestone payments are classified as research and development expenses in the accompanying consolidated statements of operations and comprehensive loss. Research and development expense recognized in connection with the incurrence of such costs totaled zero dollars during each of the years ended December 31, 2021 and 2020.

The Company is generally required by the various licensing agreements to reimburse the licensor for certain legal and other patent related costs. These costs are expensed as incurred and are classified as general and administrative expenses in the accompanying consolidated statements of operations and comprehensive loss. General and administrative expense recognized

in connection with the incurrence of such costs totaled $137 and $103 during the years ended December 31, 2021 and 2020, respectively.

These license arrangements could require the Company to make payments upon achievement of certain milestones by the Company. As future royalty payments are directly related to future revenues (either sales or sublicensing), future commitments cannot be determined. No accrual for future payments under these agreements has been recorded, as the Company cannot estimate if, when or in what amount payments may become due.

UNC License Agreement

The UNC License Agreement provides the Company with an exclusive license to issued patents and pending applications directed to the Company's library of Nitricil compounds, including patents issued in the United States, Canada, Italy, Great Britain, France, Ireland, Germany, Finland, Spain, Sweden, Switzerland, Japan and Australia, with claims intended to cover NVN1000, the NCE for the Company's current product candidates. The UNC License Agreement requires the Company to pay UNC up to $425 in regulatory and commercial milestones on a licensed product by licensed product basis and a running royalty percentage in the low single digits on net sales of licensed products. Licensed products include any products being developed by the Company or by its sublicensees.

Unless earlier terminated by the Company at its election, or if the Company materially breaches the agreement or becomes bankrupt, the UNC License Agreement remains in effect on a country by country and licensed product by licensed product basis until the expiration of the last to expire issued patent covering such licensed product in the applicable country. The projected date of expiration of the last to expire of the patents issued under the UNC License Agreement is 2033.

Note 4: Licensing Arrangements

Sato License Agreement

Significant Terms

On January 12, 2017, the Company entered into a license agreement, and related first amendment, with Sato Pharmaceutical Co., Ltd. ("Sato"), relating to SB204, its drug candidate for the treatment of acne vulgaris in Japan (the "Sato Agreement"). Pursuant to the Sato Agreement, the Company granted to Sato an exclusive, royalty-bearing, non-transferable right and license under certain of the Company's intellectual property rights, with the right to sublicense with the Company's prior written consent, to develop, use and sell products in Japan that incorporate SB204 in certain topical dosage forms for the treatment of acne vulgaris, and to make the finished form of such products.

On October 5, 2018, the Company and Sato entered into the second amendment (the "Sato Amendment") to the Sato Agreement (collectively, the "Amended Sato Agreement"). The Sato Amendment expanded the Sato Agreement to include SB206, the Company's drug candidate for the treatment of viral skin infections. Pursuant to the Amended Sato Agreement, the Company granted to Sato an exclusive, royalty-bearing, non-transferable license under certain of its intellectual property rights, with the right to sublicense with the Company's prior written consent, to develop, use and sell products in Japan that incorporate SB204 or SB206 in certain topical dosage forms for the treatment of acne vulgaris or viral skin infections, respectively, and to make the finished form of such products. The Company or its designated contract manufacturer will supply finished product to Sato for use in the development of SB204 and SB206 in the licensed territory. The rights granted to Sato do not include the right to manufacture the API of SB204 or SB206; rather, the parties agreed to negotiate a commercial supply agreement pursuant to which the Company or its designated contract manufacturer would be the exclusive supplier to Sato of the API for the commercial manufacture of licensed products in the licensed territory. Under the terms of the Amended Sato Agreement, the Company also has exclusive rights to certain intellectual property that may be developed by Sato in the future, which the Company could choose to use for its own development and commercialization of SB204 or SB206 outside of Japan.

Under the Amended Sato Agreement, in exchange for the SB204 and SB206 license rights granted to Sato, Sato agreed to pay the Company the following:

- An upfront payment of 1.25 billion Japanese Yen ("JPY"), payable in installments of 0.25 billion JPY, 0.5 billion JPY and 0.5 billion JPY on October 5, 2018, February 14, 2019 and September 13, 2019, respectively. This was in addition to the 1.25 billion JPY (approximately $10,813 USD) paid on January 19, 2017 following the execution of the Sato Agreement on January 12, 2017. On October 23, 2018, the Company received the first installment from the Amended Sato Agreement of 0.25 billion JPY (approximately $2,224 USD). On March 14, 2019, the Company received the second installment payment related to the Amended Sato Agreement of 0.5 billion JPY (approximately $4,460 USD). On November 7, 2019, the Company received the third installment payment related to the Amended Sato Agreement of 0.5 billion JPY (approximately $4,554 USD).

- Up to an aggregate of 1.75 billion JPY (adjusted from 2.75 billion JPY in the Sato Agreement) upon the achievement of various development and regulatory milestones, including (i) a 0.25 billion JPY (approximately $2,162 USD) milestone payment received during the fourth quarter of 2018 following Sato's initiation of a Phase 1 trial in Japan and (ii) an aggregate of 1.0 billion JPY that becomes payable upon the earlier occurrence of specified fixed future dates or the achievement of milestone events, of which the Company received a payment of 0.5 billion JPY (approximately $4,572 USD) during the second quarter of 2021.
- Up to an aggregate of 3.9 billion JPY (adjusted from 0.9 billion JPY in the Sato Agreement) upon the achievement of various commercial milestones.
- A tiered royalty ranging from a mid-single digit to a low-double digit percentage (adjusted from a mid-single digit percentage in the Sato Agreement) of net sales of licensed products in the licensed territory, subject to a reduction in the royalty payments in certain circumstances.

The term of the Amended Sato Agreement (and the period during which Sato must pay royalties under the amended license agreement) expires on the twentieth anniversary of the first commercial sale of a licensed product in the licensed field in the licensed territory (adjusted from the tenth anniversary of the first commercial sale in the Sato Agreement). The term of the Amended Sato Agreement may be renewed with respect to a licensed product by mutual written agreement of the parties for additional two-year periods following expiration of the initial term. All other material terms of the Sato Agreement remain unchanged by the Sato Amendment.

Sato is responsible for funding the development and commercial costs for the program that are specific to Japan. The Company is obligated to perform certain oversight, review and supporting activities for Sato, including: (i) using commercially reasonable efforts to obtain marketing approval of SB204 and SB206 in the United States; (ii) sharing all future scientific information the Company may obtain during the term of the Amended Sato Agreement pertaining to SB204 and SB206; (iii) performing certain additional preclinical studies if such studies are deemed necessary by the Japanese regulatory authority, up to and not to exceed a total cost of $1,000; and (iv) participating in a joint committee that oversees, reviews and approves Sato's development and commercialization activities under the Amended Sato Agreement. Additionally, the Company has granted Sato the option to use the Company's trademarks in connection with the commercialization of licensed products in the licensed territory for no additional consideration, subject to the Company's approval of such use.

The Amended Sato Agreement may be terminated by (i) Sato without cause upon 120 days' advance written notice to the Company; (ii) either party in the event of the other party's uncured material breach upon 60 days' advance written notice; (iii) force majeure; (iv) either party in the event of the other party's dissolution, liquidation, bankruptcy or insolvency; and (v) the Company immediately upon written notice if Sato challenges the validity, patentability, or enforceability of any of the Company's patents or patent applications licensed to Sato under the Amended Sato Agreement. In the event of a termination, no portion of the upfront fees received from Sato are refundable.

Note 5: Revenue Recognition

Sato Agreement

The Company assessed the Sato Agreement in accordance with Topic 606 and concluded that the contract counterparty, Sato, is a customer within the scope of Topic 606. The Company identified the following promises under the Sato Agreement: (i) the grant of the intellectual property license to Sato; (ii) the obligation to participate in a joint committee that oversees, reviews, and approves Sato's research and development activities and provides advisory support during Sato's development process; (iii) the obligation to manufacture and supply Sato with all quantities of licensed product required for development activities in Japan; and (iv) the stand-ready obligation to perform any necessary repeat preclinical studies, up to $1,000 in cost. The Company determined that these promises were not individually distinct because Sato can only benefit from these licensed intellectual property rights and services when bundled together; they do not have individual benefit or utility to Sato. As a result, all promises have been combined into a single performance obligation.

The Sato Agreement also provides that the two parties agree to negotiate in good faith the terms of a commercial supply agreement pursuant to which the Company or a third-party manufacturer would be the exclusive supplier to Sato of the API for the commercial manufacture of licensed products in the licensed territory. The Company concluded this obligation to negotiate the terms of a commercial supply agreement does not create (i) a legally enforceable obligation under which the Company may have to perform and supply Sato with API for commercial manufacturing; or (ii) a material right because the incremental commercial supply fee consideration framework in the Sato Agreement is representative of a stand-alone selling price for the supply of API and does not represent a discount. Therefore, this contract provision is not considered to be a promise to deliver goods or services and is not a performance obligation or part of the combined single performance obligation described above.

Amended Sato Agreement

On October 5, 2018, the Company and Sato entered into the Amended Sato Agreement. The Sato Amendment expanded the Sato Agreement to include SB206, the Company's drug candidate for the treatment of viral skin infections. The Company assessed the Amended Sato Agreement in accordance with Topic 606 and concluded the contract modification should incorporate the additional goods and services provided for in the Amendment into the existing, partially satisfied single bundled performance obligation that will continue to be delivered to Sato over the remaining development period. This contract modification accounting is concluded to be appropriate as the additional goods and services conveyed under the Sato Amendment were determined to not be distinct from the single performance obligation, and the additional consideration provided did not reflect the standalone selling price of those additional goods and services. As such, the Company recorded a cumulative adjustment as of the amendment execution date to reflect revenue that would have been recognized cumulatively for the partially completed bundled performance obligation.

The Company concluded that the following consideration would be included in the transaction price as they were (i) received prior to December 31, 2021, or (ii) payable upon specified fixed dates in the future and are not contingent upon clinical or regulatory success in Japan:

- The 1.25 billion JPY (approximately $10,813 USD) original upfront payment received on January 19, 2017 following the execution of the Sato Agreement on January 12, 2017.
- A milestone payment of 0.25 billion JPY (approximately $2,162 USD) received during the fourth quarter of 2018 following Sato's initiation of a Phase 1 trial in Japan.
- The Sato Amendment upfront payment of 1.25 billion JPY, payable in installments of 0.25 billion JPY, 0.5 billion JPY and 0.5 billion JPY on October 5, 2018, February 14, 2019 and September 13, 2019, respectively. On October 23, 2018, the Company received the first installment from the Amended Sato Agreement of 0.25 billion JPY (approximately $2,224 USD). On March 14, 2019, the Company received the second installment payment related to the Amended Sato Agreement of 0.5 billion JPY (approximately $4,460 USD). On November 7, 2019, the Company received the third installment payment related to the Amended Sato Agreement of 0.5 billion JPY (approximately $4,554 USD).
- An aggregate of 1.0 billion JPY in non-contingent milestone payments that become payable upon the earlier occurrence of specified fixed dates in the future or the achievement of specified milestone events. On May 20, 2021, the Company received one such non-contingent milestone payment in the form of a payment of 0.5 billion JPY (approximately $4,572 USD) related to achievement of a time-based developmental milestone.

The payment terms contained within the Amended Sato Agreement related to upfront, developmental milestone and sales milestone payments are of a short-term nature and, therefore, do not represent a financing component requiring additional consideration.

The following table presents the Company's contract assets and contract liabilities balances for the periods indicated.

	Contract Asset	Contract Liability	Net Deferred Revenue
December 31, 2020	$ 4,843	$ 16,071	$ 11,228
December 31, 2021	$ —	$ 13,251	$ 13,251

	Short-term Deferred Revenue	Long-term Deferred Revenue	Net Deferred Revenue
December 31, 2020	$ 2,990	$ 8,238	$ 11,228
December 31, 2021	$ 2,586	$ 10,665	$ 13,251

The Company has recorded the Sato Agreement and Amended Sato Agreement transaction price, including the upfront payments received and the unconstrained variable consideration, as deferred revenue (comprised of (i) a contract liability; net of (ii) a contract asset).

The change in the net deferred revenue balance during the year ended December 31, 2021 was associated with (i) the recognition of license and collaboration revenue associated with the Company's performance during the period (continued

amortization of deferred revenue); (ii) the impact of foreign currency exchange rate fluctuations; and (iii) a time-based developmental milestone payment that became due and payable as of December 31, 2021. This time-based milestone payment represented a contract asset as of December 31, 2020 where as of December 31, 2021 the Company had an unconditional right to receive consideration of $4,345, based upon the passage of time. Therefore, as of December 31, 2021, the Company presented this milestone payment in contracts and grants receivable within its consolidated balance sheets.

During the years ended December 31, 2021 and 2020, the Company recognized $2,822 and $4,208, respectively, in license and collaboration revenue under this agreement. During the year ended December 31, 2021, the Company recognized expense of $500 related to foreign currency adjustments related to the contract asset, presented within other (expense) income, net within the accompanying consolidated statements of operations and comprehensive loss.

The Company has concluded that the above consideration is probable of not resulting in a significant revenue reversal and therefore included in the transaction price and is allocated to the single performance obligation. No other variable consideration under the Amended Sato Agreement is probable of not resulting in a significant revenue reversal as of December 31, 2021 and therefore, is currently fully constrained and excluded from the transaction price.

The Company evaluated the timing of delivery for its performance obligation and concluded that a time-based input method is most appropriate because Sato is accessing and benefiting from the intellectual property and technology (the predominant items of the combined performance obligation) ratably over the duration of Sato's estimated development period in Japan. Although the Company concluded that the intellectual property is functional rather than symbolic, the services provided under the performance obligation are provided over time. Therefore, the allocated transaction price will be recognized using a time-based input method that results in straight-line recognition over the Company's performance period.

The Company monitors and reassesses the estimated performance period for purposes of revenue recognition during each reporting period. During the third quarter of 2020, Sato prepared, and the Company reviewed, an SB206 Japanese development program timeline that supported a 7.5 year performance period estimate completing in the third quarter of 2024. The SB204 Japanese development plan and program timeline was not presented by Sato and remains under evaluation by the Company and Sato. Currently, the Company understands that the progression of the Japanese SB204 program could follow the same timeline as the Japanese SB206 program, subject to the nature of the results of Sato's comprehensive asset developmental program, including SB206.

In November of 2020, Sato determined its initial Japanese Phase 1 study for SB206 would require an amended design, including evaluation of potential lower dose strengths, to further refine dose tolerability in a subsequent Phase 1 study. Based upon (i) the need for an additional Phase 1 study; (ii) Sato's estimated comprehensive developmental schedule for SB206, including additional post-Phase 1 clinical trials; and (iii) current and future Japanese clinical trial material manufacturing and technical transfer considerations, the Company concluded that a prospective delay in Sato's overall SB206 Japanese development plan had occurred. The Company estimated the program timeline to be extended by 1.75 years from its previous estimate, and a corresponding extension of the performance period estimate to 9.25 years, completing in the second quarter of 2026.

In late July 2021, Sato communicated an updated plan regarding its amended design for its additional Japanese Phase 1 study for SB206. The amended study design included evaluation of potential lower dose strengths, including potential further refinement in a subsequent dose tolerability study. As part of the communication regarding these Phase 1 studies, Sato also communicated an updated comprehensive timeline for the Japanese SB206 program. The updated timeline assumed that the 12% formulation is appropriate to proceed for development in Japan and is to be reassessed based on the findings of the Phase 1 study.

Based upon (i) the expected timing of the additional Phase 1 study, including a subsequent dose tolerability study; (ii) Sato's estimated comprehensive developmental schedule for SB206, including additional post-Phase 1 clinical trials; and (iii) current and future Japanese clinical trial material manufacturing and technical transfer considerations, including the manufacturing site for drug product, the Company concluded that a prospective delay in Sato's overall SB206 Japanese development plan had occurred. The Company estimated the program timeline to be extended by 0.75 years from its previous estimate, and a corresponding extension of the performance period estimate to 10 years, completing in the first quarter of 2027. The Company understands that the progression of the Japanese SB204 program could follow the same timeline as the Japanese SB206 program, subject to the nature of the results of Sato's comprehensive asset developmental program, including SB206.

The change in estimate related to the increase in the expected duration of the combined SB204 and SB206 development program timeline that occurred in July 2021 resulted in a decrease of $34 in monthly license and collaboration revenue, as compared to amounts that would have been recorded under the previous timeline.

Based on the timing of this change in estimate, beginning in the third quarter of 2021, the Company recognized a lower amount of license and collaboration revenue, as compared to the first and second quarter of 2021. Prospective periods will reflect the impact of this change in estimate that occurred in July 2021, as compared to the previous timeline, based on the current timeline and the effective difference in monthly revenue recognized under the Amended Sato Agreement.

The estimated timeline remains subject to prospective reassessment and adjustment based upon Sato's interaction with the Japanese regulatory authorities and other developmental and timing considerations. The combined SB204 and SB206 development program timeline in Japan is continuously reevaluated by Sato and the Company, and may potentially be further affected by various factors, including: (i) the analyses, assessments and decisions made by the joint development committee and the applicable regulatory authorities, which will influence and establish the combined SB204 and SB206 Japan development program plan; (ii) the remaining timeline and progression of the SB206 NDA submission in the United States, which has been and may be further impacted by the COVID-19 pandemic; (iii) the API and drug product supply chain progression, including the Company's in-house drug manufacturing capabilities; (iv) the Company's manufacturing technology transfer projects with third-party CMOs; and (v) a drug delivery device technology enhancement project with a technology manufacturing vendor.

If the duration of the combined SB204 and SB206 development program timeline is further affected by the establishment or subsequent adjustments to, as applicable, the mutually agreed upon SB204 and SB206 development plan in the Japan territory, the Company will adjust its estimated performance period for revenue recognition purposes accordingly, as needed.

Contract Costs—Amended Sato Agreement

The Company has incurred certain fees and costs in the process of obtaining the Amended Sato Agreement that were payable upon contract execution and, therefore, have been recognized as other assets and amortized as general and administrative expense on a straight-line basis over the same estimated performance period being used to recognize the associated revenue. These fees are associated with the following two arrangements and are described as follows:

- The Company entered into an agreement with a third party to assist the Company in exploring the licensing opportunity that led to the execution of the Sato Agreement. The Company is obligated to pay the third party a low-single-digit percentage of all upfront and milestone payments the Company receives from Sato under the Amended Sato Agreement.
- The intellectual property rights granted to Sato under the Amended Sato Agreement include certain intellectual property rights which the Company has licensed from UNC. Under the UNC License Agreement described in Note 3—Research and Development Licenses, the Company is obligated to pay UNC a running royalty percentage in the low single digits on net sales of licensed products, including net sales that may be generated by Sato. Additionally, the Company is obligated to make payments to UNC that represent the portion of the Sato upfront and milestone payments that were estimated to be directly attributable to the UNC intellectual property rights included in the license to Sato.

The Company has also accrued certain fees that it will pay to the third party and to UNC in the future upon receipt of non-contingent installment and milestone payments from Sato. As of December 31, 2021, the Company had recorded capitalized contract acquisition costs of $345 in prepaid expenses and other current assets and other assets, and had accrued $109 in the accompanying balance sheet. For the years ended December 31, 2021 and 2020, the Company paid fees totaling $115 and $0, respectively.

Performance Obligations under the Amended Sato Agreement

The net amount of existing performance obligations under long-term contracts unsatisfied as of December 31, 2021 was $13,251. The Company expects to recognize approximately 20% of the remaining performance obligations as revenue over the next 12 months, and the balance thereafter. The Company applied the practical expedient and does not disclose information about variable consideration related to sales-based or usage-based royalties promised in exchange for a license of intellectual property. This expedient specifically applied to the sales-based milestone payments that are present in the Amended Sato Agreement (3.9 billion JPY), as well as percentage-based royalty payments in the Amended Sato Agreement that are contingent upon future sales.

Government Contracts and Grant Revenue

The Company assessed the following federal grants in accordance with Topic 958 and concluded that both represent conditional non-exchange transactions.

In August 2019, the Company received a Phase 1 federal grant of approximately $223 (the "NIH Phase 1 Grant") from the National Institutes of Health (the "NIH"). The funds are to be used to advance formulation development of a nitric oxide-containing intravaginal gel (WH602) designed to treat high-risk human papilloma virus ("HPV") infections that can lead to cervical intraepithelial neoplasia ("CIN"). The specific focus is to ensure the nitric oxide delivery from the gel replicates doses of nitric oxide previously demonstrated to be effective against HPV in the Company's clinical and *in vitro* studies. Revenue recognized under the NIH Phase 1 Grant was $0 and $29 during the years ended December 31, 2021 and 2020, respectively.

In February 2020, following the successful progression of the NIH Phase 1 Grant, the Company was awarded a Phase 2 federal grant of approximately $997 from the NIH (the "NIH Phase 2 Grant") that will enable the conduct of IND-enabling toxicology and pharmacology studies and other preclinical activity with respect to WH602. The NIH Phase 2 Grant funds will be received by the Company in the form of periodic cost reimbursements as the underlying research and development activities are performed. The Company may be eligible to receive additional funding as part of the NIH Phase 2 Grant, subject to availability of NIH funds and satisfactory progress of the project during the initial 12-month term. Revenue recognized under the NIH Phase 2 Grant was $126 and $168 during the years ended December 31, 2021 and 2020, respectively.

In September 2019, the Company received a grant from the United States Department of Defense's Congressionally Directed Medical Research Programs of approximately $1,113 as part of its Peer Reviewed Cancer Research Program. The grant supports the development of a non-gel formulation product candidate (WH504) designed to treat high-risk HPV infections that can lead to CIN, with well-characterized physical chemical properties suitable for intravaginal administration. In addition, the grant supports the evaluation of the effect of varying concentrations and treatment durations of berdazimer sodium (NVN1000) against HPV-18 in human raft cell culture *in vitro* studies. Revenue recognized under this grant was $10 and $515 during the years ended December 31, 2021 and 2020, respectively.

Note 6: Research and Development Arrangements

Royalty and Milestone Payments Purchase Agreement with Reedy Creek Investments LLC

On April 29, 2019, the Company entered into a royalty and milestone payments purchase agreement (the "Purchase Agreement") with Reedy Creek Investments LLC ("Reedy Creek"), pursuant to which Reedy Creek provided funding to the Company in an initial amount of $25,000, for the Company to use primarily to pursue the development, regulatory approval and commercialization (including through out-license agreements and other third-party arrangements) activities for SB206, a topical gel with anti-viral properties being developed as a treatment for molluscum contagiosum, and advancing programmatically such activities with respect to SB204, a once-daily, topical monotherapy being developed for the treatment of acne vulgaris, and SB414, a topical cream-based product candidate being developed for the treatment of atopic dermatitis.

Pursuant to the Purchase Agreement, the Company will pay Reedy Creek ongoing quarterly payments, calculated based on an applicable percentage per product of any upfront fees, milestone payments, royalty payments or equivalent payments received by the Company pursuant to any out-license agreement for SB204, SB206 or SB414 in the United States, Mexico or Canada, net of any upfront fees, milestone payments, royalty payments or equivalent payments paid by the Company to third parties pursuant to any agreements under which the Company has in-licensed intellectual property with respect to such products in the United States, Mexico or Canada. The applicable percentage used for determining the ongoing quarterly payments, applied to amounts received directly by the Company pursuant to any out-license agreement for each product, ranges from 10% for SB206 to 20% for SB204 and SB414. However, the agreement provides that the applicable percentage for each product will be 25% for fees or milestone payments received by the Company (but not royalty payments received by the Company) until Reedy Creek has received payments under the Purchase Agreement equal to the total funding amount provided by Reedy Creek under the Purchase Agreement. If the Company decides to commercialize any product on its own following regulatory approval, as opposed to commercializing through an out-license agreement or other third-party arrangement, the Company will only be obligated to pay Reedy Creek a low single digits royalty on net sales of such products.

The Company determined that the Reedy Creek Purchase Agreement is within the scope of ASC 730-20, *Research and Development Arrangements*. The Company concluded that there has not been a substantive and genuine transfer of risk related to the Purchase Agreement as (i) Reedy Creek has the opportunity to recover its investment regardless of the outcome of the research and development programs within the scope of the agreement (prior to commercialization of any in scope assets through potential out-licensing agreements and related potential future milestone payments); and (ii) there is a presumption that the Company is obligated to pay Reedy Creek amounts equal to its investment based on the related party relationship at the time the parties entered into the Purchase Agreement. The Purchase Agreement is a broad funding arrangement, due to (i) the multi-asset, or portfolio approach including three developmental assets that are within the scope of the arrangement; and (ii) Reedy Creek's approximate 5% ownership of the outstanding shares of common stock of the Company at the time of entry into the Purchase Agreement.

As such, the Company determined that the appropriate accounting treatment under ASC 730-20 was to record the initial proceeds of $25,000 as cash and cash equivalents, as the Company had the ability to direct the usage of funds, and a long-term liability within its classified balance sheet. The long-term liability will remain until the Company receives future milestones from other potential third parties, as defined within the Purchase Agreement, of which 25% will be contractually owed to Reedy Creek. If potential future milestones or other payments are received by the Company, and become partly due to Reedy Creek, the corresponding partial repayment to Reedy Creek will result in a ratable reduction of the total long-term obligation to repay the initial purchase price.

Development Funding and Royalties Agreement with Ligand Pharmaceuticals Incorporated

On May 4, 2019, the Company entered into a development funding and royalties agreement (the "Funding Agreement") with Ligand Pharmaceuticals Incorporated ("Ligand"), pursuant to which Ligand provided funding to the Company of $12,000, for the Company to use to pursue the development and regulatory approval of SB206, a topical gel with anti-viral properties being developed as a treatment for molluscum contagiosum.

Pursuant to the Funding Agreement, the Company will pay Ligand up to $20,000 in milestone payments upon the achievement by the Company of certain regulatory and commercial milestones associated with SB206 or any product that incorporates or uses NVN1000, the API for the Company's clinical stage product candidates, as a treatment for molluscum contagiosum. In addition to the milestone payments, the Company will pay Ligand tiered royalties ranging from 7% to 10% based on annual aggregate net sales of such products in the United States, Mexico or Canada.

The Company determined that the Ligand transaction is within the scope of ASC 730-20 as it represents an obligation to perform contractual services for the development of SB206 using commercially reasonable efforts. In addition, the Funding Agreement also states that if all development of SB206 is ceased prior to the first regulatory approval, the Company must pay to Ligand an amount equal to the purchase price less the amount spent in accordance with the development budget on development activities conducted prior to such cessation.

As such, the Company concluded that the appropriate accounting treatment under ASC 730-20 was to record the initial proceeds of $12,000, as a liability and as restricted cash on its consolidated balance sheet, as the funds could only be used for the progression of SB206.

The Company amortizes the liability ratably during each reporting period, based on the Ligand funding as a percentage of the total direct costs incurred by the Company during the reporting period related to the estimated total cost to progress the SB206 program to a regulatory approval in the United States. The ratable Ligand funding is presented within the accompanying consolidated statements of operations and comprehensive loss within research and development expenses associated with the SB206 program. During the three months ended June 30, 2020, the Company completed a reassessment of the estimated total cost to progress the SB206 program to a potential United States regulatory approval, including consideration of how such estimated costs may potentially be affected by various regulatory, clinical development, and drug manufacturing and supply factors. During this reassessment, the Company concluded that the incremental costs associated with the conduct of the B-SIMPLE4 Phase 3 trial would be excluded from the total cost basis used to amortize the liability because they were not contemplated within the Funding Agreement. The reassessment also concluded that the other projected costs to progress SB206 to a planned regulatory approval in the United States, most of which are regulatory costs associated with the NDA submission process, did not materially change and did not have a material effect on the amortization of the liability.

The initial restricted cash balance was also reduced ratably during interim reporting periods in 2019 in a manner consistent with the amortization method for the Ligand funding liability balance. As of December 31, 2019, the aggregate amount spent in accordance with the SB206 development budget on SB206 development activities had exceeded the $12,000 purchase price, causing the aforementioned repayment provision provided for in the Funding Agreement to no longer be enforceable. Therefore, the Company reported no restricted cash balance related to the Funding Agreement, as of December 31, 2021 or 2020 in its accompanying consolidated balance sheets.

For the years ended December 31, 2021 and 2020, the Company recorded $88 and $2,179 of amortization, respectively, within contra-research and development expense related to the SB206 developmental program, funded by Ligand. During the year ended December 31, 2021, after the announcement of the B-SIMPLE4 positive top-line results on June 11, 2021, the Company reassessed and identified additional estimated costs necessary to progress the SB206 program to a potential United States regulatory approval. As such, the estimated regulatory costs subject to the Ligand funding have increased from prior periods. The Company will continue to monitor and adjust its estimated regulatory costs, through approval, as needed.

Note 7: Property and Equipment, Net

Property and equipment consisted of the following:

	December 31,	
	2021	2020
Computer equipment	$ 58	$ 67
Furniture and fixtures	23	34
Laboratory equipment	4,134	2,930
Office equipment	177	72
Leasehold improvements	9,391	562
Property and equipment, gross	13,783	3,665
Less: Accumulated depreciation and amortization	(1,582)	(1,259)
Total property and equipment, net	$ 12,201	$ 2,406

Depreciation and amortization expense was $344 and $1,170 for the years ended December 31, 2021 and 2020, respectively.

For the years ended December 31, 2021 and 2020, the Company had construction in progress amounts related to leasehold improvements of $7,485 and $562, respectively.

New Facility

As of December 31, 2021 and 2020, the Company had goods and services associated with the planning, design and build-out of its new facility of $451 and $17, respectively, included in accounts payable and $1,020 and $365, respectively, included in other accrued expenses in other current liabilities in the accompanying consolidated financial statements.

See Note 8—Commitments and Contingencies for details regarding the new facility and related lease.

Previous Facility Lease

During the second quarter of 2020, the Company met the relevant criteria for reporting certain property and equipment related to its previous facility as held for sale on June 29, 2020, and as a result, the Company stopped recording depreciation expense on that date, assessed the property and equipment assets for impairment pursuant to FASB Topic 360, Property, Plant, and Equipment, and reclassified the remaining carrying value of the assets held for sale as current assets in its consolidated balance sheets as of June 30, 2020.

Certain events and transactions occurred during the third quarter of 2020 that resulted in the disposition of assets and liabilities within the Company's various disposal and asset groups, including the disposition of all assets and liabilities within the Company's previous facility asset group on July 16, 2020 in conjunction with a lease termination transaction.

See Note 8—Commitments and Contingencies for further discussion regarding the previous facility lease termination transaction.

See Note 16—Assets Held for Sale, Impairment Charges for discussion regarding the impairments to property and equipment, net related to the previous facility lease.

See Note 17—Asset Group Disposition for further discussion related to the disposal of previous facility lease assets.

Note 8: Commitments and Contingencies

Lease Obligations

The Company leases office space and certain equipment under non-cancelable lease agreements.

In accordance with ASC 842, *Leases* (Topic 842), arrangements meeting the definition of a lease are classified as operating or financing leases and are recorded on the balance sheet as both a right-of-use asset and lease liability, calculated by discounting fixed lease payments over the lease term at the rate implicit in the lease, if available, otherwise at the Company's incremental borrowing rate. For operating leases, interest on the lease liability and the amortization of the right-of-use asset result in straight-line rent expense over the lease term. Variable lease expenses, if any, are recorded when incurred.

In calculating the right-of-use asset and lease liability, the Company elected, and has in practice, historically combined lease and non-lease components. The Company excludes short-term leases having initial terms of 12 months or less from the guidance as an accounting policy election and recognizes rent expense on a straight-line basis over the lease term.

Previous Facility Lease - Hopson Road, Morrisville, North Carolina

In August 2015, the Company entered into a lease agreement for approximately 51,000 rentable square feet of facility space in Morrisville, North Carolina, commencing in April 2016 (the "Previous Facility Lease"). The initial term of the Previous Facility Lease extended through June 30, 2026. The Company had an option to extend the Previous Facility Lease by five years upon completion of the initial lease term, however, the renewal period was not included in the calculation of the lease obligation. As of June 30, 2020, the Company had approximately $7,900 in remaining minimum lease payments under the Previous Facility Lease.

On July 16, 2020, the Company entered into a Lease Termination Agreement (the "Termination Agreement") with Durham Hopson, LLC (as successor-in-interest to Durham Hopson Road, LLC) (the "Landlord"), which provided for the early termination of the Previous Facility Lease, subject to certain conditions. Pursuant to the terms of the Termination Agreement, the Previous Facility Lease was terminated in connection with the Landlord entering into a lease with an unrelated third party (the "New Tenant") for the premises in the building covered by the Previous Facility Lease (the "New Tenant Lease"), which commenced on July 16, 2020.

As consideration for the early termination of the Previous Facility Lease pursuant to the Termination Agreement, the Company paid $600 to the Landlord, $539 of which was remitted through the Company's then existing security deposit under the Previous Facility Lease to the Landlord, and $61 of which was paid in cash. In addition, pursuant to the terms of a separate and stand-alone agreement between the Company and its real estate broker, the Company incurred a broker fee of $405 upon execution of the Termination Agreement. These costs directly associated with the execution of the Termination Agreement, which totaled $1,005 in aggregate, were included as part of the loss on disposition of the Company's facility asset group, as described in Note 16—Assets Held for Sale, Impairment Charges.

In connection with the termination of the Previous Facility Lease pursuant to the Termination Agreement, the Company entered into a sublease agreement, which was effective upon the termination of the Previous Facility Lease and the commencement of the New Tenant Lease, through which the Company began to sublease from the New Tenant approximately 12,000 square feet (reduced to approximately 10,000 square feet after August 31, 2020) in the building that was covered by the Previous Facility Lease (the "Sublease"). The New Tenant and the Landlord entering into the New Tenant Lease was a condition precedent to the effectiveness of the termination of the Previous Facility Lease pursuant to the Termination Agreement, and, in connection with the termination of the Previous Facility Lease, the Landlord consented to the Sublease. The Sublease expired on March 31, 2021.

The Company operated its corporate headquarters, research and development laboratories and pilot scale cGMP manufacturing activities within the Morrisville, North Carolina facility underlying the Previous Facility Lease (the "Previous Facility") pursuant to the Sublease during the first quarter of 2021, prior to taking possession of its New Facility, described below. However, the Company decommissioned the areas within the Previous Facility, as well as the associated equipment, that supported the Company's large scale cGMP drug manufacturing capability in preparation for execution of the Termination Agreement. The Company incurred an aggregate of approximately $300 during the year ended December 31, 2020 for these decommissioning, environmental remediation and other preparatory services to ready the Previous Facility for the execution of the Termination Agreement. These costs were included within research and development expenses in the accompanying consolidated statements of operations and comprehensive loss.

In connection with the execution of the Termination Agreement and the associated performance of decommissioning activities mentioned above, the Company evaluated its long-lived assets for impairment, principally its right of use lease asset and its property, plant and equipment, including leasehold improvements. See Note 16—Assets Held for Sale, Impairment Charges for a discussion of the Company's evaluation of its long-lived assets and the resulting impairment charges recorded during the year ended December 31, 2020. The Company also recorded an additional loss based upon Company-specific facts and circumstances associated with the July 2020 lease termination transaction during the year ended December 31, 2020. See Note 17—Asset Group Disposition for additional detail regarding the loss on the Company's facility asset group disposition.

In January 2021, the Company entered into a lease agreement for a location to serve as its new corporate headquarters and to support various cGMP activities, including research and development and small-scale manufacturing capabilities, described below.

New Facility Lease - Triangle Business Center, Durham, North Carolina

On January 18, 2021, the Company entered into a lease with an initial term expiring in 2032, as amended for 19,265 rentable square feet, located in Durham, North Carolina. This lease dated as of January 18, 2021, as amended (the "New Lease"), is by and between the Company and Copper II 2020, LLC ("New Landlord"), pursuant to which the Company is leasing space serving as its corporate headquarters and small-scale manufacturing site (the "New Facility" or "Premises") located within the Triangle Business Center. The lease executed on January 18, 2021, as amended, was further amended on November 23, 2021 to expand the Premises by approximately 3,642 additional rentable square feet from 15,623 rentable square feet.

The Premises serves as the Company's new corporate headquarters and has been and continues to be prepared to support various cGMP activities, including research and development and small-scale manufacturing capabilities. These capabilities include the infrastructure necessary to support small-scale drug substance manufacturing and the ability to act as a primary, or secondary backup, component of a potential future commercial supply chain.

The New Lease commenced on January 18, 2021 (the "Lease Commencement Date"). Rent under the New Lease commenced in October 2021 (the "Rent Commencement Date"). The term of the New Lease expires on the last day of the one hundred twenty-third calendar month after the Rent Commencement Date. The New Lease provides the Company with one option to extend the term of the New Lease for a period of five years, which would commence upon the expiration of the original term of the New Lease, with base rent of a market rate determined according to the New Lease; however, the renewal period was not included in the calculation of the lease obligation as the Company determined it was not reasonably certain to exercise the renewal option.

The monthly base rent for the Premises is approximately $40 for months 1-10 and approximately $49 for months 11-12, per the second amendment to the primary lease. Beginning with month 13 and annually thereafter, the monthly base rent will be increased by 3%. Subject to certain terms, the New Lease provides that base rent will be abated for three months following the Rent Commencement Date. The Company is obligated to pay its pro-rata portion of taxes and operating expenses for the building as well as maintenance and insurance for the Premises, all as provided for in the New Lease.

The New Landlord has agreed to provide the Company with a tenant improvement allowance in an amount not to exceed $130 per rentable square foot, totaling approximately $2,031, per the primary lease, inclusive of the first amendment, and $115 per rentable square foot, totaling $419, per the second amendment to the primary lease. The tenant improvement allowance will be paid over four equal installments corresponding with work performed by the Company. Pursuant to the terms of the New Lease, the Company delivered to the New Landlord a letter of credit in the amount of $583 as collateral for the full performance by the Company of all of its obligations under the New Lease and for all losses and damages the New Landlord may suffer as a result of any default by the Company under the New Lease. Cash funds maintained in a separate deposit account at the Company's financial institution to fully secure the letter of credit are presented as restricted cash in non-current assets on the accompanying consolidated balance sheets.

Rent expense, including both short-term and variable lease components associated with the Previous Facility Lease, Sublease, and the New Lease was $467 and $550 for the years ended December 31, 2021 and 2020, respectively. Rent expense for leases less than one year in duration was $539 and $266 for the years ended December 31, 2021 and 2020, respectively.

The weighted average remaining lease term for the New Lease and weighted average discount rate for the New Lease are 10.17 years and 8.35%, respectively, as of December 31, 2021.

Future minimum lease payments, net of amounts expected to be received related to the tenant improvement allowance, as of December 31, 2021 were as follows:

Maturity of Lease Liabilities	Operating Lease
2022	$ (448)
2023	608
2024	626
2025	645
2026	665
2027 and beyond	3,700
Total future undiscounted lease payments	$ 5,796
Add: reclassification of discounted net cash inflows to other current assets	$ 109
Less: imputed interest	$ (2,292)
Total reported lease liability	$ 3,613

The table above reflects payments for an operating lease with a remaining term of one year or more, but does not include obligations for short-term leases. In addition, the net cash inflow related to the 2022 fiscal year presented above relates to the expected timing of the remaining tenant improvement allowance totaling $2,450 being funded by the New Landlord, which the Company reasonably expects to receive within the next twelve months, partially offset by expected lease payments for the corresponding period. During the year ended December 31, 2021, the Company received $1,523 related to payments as part of the total New Landlord funded tenant improvement allowance.

Components of lease assets and liabilities as of December 31, 2021 were as follows:

	As of December 31, 2021
Leases	
Assets	
Other current asset related to leasing arrangement, net	$ 109
Right-of-use lease assets	1,693
Total assets	$ 1,802
Liabilities	
Noncurrent operating lease liabilities	$ 3,613
Total lease liabilities	$ 3,613

The effective discounted value of the remaining tenant improvement allowance payments, of the total tenant improvement allowance of $2,450 being funded by the New Landlord, partially offset by the expected lease payments by the Company within the next twelve months results in a net balance of $109. This net amount is presented within the consolidated balance sheets as other current asset related to leasing arrangement, net as of December 31, 2021. Furthermore, this amount is also included in long-term lease liabilities within the consolidated balance sheets as of December 31, 2021.

Contingencies

From time to time, the Company may have certain contingent liabilities that arise in the ordinary course of business activities. The Company accrues a liability for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated. See *Legal Proceedings* below for further discussion of pending legal claims.

The Company has entered into, and expects to continue to enter into, contracts in the normal course of business with various third parties who support its clinical trials, preclinical research studies and other services related to its development activities, including drug substance and drug product manufacturing technical transfer capabilities, production and supportive costs. The scope of the services under these agreements can generally be modified at any time, and these agreements can generally be

terminated by either party after a period of notice and receipt of written notice. There have been no material contract terminations as of December 31, 2021.

As of December 31, 2021, the Company had accrued technical transfer capabilities and production costs of $1,072 related to external third-party CMOs included in other accrued expenses in other current liabilities in the accompanying consolidated financial statements. There were no accrued technical transfer capabilities and production costs in other accrued expenses in other current liabilities in the accompanying consolidated financial statements for the year ended December 31, 2020.

See Note 3—Research and Development Licenses regarding the Company's research and development license agreements.

See Note 6—Research and Development Arrangements regarding the Purchase Agreement with Reedy Creek and the Funding Agreement with Ligand.

See Note 10—Stockholders' Equity (Deficit) regarding outstanding warrants relating to the January 2018 Public Offering, the March 2020 Public Offering and the March 2020 Registered Direct Offering.

Development Services Agreement

In July 2021, the Company entered into a development services agreement with a third-party full-scale API manufacturer for certain manufacturing process feasibility services including process familiarization, safety assessments, preliminary engineering studies, and initial process and analytical methods determination. Following the successful completion of certain preliminary activities with this third-party API manufacturer and other preparatory activities, the Company would then plan to proceed with the third-party API manufacturer beyond the initial stages noted above, in which case the Company expects to incur substantial costs associated with technical transfer efforts, capital expenditures, manufacturing capabilities, and certain quantities of its drug substance.

Legal Proceedings

The Company is not currently a party to any material legal proceedings and is not aware of any claims or actions pending against the Company that the Company believes could have a material adverse effect on the Company's business, operating results, cash flows or financial statements. In the future, the Company might from time to time become involved in litigation relating to claims arising from its ordinary course of business.

Compensatory Obligations

See Note 11—Stock-Based Compensation regarding the Stock Appreciation Rights granted in January 2020.

See Note 12—Tangible Stockholder Return Plan regarding the Tangible Stockholder Return Plan adopted in August 2018.

Note 9: Paycheck Protection Program

On April 22, 2020, the Company entered into a promissory note, which was subsequently amended (the "Note"), evidencing an unsecured loan in the amount of approximately $956 made to the Company (the "Loan") under the Paycheck Protection Program (the "PPP"). The PPP was established under the Coronavirus Aid, Relief, and Economic Security Act (the "CARES Act") and is administered by the United States Small Business Administration (the "SBA"). The Loan was made through PNC Bank, National Association. Subject to the terms of the Note, the Loan's interest rate was fixed at one percent (1%) per annum.

Under the terms of the CARES Act, PPP loan recipients can apply for and be granted forgiveness for all or a portion of loans granted under the PPP, with such forgiveness to be determined, subject to limitations, based on the use of loan proceeds for payment of permitted and program-eligible expenses. Interest payable on the Note may be forgiven only if the SBA agrees to pay such interest on the forgiven principal amount of the Note.

The Company previously applied for and during the second quarter of 2021 received notification of forgiveness of the entire loan balance, including any accrued interest. Based upon the Notice of Paycheck Protection Program Forgiveness Payment received by the Company from the SBA, as of June 14, 2021, the forgiveness of the principal balance of $956 is presented within the consolidated statements of operations and comprehensive loss as a gain on debt extinguishment.

Note 10: Stockholders' Equity (Deficit)

Capital Structure

In conjunction with the completion of the Company's initial public offering in September 2016, the Company amended its restated certificate of incorporation and amended and restated its bylaws. The amendment provided for 210,000,000 authorized shares of capital stock, of which 200,000,000 shares are designated as $0.0001 par value common stock and 10,000,000 shares are designated as $0.0001 par value preferred stock.

At the Company's Annual Meeting of Stockholders held on July 28, 2020 (the "2020 Annual Meeting"), the Company's stockholders approved an amendment to the Company's restated certificate of incorporation of the Company to effect a reverse stock split of the Company's common stock at a ratio of not less than one-for-two and not more than one-for-fifteen, with such ratio and the implementation and timing of such reverse stock split to be determined by the Company's board of directors in its sole discretion. On May 18, 2021, the Company's board of directors approved a one-for-ten reverse stock split of the Company's issued and outstanding common stock. On May 24, 2021, the Company filed with the Secretary of State of the State of Delaware a Certificate of Amendment to the Restated Certification of Incorporation of the Company in order to effect the Reverse Stock Split. The Reverse Stock Split became effective as of 5:00 p.m. Eastern Time on May 25, 2021, and the Company's common stock began trading on a split-adjusted basis on May 26, 2021. As a result of the Reverse Stock Split, on the effective date thereof, each outstanding ten (10) shares of common stock combined into and became one (1) share of common stock, and the number of the Company's issued and outstanding shares of common stock was reduced to 15,170,678. The accompanying consolidated financial statements and related notes give retroactive effect to the Reverse Stock Split.

June 2021 Public Offering

On June 17, 2021, the Company entered into an underwriting agreement with Cantor Fitzgerald & Co., as underwriter, pursuant to which the Company agreed to issue and sell an aggregate of 3,636,364 shares of the Company's common stock at a price to the public of $11.00 per share, less underwriting discounts and commissions. The Company also granted the underwriter a 30-day option (the "Underwriter Option") to purchase up to an additional 545,454 shares of common stock at the public offering price, less underwriting discounts and commissions. The June 2021 Public Offering closed on June 21, 2021, and the Underwriter Option expired unexercised in July 2021.

Net proceeds from the June 2021 Public Offering were approximately $37,236 after deducting underwriting discounts and commissions and offering expenses of approximately $2,764. Offering costs were netted against the offering proceeds and recorded to additional paid-in capital.

The June 2021 Public Offering was made pursuant to the Company's effective shelf registration statement on Form S-3 (No. 333-236583), filed with the Securities and Exchange Commission ("SEC") and declared effective by the SEC on April 10, 2020, including a prospectus contained therein dated as of April 10, 2020, as supplemented by a prospectus supplement, dated June 17, 2021.

March 2020 Public Offering

On February 27, 2020, the Company entered into an underwriting agreement with H.C. Wainwright, as underwriter, relating to the offering, issuance and sale of 1,400,000 shares of common stock, pre-funded warrants to purchase 433,333 shares of common stock (the "CMPO Pre-Funded Warrants"), and accompanying common warrants to purchase up to an aggregate of 1,833,333 shares of common stock (the "firm warrants"). The Company also granted H.C. Wainwright, as underwriter, a 30-day option to purchase up to 275,000 additional shares of common stock and/or common warrants to purchase up to an aggregate of 275,000 shares of common stock, which H.C. Wainwright partially exercised on March 2, 2020 to purchase 149,860 shares of common stock and common warrants to purchase 275,000 shares of common stock (the "option warrants," and together with the firm warrants, the "CMPO Common Warrants"). The combined price to the public in this offering for each share of common stock and accompanying common warrants was $3.00, and the combined price to the public in this offering for each pre-funded warrant and accompanying common warrant was $2.999. The March 2020 Public Offering closed on March 3, 2020. At closing, the Company also issued to designees of H.C. Wainwright, as underwriter, warrants to purchase an aggregate of up to 59,496 shares of common stock (the "CMPO UW Warrants") representing 3.0% of the aggregate number of shares of common stock sold and shares of common stock underlying the pre-funded warrants sold in the March 2020 Public Offering. Net proceeds from the offering were approximately $5,158 after deducting underwriting discounts and commissions and offering expenses of approximately $791. Offering costs were netted against the offering proceeds and recorded to additional paid-in capital.

During the first quarter of 2020, all of the CMPO Pre-Funded Warrants were exercised in full, such that there were no more of the CMPO Pre-Funded Warrants outstanding as of March 31, 2020. The CMPO Pre-Funded Warrants had an exercise price of $0.001 per share.

The CMPO Common Warrants have an exercise price of $3.00 per share and expire five years from the date of issuance. The CMPO UW Warrants have an exercise price of $3.75 per share and expire five years from the date of issuance.

For the years ended December 31, 2021 and 2020, respectively, warrant holders exercised (i) a total of 10,000 and 1,845,917 CMPO Common Warrants, and (ii) 48,192 and none of the CMPO UW Warrants. As of December 31, 2021, there were 252,417 CMPO Common Warrants and 11,304 CMPO UW Warrants outstanding.

Common warrants and underwriter warrants. The CMPO Common Warrants and CMPO UW Warrants include certain provisions that establish warrant holder settlement rights that take effect upon the occurrence of certain fundamental transactions. The CMPO Common Warrants and the CMPO UW Warrants define a fundamental transaction to generally include any consolidation, merger or other transaction whereby another entity acquires more than 50% of the Company's outstanding common stock or the sale of all or substantially all of the Company's assets. The fundamental transaction provision provides the warrant holders with the option to settle any unexercised warrants for cash in the event of certain fundamental transactions that are within the control of the Company. For any fundamental transaction that is not within the control of the Company, including a fundamental transaction not approved by the Company's board of directors, the warrant holder will only be entitled to receive from the Company or any successor entity the same type or form of consideration (and in the same proportion) that is being offered and paid to the stockholders of the Company in connection with the fundamental transaction, whether that consideration be in the form of cash, stock or any combination thereof. In the event of any fundamental transaction, and regardless of whether it is within the control of the Company, the settlement amount of the CMPO Common Warrants and the CMPO UW Warrants (whether in cash, stock or a combination thereof) is determined based upon a Black-Scholes value that is calculated using inputs as specified in the CMPO Common Warrants and the CMPO UW Warrants, including a defined volatility input equal to the greater of the Company's 100-day historical volatility or 100%.

The CMPO Common Warrants and CMPO UW Warrants also include a separate provision whereby the exercisability of such warrants may be limited if, upon exercise, the warrant holder or any of its affiliates would beneficially own more than 4.99% (or an amount up to 9.99% if the holder so elects) of the Company's common stock.

The Company assessed the CMPO Common Warrants and the CMPO UW Warrants for appropriate equity or liability classification pursuant to the Company's accounting policy described in Note 1—Organization and Significant Accounting Policies. During this assessment, the Company determined (i) the CMPO Common Warrants and the CMPO UW Warrants did not constitute a liability under ASC 480; (ii) the CMPO Common Warrants and the CMPO UW Warrants met the definition of a derivative under ASC 815; (iii) the warrant holder's option to receive a net cash settlement payment under the CMPO Common Warrants and the CMPO UW Warrants only becomes exercisable upon the occurrence of certain specified fundamental transactions that are within the control of the Company; (iv) upon the occurrence of a fundamental transaction that is not within the control of the Company, the warrant holder would receive the same type or form of consideration offered and paid to common stockholders; (v) the CMPO Common Warrants and the CMPO UW Warrants are indexed to the Company's common stock; and (vi) the CMPO Common Warrants and the CMPO UW Warrants met all other conditions for equity classification under ASC 480 and ASC 815. Based on the results of this assessment, the Company concluded that the CMPO Common Warrants and the CMPO UW Warrants are freestanding equity-linked derivative instruments that met the criteria for the own-equity scope exception to derivative accounting under ASC 815. Accordingly, the CMPO Common Warrants and the CMPO UW Warrants were classified as equity and were accounted for as a component of additional paid-in capital at the time of issuance.

Pre-funded warrants. The CMPO Pre-Funded Warrants' fundamental transaction provision did not provide the warrant holders with the option to settle any unexercised warrants for cash in the event of any fundamental transactions; rather, in all fundamental transaction scenarios, the warrant holder was only entitled to receive from the Company or any successor entity the same type or form of consideration (and in the same proportion) that was being offered and paid to the stockholders of the Company in connection with the fundamental transaction, whether that consideration be in the form of cash, stock or any combination thereof. The CMPO Pre-Funded Warrants also included a separate provision whereby the exercisability of the warrants could be limited if, upon exercise, the warrant holder or any of its affiliates would beneficially own more than 4.99% (or an amount up to 9.99% if the holder so elects) of the Company's common stock.

The Company assessed the CMPO Pre-Funded Warrants for appropriate equity or liability classification pursuant to the Company's accounting policy described in Note 1—Organization and Significant Accounting Policies. During this assessment, the Company determined the CMPO Pre-Funded Warrants were freestanding instruments that did not meet the definition of a

liability pursuant to ASC 480 and did not meet the definition of a derivative pursuant to ASC 815. The CMPO Pre-Funded Warrants were indexed to the Company's common stock and met all other conditions for equity classification under ASC 480 and ASC 815. Based on the results of this assessment, the Company concluded that the CMPO Pre-Funded Warrants were freestanding equity-linked financial instruments that met the criteria for equity classification under ASC 480 and ASC 815. Accordingly, the CMPO Pre-Funded Warrants were classified as equity and were accounted for as a component of additional paid-in capital at the time of issuance.

March 2020 Registered Direct Offering

On March 24, 2020, the Company entered into a securities purchase agreement with several institutional and accredited investors, pursuant to which the Company agreed to sell and issue, in a registered direct offering priced at the market, an aggregate of 1,055,000 shares of the Company's common stock and pre-funded warrants to purchase 805,465 shares of common stock (the "RDO Pre-Funded Warrants"). The purchase price for each share of common stock was $4.30, and the price for each pre-funded warrant was $4.299. The March 2020 Registered Direct Offering closed on March 26, 2020. At closing, the Company also issued to designees of H.C. Wainwright, as placement agent, warrants to purchase an aggregate of up to 55,814 shares of common stock (the "RDO PA Warrants") representing 3.0% of the aggregate number of shares of common stock sold and shares of common stock underlying the pre-funded warrants sold in the March 2020 Registered Direct Offering. Net proceeds from the offering were approximately $7,225 after deducting fees and commissions and offering expenses of approximately $774. Offering costs were netted against the offering proceeds and recorded to additional paid-in capital.

During the first six months of 2020, all of the RDO Pre-Funded Warrants were exercised in full, such that there were no more of the RDO Pre-Funded Warrants outstanding as of June 30, 2020. The RDO Pre-Funded Warrants had an exercise price of $0.001 per share.

The RDO PA Warrants have an exercise price of $5.375 per share and expire five years from the date of issuance. For the years ended December 31, 2021 and 2020, respectively, warrant holders exercised a total of 45,209 and none of the RDO PA Warrants. As of December 31, 2021, there were 10,605 RDO PA Warrants outstanding.

Placement agent warrants. The RDO PA Warrants contain substantially similar terms as the CMPO UW Warrants, including fundamental transaction settlement provisions. The Company conducted an assessment of the RDO PA Warrants for appropriate equity or liability classification pursuant to the Company's accounting policy described in Note 1—Organization and Significant Accounting Policies. The Company reached the same determinations as described above for the CMPO UW Warrants, and the Company concluded that the RDO PA Warrants are freestanding equity-linked derivative instruments that met the criteria for the own-equity scope exception to derivative accounting under ASC 815. Accordingly, the RDO PA Warrants were classified as equity and were accounted for as a component of additional paid-in capital at the time of issuance.

Pre-funded warrants. The RDO Pre-Funded Warrants contained substantially similar terms as the CMPO Pre-Funded Warrants, including fundamental transaction settlement provisions that did not provide the warrant holders with the option to settle any unexercised warrants for cash in the event of any fundamental transactions; rather, in all fundamental transaction scenarios, the warrant holder was only entitled to receive from the Company or any successor entity the same type or form of consideration (and in the same proportion) that is being offered and paid to the stockholders of the Company in connection with the fundamental transaction, whether that consideration be in the form of cash, stock or any combination thereof. The Company conducted an assessment of the RDO Pre-Funded Warrants for appropriate equity or liability classification pursuant to the Company's accounting policy described in Note 1—Organization and Significant Accounting Policies. The Company reached the same determinations as described above for the CMPO Pre-Funded Warrants, and the Company concluded that the RDO Pre-Funded Warrants were freestanding equity-linked financial instruments that met the criteria for equity classification under ASC 480 and ASC 815. Accordingly, the RDO Pre-Funded Warrants were classified as equity and were accounted for as a component of additional paid-in capital at the time of issuance.

January 2018 Offering

On January 9, 2018, the Company completed a public offering of its common stock and warrants pursuant to the Company's then-effective shelf registration statement (the "January 2018 Offering"), pursuant to which it sold an aggregate of 1,000,000 shares of common stock and warrants to purchase up to 1,000,000 shares of the Company's common stock at a public offering price of $38.00 per share of common stock and accompanying warrant. The warrant exercise price is $46.60 per share and will expire four years from the date of issuance. Net proceeds from the offering were approximately $35,194 after deducting underwriting discounts and commissions and offering expenses of approximately $2,806.

The warrants issued in the January 2018 Offering include certain provisions that establish certain warrant holder settlement rights that take effect upon the occurrence of certain fundamental transactions. The warrants define a fundamental transaction to generally include any consolidation or merger whereby another entity acquires more than 50% of the Company's outstanding common stock or the sale of all or substantially all of the Company's assets. The fundamental transaction provision provides the warrant holders with the option to settle any unexercised warrants for cash in the event of certain fundamental transactions that are within the control of the Company. For any fundamental transaction that is not within the control of the Company, including a fundamental transaction not approved by the Company's board of directors, the warrant holder will only be entitled to receive from the Company or any successor entity the same type or form of consideration (and in the same proportion) that is being offered and paid to the stockholders of the Company in connection with the fundamental transaction, whether that consideration be in the form of cash, stock or any combination thereof. In the event of any fundamental transaction, and regardless of whether it is within the control of the Company, the settlement amount of the warrants (whether in cash, stock or a combination thereof) is determined based upon a Black-Scholes value that is calculated using inputs as specified in the warrants, including a defined volatility input equal to the greater of the Company's 100-day historical volatility or 100%.

The warrants also include a provision whereby the exercisability of the warrants may be limited if, upon exercise, the warrant holder or any of its affiliates would beneficially own more than 4.99% (or an amount up to 9.99% if the holder so elects) of the Company's common stock. The warrants also provide that this exercise limitation provision is not applicable to any warrant holder that beneficially owns 10.0% or more of the Company's outstanding common stock immediately following the closing of the January 2018 Offering and the issuance of the accompanying warrants.

There were exercises of 150 warrants issued in the January 2018 Offering during the year ended December 31, 2021. There were no exercises of warrants issued in the January 2018 Offering during the year ended December 31, 2020.

The Company assessed the warrants for appropriate equity or liability classification pursuant to the Company's accounting policy described in Note 1—Organization and Significant Accounting Policies. During this assessment, the Company determined that (i) the warrants did not constitute a liability under ASC 480; (ii) the warrants met the definition of a derivative under ASC 815; (iii) the warrant holder's option to receive a net cash settlement payment only becomes exercisable upon the occurrence of certain specified fundamental transactions that are within the control of the Company; (iv) upon the occurrence of a fundamental transaction that is not within the control of the Company, the warrant holder would receive the same type or form of consideration offered and paid to common stockholders; (v) the warrants are indexed to the Company's common stock; and (vi) the warrants met all other conditions for equity classification under ASC 480 and ASC 815.

Based on the results of this assessment, the Company concluded that the warrants issued in January 2018 are freestanding equity-linked derivative instruments that met the criteria for the own-equity scope exception to derivative accounting under ASC 815. Accordingly, the warrants were classified as equity and were accounted for as a component of additional paid-in capital at the time of issuance.

The following table presents the Company's outstanding warrants to purchase common stock for the periods indicated.

	December 31,		Exercise Price Per Share
	2021	2020	
Warrants to purchase common stock issued in the January 2018 Offering	999,850	1,000,000	$ 46.60
Warrants to purchase common stock issued in the March 2020 Public Offering	252,417	262,417	3.00
Underwriter warrants to purchase common stock associated with the March 2020 Public Offering	11,304	59,496	3.75
Placement agent warrants to purchase common stock issued in the March 2020 Registered Direct Offering	10,605	55,814	5.375
	1,274,176	1,377,727	

The weighted average exercise price per share for warrants outstanding as of December 31, 2021 and 2020 was $37.24 and $34.77, respectively. For the years ended December 31, 2021 and 2020, total proceeds from the exercise of warrants was $461 and $5,538, respectively.

Aspire Common Stock Purchase Agreements

July 2020 Aspire Common Stock Purchase Agreement

On July 21, 2020, the Company entered into the July 2020 Aspire CSPA, which provides that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital is committed to purchase up to an aggregate of $30,000 of shares of the Company's common stock at the Company's request from time to time during the 30-month term of the July 2020 Aspire CSPA. Upon execution of the July 2020 Aspire CSPA, the Company agreed to sell to Aspire Capital 555,555 shares of its common stock at $9.00 per share for proceeds of $5,000. In consideration for entering into the July 2020 Aspire CSPA, upon satisfaction of certain conditions under the July 2020 Aspire CSPA, the Company issued to Aspire Capital 100,000 shares of the Company's common stock (the "July 2020 Commitment Shares"). The July 2020 Commitment Shares, valued at approximately $847, were recorded in July 2020 as non-cash costs of equity financing and included within general and administrative expenses in the accompanying consolidated statements of operations and comprehensive loss. The July 2020 Aspire CSPA replaced the June 2020 Aspire CSPA, which was terminated under the terms of the July 2020 Aspire CSPA. See below for the terms of the June 2020 Aspire CSPA.

Concurrently with entering into the July 2020 Aspire CSPA, the Company also entered into a registration rights agreement with Aspire Capital, in which the Company agreed to file with the Securities and Exchange Commission (the "SEC") one or more registration statements, as necessary, and to the extent permissible and subject to certain exceptions, to register under the Securities Act of 1933, as amended (the "Securities Act"), the sale of the shares of the Company's common stock that may be issued to Aspire Capital under the July 2020 Aspire CSPA. On July 23, 2020, the Company filed with the SEC a prospectus supplement to the Company's effective shelf Registration Statement on Form S-3 (File No. 333-236583) registering all of the shares of common stock that may be offered to Aspire Capital from time to time.

Under the terms of the July 2020 Aspire CSPA, on any trading day selected by the Company, the Company has the right, in its sole discretion, to present Aspire Capital with a purchase notice (each, a "July 2020 Purchase Notice"), directing Aspire Capital (as principal) to purchase up to 30,000 shares of the Company's common stock per business day, up to an aggregate of $30,000 (including the initial purchase shares) of the Company's common stock in the aggregate at a per share price (the "July 2020 Purchase Price") equal to the lesser of (i) the lowest sale price of the Company's common stock on the purchase date; or (ii) the arithmetic average of the three (3) lowest closing sale prices for the Company's common stock during the ten (10) consecutive trading days ending on the trading day immediately preceding the purchase date. The aggregate purchase price payable by Aspire Capital on any one purchase date may not exceed $500, unless otherwise mutually agreed. The parties may mutually agree to increase the number of shares of the Company's common stock that may be purchased per trading day pursuant to the terms of the July 2020 Aspire CSPA to up to 200,000 shares.

In addition, on any date on which the Company submits a July 2020 Purchase Notice to Aspire Capital in an amount equal to 30,000 shares, the Company also has the right, in its sole discretion, to present Aspire Capital with a volume-weighted average price purchase notice (each, a "July 2020 VWAP Purchase Notice") directing Aspire Capital to purchase an amount of stock equal to up to 30% of the aggregate shares of the Company's common stock traded on its principal market on the next trading day (the "July 2020 VWAP Purchase Date"), subject to a maximum number of shares the Company may determine. The purchase price per share pursuant to such July 2020 VWAP Purchase Notice is generally 97% of the volume-weighted average price for the Company's common stock traded on its principal market on the July 2020 VWAP Purchase Date.

The July 2020 Purchase Price will be adjusted for any reorganization, recapitalization, non-cash dividend, stock split, or other similar transaction occurring during the period(s) used to compute the July 2020 Purchase Price. The Company may deliver multiple July 2020 Purchase Notices and July 2020 VWAP Purchase Notices to Aspire Capital from time to time during the term of the July 2020 Aspire CSPA, so long as the most recent purchase has been completed.

The July 2020 Aspire CSPA provides that the Company and Aspire Capital shall not effect any sales under the July 2020 Aspire CSPA on any purchase date where the closing sale price of the Company's common stock is less than $0.15. There are no trading volume requirements or restrictions under the July 2020 Aspire CSPA, and the Company will control the timing and amount of sales of the Company's common stock to Aspire Capital. Aspire Capital has no right to require any sales by the Company, but is obligated to make purchases from the Company as directed by the Company in accordance with the July 2020 Aspire CSPA. There are no limitations on use of proceeds, financial or business covenants, restrictions on future financing transactions, rights of first refusal, participation rights, penalties or liquidated damages in the July 2020 Aspire CSPA. The July 2020 Aspire CSPA may be terminated by the Company at any time, at its discretion, without any penalty or additional cost to

the Company. Aspire Capital has agreed that neither it nor any of its agents, representatives and affiliates shall engage in any direct or indirect short-selling or hedging of the Company's common stock during any time prior to the termination of the July 2020 Aspire CSPA. Any proceeds the Company receives under the July 2020 Aspire CSPA are expected to be used for working capital and general corporate purposes.

The July 2020 Aspire CSPA provides that the number of shares that may be sold pursuant to the July 2020 Aspire CSPA will be limited to 2,543,364 shares (the "July 2020 Exchange Cap"), which represents 19.99% of the Company's outstanding shares of common stock on July 21, 2020, unless stockholder approval or an exception pursuant to the rules of the Company's principal market, currently the Nasdaq Capital Market, is obtained to issue more than 19.99%. This limitation will not apply if, at any time the July 2020 Exchange Cap is reached and at all times thereafter, the average price paid for all shares issued under the July 2020 Aspire CSPA is equal to or greater than $5.907, which is the arithmetic average of the five closing sale prices of the Company's common stock immediately preceding the execution of the July 2020 Aspire CSPA. The Company is not required or permitted to issue any shares of common stock under the July 2020 Aspire CSPA if such issuance would breach its obligations under the rules or regulations of the Nasdaq Capital Market. The Company may, in its sole discretion, determine whether to obtain stockholder approval to issue more than 19.99% of its outstanding shares of Common Stock hereunder if such issuance would require stockholder approval under the rules or regulations of the Nasdaq Capital Market.

As of December 31, 2021, from the inception of the July 2020 Aspire CSPA, the Company has sold 2,221,040 shares of its common stock at an average price of $8.10 per share, including 555,555 shares of its common stock at $9.00 which the Company agreed to sell to Aspire Capital upon execution of the July 2020 Aspire CSPA, for total proceeds of $17,995. As of December 31, 2021, the Company had $12,005 in remaining availability for sales of its common stock under the July 2020 Aspire CSPA.

June 2020 Aspire Common Stock Purchase Agreement

On June 15, 2020, the Company entered into the June 2020 Aspire CSPA, which provided that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital was committed to purchase up to an aggregate of $20,000 of shares of the Company's common stock at the Company's request from time to time during the 30-month term of the Purchase Agreement. The June 2020 Aspire CSPA replaced the 2019 Aspire CSPA, which was terminated under the terms of the June 2020 Aspire CSPA. See below for terms of the 2019 Aspire CSPA.

Concurrently with entering into the June 2020 Aspire CSPA, the Company also entered into a registration rights agreement with Aspire Capital, in which the Company agreed to file one or more registration statements, as permissible and necessary to register under the Securities Act, registering the sale of the shares of the Company's common stock that have been issued to Aspire Capital under the June 2020 Aspire CSPA. On June 17, 2020, the Company filed with the SEC, a prospectus supplement to the Company's effective shelf Registration Statement on Form S-3 (File No. 333-236583) registering all of the shares of common stock that were issued to Aspire Capital under the June 2020 Aspire CSPA.

Under the terms of the June 2020 Aspire CSPA, on any trading day selected by the Company, the Company had the right, in its sole discretion, to present Aspire Capital with a purchase notice (each, a "June 2020 Purchase Notice"), directing Aspire Capital (as principal) to purchase up to 30,000 shares of the Company's common stock per business day, up to an aggregate of $20,000 of the Company's common stock, at a per share price (the "June 2020 Purchase Price") equal to the lesser of (i) the lowest sale price of the Company's common stock on the purchase date; or (ii) the arithmetic average of the three (3) lowest closing sale prices for the Company's common stock during the ten (10) consecutive trading days ending on the trading day immediately preceding the purchase date. The aggregate purchase price payable by Aspire Capital on any one purchase date could not exceed $500, unless otherwise mutually agreed. The parties could mutually agree to increase the number of shares of the Company's common stock that may be purchased per trading day pursuant to the terms of the June 2020 Aspire CSPA to up to 200,000 shares.

In addition, on any date on which the Company submitted a June 2020 Purchase Notice to Aspire Capital in an amount equal to 30,000 shares, the Company also had the right, in its sole discretion, to present Aspire Capital with a volume-weighted average price purchase notice (each, a "June 2020 VWAP Purchase Notice") directing Aspire Capital to purchase an amount of stock equal to up to 30% of the aggregate shares of the Company's common stock traded on its principal market on the next trading day (the "June 2020 VWAP Purchase Date"), subject to a maximum number of shares the Company may determine. The purchase price per share pursuant to such June 2020 VWAP Purchase Notice was generally 97% of the volume-weighted average price for the Company's common stock traded on its principal market on the June 2020 VWAP Purchase Date.

The June 2020 Purchase Price would have been adjusted for any reorganization, recapitalization, non-cash dividend, stock split, or other similar transaction occurring during the period(s) used to compute the June 2020 Purchase Price. The Company could

deliver multiple June 2020 Purchase Notices and June 2020 VWAP Purchase Notices to Aspire Capital from time to time during the term of the June 2020 Aspire CSPA, so long as the most recent purchase had been completed.

The June 2020 Aspire CSPA provided that the Company and Aspire Capital would not effect any sales under the June 2020 Aspire CSPA on any purchase date where the closing sale price of the Company's common stock was less than $0.15. There were no trading volume requirements or restrictions under the June 2020 Aspire CSPA, and the Company controlled the timing and amount of sales of the Company's common stock to Aspire Capital. Aspire Capital had no right to require any sales by the Company, but was obligated to make purchases from the Company as directed by the Company in accordance with the June 2020 Aspire CSPA. There were no limitations on use of proceeds, financial or business covenants, restrictions on future financing transactions, rights of first refusal, participation rights, penalties or liquidated damages in the June 2020 Aspire CSPA. The June 2020 Aspire CSPA could be terminated by the Company at any time, at its discretion, without any penalty or additional cost to the Company. Aspire Capital agreed that neither it nor any of its agents, representatives and affiliates would engage in any direct or indirect short-selling or hedging of the Company's common stock during any time prior to the termination of the June 2020 Aspire CSPA.

The June 2020 Aspire CSPA provided that the number of shares that could be sold pursuant to the June 2020 Aspire CSPA would be limited to 1,585,949 shares (the "June 2020 Exchange Cap"), which represented 19.99% of the Company's outstanding shares of common stock on June 15, 2020, unless stockholder approval or an exception pursuant to the rules of the Company's principal market, which was previously the Nasdaq Global Market, was obtained to issue more than 19.99%. This limitation would not apply if, at any time the June 2020 Exchange Cap was reached and at all times thereafter, the average price paid for all shares issued under the June 2020 Aspire CSPA was equal to or greater than $4.14, which is the price equal to the closing sale price of the Company's common stock immediately preceding the execution of the June 2020 Aspire CSPA. The Company was not required or permitted to issue any shares of common stock under the June 2020 Aspire CSPA if such issuance would breach its obligations under the rules or regulations of the Nasdaq Global Market. The Company could, in its sole discretion, determine whether to obtain stockholder approval to issue more than 19.99% of its outstanding shares of Common Stock hereunder if such issuance would require stockholder approval under the rules or regulations of the Nasdaq Global Market.

In consideration for entering into the June 2020 Aspire CSPA, upon satisfaction of certain conditions under the June 2020 Aspire CSPA, the Company issued to Aspire Capital 144,927 shares of the Company's common stock (the "June 2020 Commitment Shares"). These June 2020 Commitment Shares valued at approximately $848 were recorded in June 2020 as non-cash costs of equity financing and included within general and administrative expenses in the accompanying consolidated statements of operations and comprehensive loss.

From the inception of the June 2020 Aspire CSPA to when it was terminated in connection with entering into the July 2020 Aspire CSPA, the Company sold 3,776,428 shares of its common stock at an average price of $5.30 per share, for total proceeds of $20,000. There was no remaining availability for sales of the Company's common stock under the June 2020 Aspire CSPA when it was replaced by the July 2020 Aspire CSPA.

2019 Aspire Common Stock Purchase Agreement

On August 30, 2019, the Company entered into the 2019 Aspire CSPA, which provided that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital was committed to purchase up to an aggregate of $25,000 of shares of the Company's common stock at the Company's request from time to time during the 30-month term of the Purchase Agreement. Concurrently with entering into the 2019 Aspire CSPA, the Company also entered into a registration rights agreement with Aspire Capital, in which the Company agreed to file one or more registration statements, as permissible and necessary to register under the Securities Act, registering the sale of the shares of the Company's common stock that have been issued to Aspire Capital under the 2019 Aspire CSPA. On September 16, 2019, the Company filed with the SEC, a prospectus to the effective Registration Statement on Form S-1 (File No. 333-233632) registering 703,263 shares of common stock that could be offered to Aspire Capital from time to time under the 2019 Aspire CSPA.

Under the terms of the 2019 Aspire CSPA, on any trading day selected by the Company, the Company had the right, in its sole discretion, to present Aspire Capital with a purchase notice (each, a "2019 Purchase Notice"), directing Aspire Capital (as principal) to purchase up to 10,000 shares of the Company's common stock per business day, up to $25,000 of the Company's common stock in the aggregate at a per share price (the "2019 Purchase Price") equal to the lesser of (i) the lowest sale price of the Company's common stock on the purchase date, or (ii) the arithmetic average of the three (3) lowest closing sale prices for the Company's common stock during the ten (10) consecutive trading days ending on the trading day immediately preceding the purchase date. The aggregate purchase price payable by Aspire Capital on any one purchase date could not exceed $500.

In addition, on any date on which the Company submitted a 2019 Purchase Notice to Aspire Capital in an amount equal to 10,000 shares, the Company also had the right, in its sole discretion, to present Aspire Capital with a volume-weighted average price purchase notice (each, a "2019 VWAP Purchase Notice") directing Aspire Capital to purchase an amount of stock equal to up to 30% of the aggregate shares of the Company's common stock traded on its principal market on the next trading day (the "2019 VWAP Purchase Date"), subject to a maximum number of shares the Company may determine. The purchase price per share pursuant to such VWAP Purchase Notice was generally 97% of the volume-weighted average price for the Company's common stock traded on its principal market on the VWAP Purchase Date.

The 2019 Purchase Price would have been adjusted for any reorganization, recapitalization, non-cash dividend, stock split, or other similar transaction occurring during the period(s) used to compute the 2019 Purchase Price. The Company could deliver multiple 2019 Purchase Notices and 2019 VWAP Purchase Notices to Aspire Capital from time to time during the term of the 2019 Aspire CSPA, so long as the most recent purchase had been completed.

The 2019 Aspire CSPA provided that the Company and Aspire Capital would not effect any sales under the 2019 Aspire CSPA on any purchase date where the closing sale price of the Company's common stock was less than $0.25. There were no trading volume requirements or restrictions under the 2019 Aspire CSPA, and the Company controlled the timing and amount of sales of the Company's common stock to Aspire Capital. Aspire Capital had no right to require any sales by the Company, but was obligated to make purchases from the Company as directed by the Company in accordance with the 2019 Aspire CSPA. There were no limitations on use of proceeds, financial or business covenants, restrictions on future financing transactions, rights of first refusal, participation rights, penalties or liquidated damages in the 2019 Aspire CSPA. The 2019 Aspire CSPA could be terminated by the Company at any time, at its discretion, without any penalty or additional cost to the Company. Aspire Capital agreed that neither it nor any of its agents, representatives and affiliates would engage in any direct or indirect short-selling or hedging of the Company's common stock during any time prior to the termination of the 2019 Aspire CSPA.

The 2019 Aspire CSPA provided that the number of shares that may be sold pursuant to the 2019 Aspire CSPA would be limited to 521,134 shares (the "2019 Exchange Cap"), which represented 19.99% of the Company's outstanding shares of common stock on August 30, 2019, unless stockholder approval or an exception pursuant to the rules of the Company's principal market, which was previously the Nasdaq Global Market, was obtained to issue more than 19.99%. This limitation did not apply if, at any time the 2019 Exchange Cap was reached and at all times thereafter, the average price paid for all shares issued under the 2019 Aspire CSPA was equal to or greater than $21.70, which was the closing sale price of the Company's common stock immediately preceding the execution of the 2019 Aspire CSPA. The Company was not required or permitted to issue any shares of common stock under the 2019 Aspire CSPA if such issuance would breach its obligations under the rules or regulations of the Nasdaq Global Market. The Company could have, in its sole discretion, determined whether to obtain stockholder approval to issue more than 19.99% of its outstanding shares of Common Stock thereunder if such issuance would require stockholder approval under the rules or regulations of the Nasdaq Global Market.

In consideration for entering into the 2019 Aspire CSPA, concurrently with the execution of the 2019 Aspire CSPA, the Company issued to Aspire Capital 34,562 shares of the Company's common stock (the "Commitment Shares"). These Commitment Shares valued at $750 were recorded in August 2019 as non-cash costs of equity financing and charged against additional paid-in capital.

In addition to the limitations noted above, pursuant to the securities purchase agreement relating to the March 26, 2020 Registered Direct Offering, the Company was prohibited from issuing additional securities in any variable rate transaction (as defined in the securities purchase agreement), including under the 2019 Aspire CSPA for a period of one year, unless, following the 60th day of the date of the securities purchase agreement, the VWAP (as defined in the securities purchase agreement) was greater than the per share purchase price of the March 2020 Registered Direct Offering for five (5) consecutive trading days. In early June 2020, the Company's stock price achieved a VWAP greater than the per share purchase price of the March 2020 Registered Direct Offering for five consecutive trading days. As such, in early June 2020, the prohibition related to issuing additional securities in any variable rate transaction, including the 2019 Aspire CSPA, was no longer applicable.

From the inception of the 2019 Aspire CSPA to when it was terminated in connection with entering into the June 2020 Aspire CSPA, the Company sold an aggregate of 486,571 shares of its common stock at an average price of $6.22 per share, for total proceeds of $3,026. The total shares of common stock sold, combined with the 34,562 Commitment Shares issued, resulted in a total of 521,133 shares issued under the 2019 Aspire CSPA from the inception of the agreement to its termination. As the 2019 Exchange Cap was met, there was no remaining availability for sales of the Company's common stock under the 2019 Aspire CSPA when it was replaced by the June 2020 Aspire CSPA.

For the years ended December 31, 2021 and 2020, total proceeds from the issuance of common stock related to the 2019 Aspire CSPA, June 2020 Aspire CSPA and July 2020 Aspire CSPA was $6,334 and $33,941, respectively.

Common Stock

The Company's common stock has a par value of $0.0001 per share and consists of 200,000,000 authorized shares as of December 31, 2021 and 2020. There were 18,815,892 and 14,570,009 shares of common stock outstanding as of December 31, 2021 and 2020, respectively.

The Company had reserved shares of common stock for future issuance as follows:

	December 31,	
	2021	2020
Outstanding warrants to purchase common stock	1,274,176	1,377,727
Outstanding stock options (Note 11)	518,553	199,199
Outstanding stock appreciation rights (Note 11)	60,000	61,000
For possible future issuance under the 2016 Stock Plan (Note 11)	1,213,224	52,378
	3,065,953	1,690,304

Related Party Stock Repurchase

In April 2016, the Company repurchased 950 shares of its common stock for an aggregate price of $155 from an executive of the Company who was also a member of the Company's board of directors at that time. The repurchase of these shares is recorded as treasury stock on the accompanying consolidated balance sheets as of December 31, 2021 and 2020.

Preferred Stock

The Company's restated certificate of incorporation provides the Company's board of directors with the authority to issue $0.0001 par value preferred stock from time to time in one or more series by adopting a resolution and filing a certificate of designations. Voting powers, designations, preferences, dividend rights, conversion rights and liquidation preferences shall be stated and expressed in such resolutions. There were 10,000,000 shares designated as preferred stock and no shares outstanding as of December 31, 2021 and 2020.

Note 11: Stock-Based Compensation

2016 Incentive Award Plan

Effective September 20, 2016 (the "Effective Date"), the Company adopted the 2016 Incentive Award Plan (the "2016 Plan"). The 2016 Plan is the successor to the Company's 2008 Stock Plan (the "2008 Plan"). As of the Effective Date, no additional awards were granted under the 2008 Plan, but all stock awards granted under the 2008 Plan prior to the Effective Date remain subject to the terms of the 2008 Plan. Any shares associated with stock awards previously granted under the 2008 Plan that are forfeited subsequent to the Effective Date of the 2016 Plan are not eligible for future issuance under the 2016 Plan. All awards granted on and after the Effective Date will be subject to the terms of the 2016 Plan. The 2016 Plan provides for the grant of the following awards: (i) incentive stock options, (ii) nonstatutory stock options, (iii) SARs, (iv) restricted stock awards, (v) restricted stock unit awards and (vi) other stock awards. Eligible plan participants include employees, directors, and consultants.

An aggregate of 83,333 shares of the Company's common stock were initially available for issuance under awards granted pursuant to the 2016 Plan, which shares may be authorized but unissued shares, treasury shares, or shares purchased in the open market. On June 5, 2017, the Company's stockholders approved an amendment to the 2016 Plan to increase the aggregate number of shares of common stock that may be issued pursuant to awards under the 2016 Plan by an additional 120,000 shares. All other material terms of the 2016 Plan otherwise remained unchanged.

On July 31, 2019, the Company's stockholders approved an amendment to the 2016 Plan, to increase the number of shares reserved under the 2016 Plan by 100,000 and to increase the award limit on the maximum aggregate number of shares of the Company's common stock that may be granted to any one person during any calendar year from 25,000 to 100,000 shares of the Company's common stock. All other material terms of the 2016 Plan otherwise remain unchanged.

At the Company's Annual Meeting of Stockholders held on May 4, 2021, the Company's stockholders approved an amendment to the 2016 Plan ("the 2016 Plan Amendment"), to increase the aggregate number of shares of the Company's common stock

authorized for issuance thereunder by 1,500,000 shares. This amendment was approved by the Company's board of directors on March 10, 2021.

The approval by the Company's stockholders of the 2016 Plan Amendment was contingent upon the occurrence of certain other events, including that the 2016 Plan Amendment would become effective at the effective time of a certificate of amendment to the Company's certificate of incorporation filed with the Secretary of State of the State of Delaware in relation to a potential reverse stock split pursuant to the authority previously granted to the Company's board of directors by the Company's stockholders at the 2020 Annual Meeting. The Certificate of Amendment filed in connection with the Reverse Stock Split became effective at 5:00pm on May 25, 2021, and thus, the 2016 Plan Amendment became effective on May 25, 2021.

As of December 31, 2021, there were 1,213,224 shares available for future issuance under the 2016 Plan.

Under both the 2008 Plan and the 2016 Plan, options to purchase the Company's common stock may be granted at a price no less than the fair value of a common stock share on the date of grant. The fair value shall be the closing sales price for a share as quoted on any established securities exchange for such grant date or the last preceding date for which such quotation exists. Vesting terms of options issued are determined by the board of directors or compensation committee of the board. The Company's stock options vest based on terms in the stock option agreements and have a maximum term of ten years.

Stock Appreciation Rights

Effective December 17, 2019, the Company entered into an amended and restated employment agreement with Paula Brown Stafford (the "Amended and Restated Stafford Employment Agreement"). On January 6, 2020, following the release of top-line results of the Company's Phase 3 molluscum clinical program as provided in the Amended and Restated Stafford Employment Agreement, 60,000 stock appreciation rights ("SARs") were granted to Mrs. Stafford with an exercise price of $8.20 per share (the fair market value of the Company's common stock on the grant date) and with a ten-year term (the "Stafford SAR Award"). The Stafford SAR Award was granted on a contingent basis and would have been considered irrevocably forfeited and voided in full if sufficient shares of the Company's common stock were not available under the 2016 Plan or if the Company failed to obtain stockholder approval for amendments to the 2016 Plan at the next annual stockholders' meeting to provide sufficient shares for the Stafford SAR Award. Such shares became available under the 2016 Plan on February 1, 2020, and the SARs were no longer considered granted on a contingent basis and are classified as equity-based awards. The Stafford SAR Award vested quarterly and was vested in full as of December 31, 2021.

During the years ended December 31, 2021 and 2020, the Company recorded employee stock-based compensation expense related to SARs of $115 and $151, respectively. As of December 31, 2021, there were a total of 60,000 SARs outstanding, which were fully exercisable.

Inducement Grants

In prior years, the Company awarded nonstatutory stock options to purchase shares of common stock to newly-hired employees as inducements material to the individuals' entering into employment with the Company within the meaning of Nasdaq Listing Rule 5635(c)(4) (the "Inducement Grants"). On May 31, 2018, the Company awarded 10,050 Inducement Grants with an exercise price of $31.50 per share, and on September 6, 2019, the Company awarded 2,500 Inducement Grants with an exercise price of $26.20 per share. The Inducement Grants were awarded outside of the Company's 2016 Plan, pursuant to Nasdaq Listing Rule 5635(c)(4), but have terms and conditions generally consistent with the Company's 2016 Plan and vest over three years, subject to the employee's continued service as an employee or consultant through the vesting period.

During the year ended December 31, 2020, the 2,500 Inducement Grants related to the September 6, 2019 award were forfeited in their entirety, and 1,300 Inducement Grants related to the May 31, 2018 award were forfeited.

During the year ended December 31, 2021, an additional 7,500 Inducement Grants related to the May 31, 2018 award were forfeited. As of December 31, 2021, there were a total of 1,250 Inducement Grants outstanding.

Stock Compensation Expense

During the years ended December 31, 2021 and 2020, the Company recorded employee stock-based compensation expense, including fair value adjustments of the Tangible Stockholder Return Plan, as follows:

	Year Ended December 31,	
	2021	2020
Stock options	$ 826	$ 840
Stock appreciation rights	115	151
Tangible Stockholder Return Plan (Note 12)	(666)	317
Total	$ 275	$ 1,308

Total stock-based compensation expense for the years ended December 31, 2021 and 2020 included in the accompanying consolidated statements of operations and comprehensive loss is as follows:

	Year Ended December 31,	
	2021	2020
Research and development	$ (250)	$ 834
General and administrative	525	474
Total	$ 275	$ 1,308

The fair value of each option grant is estimated on the grant date using the Black-Scholes option-pricing model, and the following weighted average assumptions:

	Year Ended December 31,	
	2021	2020
Estimated dividend yield	— %	— %
Expected volatility	107.54 %	105.64 %
Risk-free interest rate	1.02 %	1.10 %
Expected life of options (in years)	5.79	5.46
Weighted-average fair value per share	$ 7.13	$ 4.11

The Company estimates forfeitures based on various classes of option grantees and the rates used ranged from 11.9% to 12.2% during the years ended December 31, 2021 and 2020, respectively.

Stock option activity for the periods indicated is as follows:

	Shares Available for Grant	Shares Subject to Outstanding Options	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value
Options outstanding as of December 31, 2019	38,844	178,933	$ 38.90		
SARs granted	(61,000)	—			
SARs forfeited	100,000	—			
Options granted	(55,700)	55,700	5.21		
Options forfeited	30,234	(34,284)	32.89		
Options exercised	—	(1,150)	4.65		
Options outstanding as of December 31, 2020	52,378	199,199	$ 30.71		
Additional shares reserved under plan	1,500,000	—			
SARs granted	—	—			
SARs forfeited	1,000	—			
Options granted	(385,885)	385,885	8.82		
Options forfeited	45,731	(53,689)	26.72		
Options exercised	—	(12,842)	4.74		
Options outstanding as of December 31, 2021	1,213,224	518,553	$ 15.48	8.76	$ 2
Vested and expected to vest as of December 31, 2020		198,377	$ 30.75	7.64	$ 147
Exercisable as of December 31, 2020		178,287	$ 32.56	7.53	$ 141
Vested and expected to vest as of December 31, 2021		470,773	$ 16.24	8.67	$ 2
Exercisable as of December 31, 2021		200,638	$ 26.59	7.46	$ 2

The total intrinsic value of options exercised during the years ended December 31, 2021 and 2020 was $97 and $3, respectively. As of December 31, 2021 and 2020, total unrecognized compensation expense related to non-vested stock options was $1,852 and $140, respectively, which is expected to be recognized over a weighted average period of 2.26 and 0.72 years, respectively.

Note 12: Tangible Stockholder Return Plan

Performance Plan

On August 2, 2018, the Company's board of directors approved and established the Tangible Stockholder Return Plan, which is a performance-based long-term incentive plan (the "Performance Plan"). The Performance Plan was effective immediately upon approval and expires on March 1, 2022. The Performance Plan covers all employees, including the Company's executive officers, consultants and other persons deemed eligible by the Company's compensation committee. The core underlying metric of the Performance Plan is the achievement of two share price goals for the Company's common stock, which if achieved, would represent measurable increases in stockholder value. The Performance Plan was adjusted on May 25, 2021 as a result of the 1-for-10 Reverse Stock Split, which correspondingly adjusted the two share price goals.

The Performance Plan is tiered, with two separate tranches, each of which has a distinct share price target (measured as the average publicly traded share price of the Company's common stock on the Nasdaq stock exchange for a 30 consecutive trading day period) that will, if achieved, trigger a distinct fixed bonus pool. As adjusted for the Reverse Stock Split, the share price target for the first tranche and related bonus pool are $111.70 per share and $25,000, respectively. As adjusted for the Reverse Stock Split, the share price target for the second tranche and related bonus pool are $254.50 per share and $50,000, respectively. The compensation committee has discretion to distribute the bonus pool related to each tranche among eligible participants by establishing individual minimum bonus amounts before, as well as by distributing the remainder of the applicable pool after, the achievement of each tranche specific share price target. Otherwise, if the Company does not achieve one or both related share price targets, as defined, no portion of the bonus pools will be paid.

The Performance Plan provides for the distinct fixed bonus pools to be paid in the form of cash. However, the compensation committee has discretion to pay any bonus due under the Performance Plan in the form of cash, shares of the Company's

common stock or a combination thereof, provided that the Company's stockholders have approved the reservation of shares of the Company's common stock for such payment.

The Performance Plan permits the compensation committee to make bonus awards subject to varying payment terms, including awards that vest and are payable immediately upon achieving an applicable share price target as well as awards that pay over an extended period (either with or without ongoing employment requirements). The Performance Plan contemplates that no bonus award payments will be delayed beyond 24 months for named executive officers or more than 12 months for all other participants.

For purposes of determining whether a share price target has been met, the share price targets will be adjusted in the event of any stock splits, cash dividends, stock dividends, combinations, reorganizations, reclassifications or similar events. In the event of a change in control, as defined in the Performance Plan, during the term of the Performance Plan, a performance bonus pool will become due and payable to participants on a pro-rata basis, as calculated and determined by the compensation committee based on the Company's progress toward the share price target as of the date of the change in control and subject to adjustment by the compensation committee as permitted under the Performance Plan.

The Company has concluded that the Performance Plan is within the scope of ASC 718, *Compensation—Stock Compensation* as the underlying plan obligations are based on the potential attainment of certain market share price targets of the Company's common stock. Any awards under the Performance Plan would be payable, at the discretion of the Company's compensation committee following the achievement of the applicable share price target, in cash, shares of the Company's common stock, or a combination thereof, provided that, prior to any payment in common stock, the Company's stockholders have approved the reservation of shares of the Company's common stock for such payment.

ASC 718 requires that a liability-based award should be classified as a liability on the Company's accompanying consolidated balance sheets and the amount of compensation cost recognized should be based on the fair value of the liability. When a liability-based award includes both a service and market condition, the market condition is taken into account when determining the appropriate method to estimate fair value and the compensation cost is amortized over the estimated service period. Therefore, the liability associated with the Performance Plan obligation is recorded within other long-term liabilities on the accompanying consolidated balance sheets at the estimated fair value on the date of issuance and is re-valued each subsequent reporting period end. The Company recognizes stock-based compensation expense within operating expenses in the accompanying consolidated statements of operations and comprehensive loss, including adjustments to the fair value of the liability-based award, on a straight-line basis over the requisite service period.

The fair value of obligations under the Performance Plan are estimated using a Monte Carlo simulation approach. The Company's common stock price is simulated under the Geometric Brownian Motion framework under each simulation path. The other assumptions for the Monte Carlo simulation include the risk-free interest rate, estimated volatility and the expected term. Expected stock price volatility is based on the Company's actual historical volatility over a historical period equal to the expected remaining life of the plan, adjusted for certain market considerations and other factors. The fair value of the underlying common stock is the published closing market price on the Company's principal market, which is currently the Nasdaq Capital Market, as of each reporting date, as adjusted for significant results, as necessary (if applicable). The risk-free interest rate is based on the United States Treasury yield curve in effect on the date of valuation equal to the remaining expected life of the plan. The dividend yield percentage is zero because the Company does not currently pay dividends, nor does it intend to do so during the expected term of the plan. The expected life of bonus awards under the Performance Plan is assumed to be equivalent to the remaining contractual term based on the estimated service period including the service inception date of the plan participants and the contractual end of the Performance Plan.

The fair value of the Performance Plan is estimated at each financial reporting date using the Monte Carlo simulation model and the following assumptions:

	December 31,	
	2021	2020
Estimated dividend yield	—	—
Expected volatility	125.72 %	200.00 %
Risk-free interest rate	0.07 %	0.11 %
Expected term (years)	0.17	1.17
Fair value per share of common stock underlying the Performance Plan	$ 4.26	$ 8.70

During the year ended December 31, 2021, the Company recorded fair value adjustments, related to the Performance Plan, to employee stock-based compensation expense that resulted in a reduction of total stock-based compensation expense of $666. This adjustment relates to the fair value of the associated Performance Plan liability being zero as of December, 31, 2021, as the Performance Plan expires on March 1, 2022. During the year ended December 31, 2020, the Company recorded employee stock-based compensation expense related to the Performance Plan of $317.

Note 13: Income Taxes

There was no income tax benefit recognized for the years ended December 31, 2021 and 2020 due to the Company's history of net losses combined with an inability to confirm recovery of the tax benefits from the Company's losses and other net deferred tax assets. The Company has established a valuation allowance against its deferred tax assets due to the uncertainty surrounding the realization of such assets.

Net operating loss ("NOL") and tax credit carryforwards are subject to review and possible adjustment by the Internal Revenue Service and state tax authorities. NOL and tax credit carry forwards may become subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant stockholders over a three-year period in excess of 50%, as defined under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, or "the Code," as well as similar state tax provisions. The amount of the annual limitation, if any, will be determined based on the value of the company immediately prior to an ownership change. Subsequent ownership changes may further affect the utilization in future years. Additionally, U.S. tax laws limit the time during which certain of these carry forwards may be applied against future taxable income (in the case of NOL carryforwards) and tax liabilities (in the case of tax credits). Therefore, the Company may not be able to take full advantage of these carry forwards for federal or state income tax purposes.

During the course of preparing the Company's consolidated financial statements as of and for the year ended December 31, 2021, the Company completed an assessment of the available NOL and tax credit carryforwards under Sections 382 and 383, respectively, of the Code. The Company determined that it underwent multiple ownership changes throughout its history as defined under Section 382, including most recently in 2015 and 2020. As a result of the identified ownership changes, the portion of NOL and tax credit carryforwards attributable to the pre-ownership change periods are subject to a substantial annual limitation under Sections 382 and 383 of the Code. The Company has adjusted its NOL and tax credit carryforwards to address the impact of the 382 ownership changes. This resulted in a reduction of available federal and state NOLs of $113.8 million and $149.4 million, respectively. The write down of the NOLs reduced the tax loss carryforward line within gross deferred tax assets as previously disclosed by $26.8 million, with a corresponding decrease in the valuation allowance. The Company also reduced its tax credit carryforwards within gross deferred tax assets by $9.7 million with a corresponding decrease in the valuation allowance, comprised of $8.1 million related to Section 383 limitations on prior credits and $1.6 million related to amounts that would not have been recorded during the year ended December 31, 2020 given the 383 limitation.

Since the limitation affected the prior period, the Company has adjusted its 2020 tax footnote presentation with respect to the gross NOL deferred tax asset, the tax credit carryforwards and the corresponding valuation allowance. However, there was no net impact to the net deferred tax asset and tax expense as the decreases in the NOL and tax credit carryforwards were offset completely by a corresponding adjustment to the Company's overall valuation allowance.

The reasons for the difference between actual income tax benefit for the years ended December 31, 2021 and 2020, and the amount computed by applying the statutory federal income tax rate to losses before income tax benefit are as follows:

	Year Ended December 31,	
	2021	2020
Income tax benefit at federal statutory rate	$ (6,235)	$ (6,152)
State income taxes, net of federal benefit	—	(533)
Non-deductible expenses	63	492
Research and development tax credits	(768)	(885)
Write-off of Attributes Due to Sections 382 and 383	—	34,983
Change in State Tax Rate	1,532	—
Other	(96)	222
Change in valuation allowance	5,504	(28,127)
Total income tax provision	$ —	$ —

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of the Company's deferred tax assets and deferred tax liabilities are as follows:

	As of December 31,	
	2021	2020
Deferred tax assets:		
Accrued compensation	$ 247	$ 214
Accrued liabilities	117	375
Tax loss carryforwards	21,008	16,186
Intangible assets	213	248
Stock-based compensation	499	526
Tax credits	1,653	885
Research and development service obligation	5,575	6,120
Right-of-use lease liabilities	736	—
Deferred revenue	1,849	1,649
Fixed assets	305	345
Other	50	52
Total deferred tax assets	32,252	26,600
Less valuation allowance	(31,808)	(26,304)
Net deferred tax asset	444	296
Deferred tax liabilities:		
Right-of-use lease assets	(356)	—
Other	(88)	(296)
Net noncurrent deferred tax asset (liability)	$ —	$ —

On March 27, 2020, the CARES Act was signed into law and provides for emergency aid to businesses and individuals that are affected by the COVID-19 pandemic. Relief items for businesses included loans administered by the SBA through the PPP, delayed payroll tax payments, an employee retention tax credit, and favorable modifications with respect to the deductibility of interest expense and utilization of net operating losses. As mentioned in Note 9—Paycheck Protection Program, the Company obtained a PPP loan of approximately $956 for which was fully forgiven in 2021. There was no significant impact to the Company as a result of the other provisions within the CARES Act.

As of December 31, 2021, the Company had federal and state NOL carryforwards of $100,034 and $62,907, respectively. The NOLs begin to expire in 2028 and 2023 for federal and state tax purposes, respectively. As of December 31, 2021, the Company had government research and development tax credits of approximately $1,653 to offset future federal taxes which begin to expire in 2040.

The Company had no unrecognized tax benefits as of December 31, 2021 and 2020. The Company does not anticipate a significant change in total unrecognized tax benefits within the next 12 months. Tax years 2018-2020 remain open to examination by the major taxing jurisdictions to which the Company is subject. Additionally, years prior to 2018 are also open to examination to the extent of loss and credit carryforwards from those years.

Note 14: Retirement Plan

The Company maintains a defined contribution savings plan under Section 401(k) of the Internal Revenue Code. This plan covers all employees who meet minimum age requirements and allows participants to defer a portion of their annual compensation on a pre-tax basis. The Company has made discretionary matching contributions, up to 5% of gross wages during 2021, and up to 3% of gross wages during 2020. The Company contributed $258 and $133, for the years ended December 31, 2021 and 2020, respectively.

Note 15: Related Party Transactions

Members of the Company's board of directors held 100,497 and 110,474 shares of the Company's common stock as of December 31, 2021 and 2020, respectively.

Health Decisions

On October 25, 2018, the Company announced a foundational collaboration with Health Decisions, Inc. ("Health Decisions"). Health Decisions, which was acquired by Premier Research in July 2021, is a full-service contract research organization specializing in clinical studies of therapeutics for women's health indications. The Company's Chairman, President and Chief Executive Officer, Paula Brown Stafford, was a stockholder and previously served on the board of directors of Health Decisions.

Reedy Creek

Reedy Creek beneficially owned greater than 5% of the Company's outstanding common stock and held approximately 395,000 warrants, all of which were acquired during the January 2018 Offering, and, accordingly, was a related party of the Company at the time the Company entered into the Purchase Agreement with Reedy Creek, described in Note 6 —Research and Development Arrangements. The Purchase Agreement with Reedy Creek was evaluated and approved pursuant to the Company's existing related party transactions policy.

Based solely on information reported in a Schedule 13D/A filed with the SEC on June 24, 2021, Reedy Creek is no longer a greater than 5% stockholder of the Company.

2020 Registered Direct Offering

Sabby Volatility Warrant Master Fund, Ltd. ("Sabby"), while a greater than 5% stockholder of the Company, purchased 620,000 shares of common stock and pre-funded warrants to purchase up to 260,233 shares of common stock for approximately $3,800 in the March 2020 Registered Direct Offering described in Note 10—Stockholders' Equity (Deficit). Sabby's participation in the March 2020 Registered Direct Offering was evaluated and approved pursuant to the Company's existing related party transactions policy. Based solely on information reported in a Schedule 13G/A filed with the SEC on January 5, 2021, Sabby no longer held any of the Company's common stock or pre-funded warrants to purchase shares of the Company's common stock.

Joseph Moglia, while a greater than 5% stockholder of the Company, purchased 100,000 shares of common stock for $430 in the March 2020 Registered Direct Offering described in Note 10—Stockholders' Equity (Deficit). Mr. Moglia's participation in the March 2020 Registered Direct Offering was evaluated and approved pursuant to the Company's existing related party transactions policy. Based solely on information reported in a Schedule 13D/A filed with the SEC on January 27, 2021, Mr. Moglia is no longer a greater than 5% stockholder of the Company.

Note 16: Assets Held for Sale, Impairment Charges

The Company has pursued a broader strategic plan since 2019 to shift its operating cost structure characteristics from fixed to variable, including efforts to reduce or offset its fixed Previous Facility Lease obligation. The Previous Facility once served as the Company's corporate headquarters and its sole research, development and manufacturing facility. The Company conducted certain activities and engaged in certain transactions during the second and third quarters of 2020 that ultimately achieved relief from the remaining fixed Previous Facility Lease obligation. These activities and transactions had various accounting implications, which are described in detail within this Note and Note 17—Asset Group Disposition.

Following the completion of a large scale manufacturing campaign that produced clinical trial materials for the Company's B-SIMPLE4 Phase 3 study for SB206 in May 2020, and in contemplation of the lease termination transaction described in Note 8—Commitments and Contingencies, the Company initiated decommissioning of the Previous Facility in June 2020, and, on June 29, 2020, the physical removal of the primary components of the large scale manufacturing process equipment from the Previous Facility was deemed substantially complete. As a result of these decommissioning actions, the Company determined that, as of June 29, 2020, the Company had fundamentally changed its intended use of the Previous Facility and certain related assets, including (i) the removal of the Company's large scale cGMP drug manufacturing capability and (ii) the conditioning of the Previous Facility to facilitate a transaction that would reduce or offset the Company's remaining fixed Previous Facility Lease obligation. This fundamental change in the intended use of certain assets required the Company to reassess its historical asset groupings, which resulted in a change from a single, entity-level asset group to multiple asset groups based on the lowest level of separately identifiable cash flows. The multiple new asset groups identified during the reassessment are described in detail below.

As of June 29, 2020, the Company evaluated all of its long-lived assets for potential held for sale classification pursuant to policies described in Note 1—Organization and Significant Accounting Policies. The Company identified the following two disposal groups that met the criteria to be classified as held for sale within its consolidated balance sheets as of June 30, 2020:

- The first disposal group consisted of furniture and equipment to be sold to the New Tenant pursuant to a bill of sale executed on July 16, 2020. The disposal group's carrying value of $454 was compared to its estimated fair value less costs to sell of $265, resulting in an impairment charge of $189 recorded during the three months ended June 30, 2020. The selling price expected to be paid by the New Tenant to acquire the furniture and equipment disposal group was the best estimate of fair value, which the Company concluded was a Level 2 input within the fair value measurement hierarchy in FASB ASC 820, *Fair Value Measurements*.
- The second disposal group consisted of certain manufacturing and laboratory equipment associated with the Company's large scale drug manufacturing capability that the Company intended to sell through a consignment seller. The disposal group's carrying value of $1,510 was compared to its estimated fair value less costs to sell of $712, resulting in an impairment charge of $798 recorded during the three months ended June 30, 2020. The estimated selling prices provided by the consignment seller were determined to be the best estimate of fair value, which the Company concluded were Level 3 inputs within the fair value measurement hierarchy.

The Company assessed its remaining long-lived assets classified as held and used for potential impairment as of June 29, 2020 pursuant to the Company's policy described in Note 1—Organization and Significant Accounting Policies, including those long-lived assets in the following two asset groups:

- *Right-of-use asset, leasehold improvements and other property affixed to the Previous Facility.* This asset group, which had an aggregate carrying value of $8,227 as of June 29, 2020, consisted of a right-of-use asset associated with the Previous Facility Lease of $1,816, leasehold improvements and other property affixed to the Previous Facility of $5,872, and restricted cash that secured a letter of credit associated with the Previous Facility Lease of $539. Due to actions taken as of June 29, 2020, the Company committed to no longer use the asset group to support the Company's future revenue-producing drug development operations. This significant change in the intended use of this asset group was considered an indicator of impairment that resulted in the performance of a recoverability test. The Company concluded that the asset group was not recoverable because the asset group's carrying value exceeded its expected future undiscounted net cash flows, which were based on Company-specific facts and circumstances and included the economics of and costs associated with the lease termination transaction described in Note 8—Commitments and Contingencies, and thus, the Company identified a potential impairment. The Company then estimated the fair value of the asset group, which was based on fair value principles in FASB ASC 820, *Fair Value Measurements* and generally focuses on the value that a market participant would be willing to pay for the highest and best use of the asset group. The Company determined that the lease terms established in the New Tenant's prime lease of the Previous Facility were representative of the asset group's highest and best use and were consistent with market terms; therefore, such terms were considered to be the best available valuation inputs for the fair value estimate. Using a market average borrowing rate to discount the New Tenant's prime lease payments, the Company estimated the fair value of the asset group to be $7,298 and, as a result, measured and recorded an impairment charge of $929 during the three months ended June 30, 2020. The inputs to the fair value estimate of this asset group were determined to be Level 3 inputs within the fair value measurement hierarchy.

  The Company determined that the June 30, 2020 carrying value of this asset group, as adjusted for the aforementioned impairment charge, was representative of its value to a market participant for its highest and best use, as required under the ASC 820 fair value model.

- *Other assets held and used.* This asset group, which had an aggregate carrying value of $505 as of June 29, 2020, consisted of equipment and other property that was not directly associated with the Company's continuing research, development and pilot scale drug manufacturing capabilities. The Company tested this asset group for recoverability because the Company intends to dispose of these assets significantly before the end of their previously estimated useful life, which is an impairment indicator. However, this asset group had not met the criteria to be classified as held for sale because the Company has not yet established a plan to sell these assets and is uncertain whether it will do so within the next twelve months. During the recoverability test, the Company determined that this asset group was unlikely to generate any material future cash flows for the Company. The Company further determined that a market participant was unlikely to pay any material value for such assets and, therefore, concluded that the fair value of this asset group was zero. As a result, the Company measured and recorded an impairment charge of $505 during the three months ended June 30, 2020. The inputs to the fair value estimate of this asset group were determined to be Level 3 inputs within the fair value measurement hierarchy.

The Company's then remaining long-lived assets, which include retained manufacturing and laboratory equipment with a carrying value of $744 that continued to support and enable the Company's continuing research, development and pilot scale drug manufacturing capabilities, had no change to their intended use, no impairment indicators were identified, and no further assessment of recoverability was required.

As noted above, during the quarterly period ended June 30, 2020, the Company recognized within its accompanying consolidated statements of operations and comprehensive loss an impairment loss on long-lived assets totaling $2,421. During the fourth quarter of 2020, certain equipment assets that the Company had previously classified as held for sale during the aforementioned June 29, 2020 evaluation were reclassified as held and used. The reclassification determination was based upon new facts and circumstances that enabled the Company to re-use the equipment in connection with the planned build-out of the Company's newly leased facility in Durham, North Carolina. While classified as held for sale, these assets had been carried at their aggregate fair value less costs to sell of $356. Upon reclassification to held and used, the Company avoided certain estimated selling costs that had been included in the previously recognized impairment charge during the quarterly period ended June 30, 2020 and, as a result, the Company recognized a $144 favorable adjustment to the impairment charge during the quarterly period ended December 31, 2020 for a total impairment charge of $114 for the year ended December 31, 2020. The reclassified assets were included in property and equipment, net, in the Company's consolidated balance sheet at their aggregate fair value of $500.

See Note 17—Asset Group Disposition for the additional loss recorded by the Company, which was based upon Company-specific facts and circumstances associated with the July 2020 lease termination transaction during the year ended December 31, 2020, rather than the market participant valuation model that was required to be used during the impairment assessment as of June 29, 2020.

Note 17: Asset Group Disposition

The Company conducted certain activities and engaged in certain transactions during the second and third quarters of 2020 that ultimately achieved relief from the remaining fixed Previous Facility Lease obligation. These activities and transactions had various accounting implications, which are described in detail within this Note and Note 16—Assets Held for Sale, Impairment Charges.

On July 16, 2020, the Company entered into the lease termination transaction as described in Note 8—Commitments and Contingencies. Subsequent to July 16, 2020, the Company utilized a sublet premises within the Previous Facility to operate its corporate headquarters, research and development laboratories and pilot scale cGMP manufacturing activities, and did so prior to taking possession of its New Facility.

The following events and transactions occurred during the year ended December 31, 2020 for the Company's various disposal and asset groups, as described in Note 16—Assets Held for Sale, Impairment Charges:

- *Disposal groups classified as assets held for sale.*
    - The first disposal group, which consisted of furniture and equipment, was sold to the New Tenant pursuant to a bill of sale executed on July 16, 2020. The disposal group's carrying value, net of an impairment charge recognized in the quarterly period ended June 30, 2020, was equal to the amount of proceeds received; therefore, no gain or loss was recognized on the disposition.
    - The second disposal group, which consisted of certain manufacturing and laboratory equipment associated with the Company's large scale drug manufacturing capability, was held for sale over time through a consignment seller. During the year ended December 31, 2020, the Company received aggregate net proceeds of $242 from the sale of certain assets within this disposal group, with no gain or loss recognized. During the fourth quarter of 2020, the Company determined certain assets in this disposal group would be re-used by the Company rather than sold by the consignment seller. As a result, such assets, which had an aggregate fair value less cost to sell of $356, were reclassified and presented as held and used as of December 31, 2020. As of December 31, 2020, the Company had $114 of disposal group carrying value remaining. During the second quarter of 2021, the Company assessed the disposal group for recoverability and determined that the remaining carrying value of the disposal group had no fair value. As a result of this assessment, the Company recorded an impairment charge of $114 during the three months ended June 30, 2021.

- *Long-lived asset groups classified as held and used.*
  - *Right-of-use asset, leasehold improvements and other property affixed to the Previous Facility, restricted cash and lease liabilities associated with the Previous Facility Lease*. In conjunction with the lease termination transaction as described in Note 8—Commitments and Contingencies, all assets and liabilities within this asset group were disposed of on July 16, 2020. As of the disposition date, the aggregate carrying value of the assets was $7,257 and the aggregate carrying value of the associated lease liabilities was $5,951. The $1,306 net charge resulting from the write-off of these assets and liabilities was combined with $466 of other direct costs incurred in connection with the lease termination transaction to result in a $1,772 total loss on disposition. This loss, which is in addition to the impairment loss recognized during the quarterly period ended June 30, 2020 and described in Note 16—Assets Held for Sale, Impairment Charges, was based upon Company-specific facts and circumstances associated with the July 2020 lease termination transaction, rather than the market participant valuation model that was required to be used during the impairment assessment as of June 29, 2020.
  - *Remaining long-lived property and equipment assets.* The Company's remaining long-lived assets, which include retained manufacturing and laboratory equipment, continue to support and enable the Company's continuing research, development and pilot scale drug manufacturing capabilities. The Company continued to account for these assets pursuant to its existing accounting policies, including recognition of additions and disposals occurring in the normal course and the continued depreciation based on estimated useful lives.

The following table summarizes the loss on facility asset group disposition as presented within the accompanying consolidated statements of operations and comprehensive loss during the year ended December 31, 2020:

Property and Equipment, net	$	4,902
Restricted cash (security deposit)		539
Right-of-use assets		1,816
Total facility group assets		7,257
Lease liabilities, current portion		(1,169)
Lease liabilities, net of current portion		(4,782)
Total facility group liabilities		(5,951)
Net carrying value of facility asset group	$	1,306
Other direct disposal costs		466
Loss on facility asset group disposition	$	1,772

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act, refers to controls and procedures 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 such information is accumulated and communicated to a company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure.

In designing and evaluating our disclosure controls and procedures, management recognizes that disclosure controls and procedures, no matter how well conceived and operated, cannot provide absolute assurance that the objectives of the disclosure controls and procedures are met. Additionally, in designing disclosure controls and procedures, our management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible disclosure controls and procedures. Our disclosure controls and procedures are designed to provide reasonable assurance of achieving their objectives. The design of any system of controls also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions; over time, controls may become inadequate because of changes in conditions, or the degree of compliance with policies or procedures may deteriorate. Because of the inherent limitations in a control system, misstatements due to error or fraud may occur and not be detected.

As of December 31, 2021, our management, with the participation of our principal executive and financial officers, has evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). Our 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 upon such evaluation, our principal executive and financial officers have concluded that, as of December 31, 2021, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in the Exchange Act Rule 13a-15(f). Our internal control over financial reporting is designed to provide reasonable assurance to our management and board of directors regarding the preparation and fair presentation of published financial statements. A control system, no matter how well designed and operated, can only provide reasonable, not absolute, assurance that the objectives of the control system are met. Because of these inherent limitations, management does not expect that our internal controls over financial reporting will prevent all error and all fraud. Management conducted an evaluation of our internal control over financial reporting based on the framework in Internal Control—Integrated Framework issued in 2013 by the Committee of Sponsoring Organizations of the Treadway Commission (the "2013 Framework"). Based on our evaluation under the 2013 Framework, management concluded that our internal control over financial reporting was effective as of December 31, 2021.

As we are a non-accelerated filer, our independent registered public accounting firm is not required to issue an attestation report on our internal control over financial reporting.

Changes in Internal Control over Financial Reporting

There were no changes in the Company's internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act) during the last quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Directors

Our board of directors consists of seven directors and is divided into three classes with staggered, three-year terms. The terms of office of directors in Class III will expire at our annual meeting of stockholders to be held in 2022, or the 2022 Annual Meeting, and when such director's successor is elected and qualified, or upon such director's death, resignation or removal, and our Class III directors are expected to stand for re-election at the 2022 Annual Meeting. The terms of office of directors in Class I and Class II do not expire until our annual meetings of stockholders to be held in 2023 and 2024, respectively, and until his or her successor is elected and qualified, or until his or her death, resignation or removal.

Information about our directors, their ages as of February 4, 2022, occupations and length of board service are provided in the table below. Additional biographical descriptions are set forth in the text below the tables and include the primary individual experience, qualifications, qualities and skills of each director that led to the conclusion that such director should serve as a member of our board of directors at this time.

Name of Director	Age	Principal Occupation	Director Since
Class I Directors:			
John Palmour, Ph.D. (1)(3)	61	Vice President and Chief Technology Officer, Wolfspeed, Inc.	2010
Steven D. Skolsky (1)	65	Principal, Expis Partners	2021
Paula Brown Stafford	57	President and Chief Executive Officer, Novan, Inc.	2017
Class II Directors:			
James L. Bierman (2)(3)	69	Retired President and Chief Executive Officer, Owens & Minor, Inc.	2020
Machelle Sanders (2)	58	Secretary of the N.C. Department of Commerce	2017
Class III Directors:			
W. Kent Geer (1)	67	Managing Director—Finance and Investor Relations, Med1 Ventures, LLC	2015
Robert J. Keegan (1)(2)	74	Retired Chief Executive Officer, Goodyear Tire and Rubber Co.	2016

(1) Member of our audit committee

(2) Member of our compensation committee

(3) Member of our nominating and corporate governance committee

John Palmour has served as a member of our board of directors since 2010. Since 1987, Dr. Palmour has worked at Wolfspeed, Inc. (formerly Cree, Inc.), a company he co-founded and for which he currently serves as Vice President and the Chief Technology Officer. Dr. Palmour served on Wolfspeed's board of directors from 1995 to 2010. He is currently on the board of directors of Goodzer, Inc., a privately held company focused on local services Internet advertising. We believe that Dr. Palmour's significant experience and leadership in the technology field and the advancement of innovation to broad-scale product commercialization qualifies him to serve on our board of directors.

Steven D. Skolsky has served as a member of our board of directors since 2021. Since January 2010, Mr. Skolsky has served as the founding Principal of Expis Partners, a strategic consulting firm to the biotech, pharmaceutical, life science and clinical services community, with a focused expertise in commercialization, marketing strategy, drug development, operations, strategic planning and corporate and business development. From September 2011 to December 2016, Mr. Skolsky held senior executive roles at Quintiles Transnational Holdings Inc. (now IQVIA Holdings Inc.), a leading multinational provider of biopharmaceutical development services and commercial outsourcing service, most recently as Senior Vice President & Managing Director and previously, Senior Vice President and Head of Global Clinical Operations. Prior to joining Quintiles, from August 2007 to December 2009, he served as the President and Chief Executive Officer of Sequoia Pharmaceuticals, Inc., and from June 2004 to December 2006, he served as the Chief Executive Officer of Trimeris, Inc. Prior to that, Mr. Skolsky served for more than 20 years at GlaxoSmithKline plc where he held a number of positions including senior leadership roles as Managing Director of GlaxoSmithKline's operations in Australia and New Zealand and Senior Vice President, Global Product Strategy and Clinical Development. We believe that Mr. Skolsky's significant experience and leadership in the biotechnology

and pharmaceutical industries with a focus on drug development, commercialization and operations qualifies him to serve on our board of directors.

Paula Brown Stafford is our President and Chief Executive Officer and was appointed as Chairman of our board of directors effective July 28, 2020. Mrs. Stafford has served as our President since January 2019. Prior to her appointment as our Chief Executive Officer effective February 2, 2020, Mrs. Stafford served as our Chief Operating Officer from January 2019 to February 2020 after serving as our Chief Development Officer from March 2017 to January 2019. Mrs. Stafford has served as a member of our board of directors since August 2017. Prior to joining Novan, Mrs. Stafford held various roles of increasing importance at Quintiles Transnational Holdings Inc. (now IQVIA Holdings Inc.), a leading multinational provider of biopharmaceutical development services and commercial outsourcing services, since 1985, including serving as President of Clinical Development from 2010 to 2015, where she was responsible for all Phase I-IV clinical development operations globally and served on the Quintiles Executive Committee. Mrs. Stafford has served as an adjunct professor in Public Health Leadership at the Gillings School of Global Public Health at the University of North Carolina, Chapel Hill, and operates her own third-party consulting business. In early 2022, Mrs. Stafford joined the board of the Alliance For Multispecialty Research, LLC, a private clinical research company comprised of 16 experienced clinical research centers in the U.S. We believe that Mrs. Stafford's extensive experience and leadership in clinical research and pharmaceutical product development, along with her extensive executive experience and her service as our Chief Executive Officer, qualifies her to serve as Chairman of our board of directors.

James L Bierman was appointed to our board of directors in September 2020. Mr. Bierman served as President and Chief Executive Officer and as a member of the board of directors of Owens & Minor, Inc., a Fortune 500 company and a leading distributor of medical and surgical supplies, from September 2014 to June 2015. Previously, he served in various other senior roles at Owens & Minor, including President and Chief Operating Officer from August 2013 to September 2014, Executive Vice President and Chief Operating Officer from March 2012 to August 2013, Executive Vice President and Chief Financial Officer from April 2011 to March 2012 and Senior Vice President and Chief Financial Officer from June 2007 to April 2011. Earlier in his career, Mr. Bierman served as Executive Vice President and Chief Financial Officer at Quintiles Transnational Corp. (now IQVIA Holdings Inc.). Before joining Quintiles, Mr. Bierman was a partner with Arthur Andersen LLP from 1988 to 1998. Mr. Bierman currently serves on the board of directors of Tenet Healthcare Corporation, a public healthcare services companies listed on the New York Stock Exchange, MiMedX Group, Inc., a public biomedical company listed on the Nasdaq stock exchange, and KL Acquisition Corp., a special purpose acquisition company listed on the Nasdaq stock exchange, and previously served as Independent Lead Director on the board of directors of Team Health Holdings, Inc. We believe that Mr. Bierman's extensive board and executive experience, particularly in the healthcare and pharmaceutical services industries, as well as his substantial public accounting experience, qualifies him to serve on our board of directors.

Machelle Sanders joined our board of directors in September 2017 and is a seasoned executive with over 29 years of progressive pharmaceutical and biotechnology experience. Ms. Sanders is currently serving as the Secretary of the N.C. Department of Commerce, appointed by Governor Roy Cooper in February 2021. Prior to her appointment as the Secretary of the N.C. Department of Commerce, Ms. Sanders served as Secretary of the N.C. Department of Administration after being appointed by Governor Cooper in January 2017. In the private sector, Ms. Sanders was most recently responsible for the pharmaceutical operations and technology operational strategy at Biogen, Inc., a multinational biotechnology company, as vice president of quality assurance and vice president of manufacturing and general manager from 2009 to 2016. Ms. Sanders has also held leadership positions in manufacturing, global quality assurance and quality control at Biogen, Inc., Purdue Pharmaceuticals, a pharmaceutical company, and Diosynth-Akzu Nobel, a company that develops and offers manufacturing processes for active ingredients for pharmaceutical companies. Ms. Sanders currently serves on the board of directors of Radius Health, Inc. and BioCryst Pharmaceuticals, Inc., both of which are public biopharmaceutical companies listed on Nasdaq. We believe that Ms. Sanders' broad and extensive knowledge of pharmaceutical manufacturing and quality systems and leadership experience qualifies her to serve on our board of directors.

W. Kent Geer has served as a member of our board of directors since 2015 and as our Lead Independent Director since June 2017. Since 2016, Mr. Geer has served as managing director, finance and investor relations for Med1 Ventures, LLC, an early-stage medical device development company. Since March 2020, Mr. Geer has served as contract Chief Financial Officer for EternaTear, Inc., an early-stage medical product development company. Mr. Geer was an audit partner with Ernst & Young LLP from 1989 to 2011. Beginning in 2012, Mr. Geer served as the chairman of the board of directors of PowerSecure International, Inc. until the successful sale of the company in May 2016. Mr. Geer also serves on the board of directors of Utility Innovations Holdings, Inc., a privately held company in the energy services industry. We believe that Mr. Geer's significant experience and leadership in public accounting and the biotechnology, pharmaceutical and technology industries qualifies him to serve on our board of directors.

Robert J. Keegan has served as a member of our board of directors since 2016. Mr. Keegan held the roles of Chief Executive Officer and chairman of the board of directors of Goodyear Tire and Rubber Co. from 2003 to 2010. Most recently, he served as the non-executive chairman of the board of directors of Xerox Corporation and was an operating partner of the San Francisco-based private equity firm Friedman, Fleischer & Lowe. From 1972 to 2000, Mr. Keegan held various marketing, financial and managerial posts at Eastman Kodak, except for a two-year period from 1995 to 1997 when he worked as an executive vice president of the Avery Dennison Corporation. Mr. Keegan serves on the board of directors of the Heart Center of Duke University and the Duke Health Board of Visitors. Mr. Keegan is a partner of L&K Properties of North Carolina, LLC. We believe that Mr. Keegan's broad business experience, executive leadership expertise and extensive knowledge of financial and operational matters qualifies him to serve on our board of directors.

Executive Officers

Certain information regarding our executive officers is set forth below as of February 4, 2022. Executive officers are appointed by our board of directors to hold office until their successors are duly appointed and qualified, or until their resignation or removal.

Name	Age	Position(s)
Paula Brown Stafford	57	President, Chief Executive Officer and Chairman of the Board of Directors
John M. Gay	45	Chief Financial Officer
Brian M. Johnson	55	Chief Commercial Officer

For information regarding Mrs. Stafford, please refer to "Directors," above.

John M. Gay was appointed as our Chief Financial Officer in September 2020, and also serves as our principal financial officer and Corporate Secretary. He joined Novan in May of 2018 and previously held the position of Senior Director of Finance and Corporate Controller through January 2019, and Vice President, Finance and Corporate Controller from January 2019 until September 2020. Prior to Novan, Mr. Gay held previous director positions, including Director of SEC Reporting, with Valassis Digital Corp. and MaxPoint Inc., from May 2014 to April 2018. Mr. Gay also served as Corporate Controller of Furiex Pharmaceuticals, Inc. from June 2010 to May 2014, including from its initial listing on the Nasdaq stock exchange through the execution of an agreement providing for the acquisition of the company by Forest Laboratories, Inc., a subsidiary of Actavis plc, in an all-cash transaction valued at approximately $1.1 billion. Prior to joining Furiex Pharmaceuticals, Inc., Mr. Gay served as Audit Senior Manager and in other roles of increasing responsibilities at Deloitte and Arthur Andersen from September 2000 to May 2010. Mr. Gay is a certified public accountant and holds Bachelor's degrees in Economics and History, and a Master of Accounting degree from the University of North Carolina at Chapel Hill.

Brian M. Johnson was appointed as our Chief Commercial Officer effective November 1, 2021. In addition to previously serving as the Chief Commercial Officer at Novan from 2015 to 2018, Mr. Johnson most recently served as a Principal at Two Hearts Group, a pharmaceutical and life science consulting firm where he acted as UCB's Head, Digital Marketing, Psoriasis in the Global Mission for bimekizumab. Additionally, Mr. Johnson served as the Vice President of Prescription Marketing and Chief Digital Officer at Galderma, Mr. Johnson has also served as President at Revian, Inc, Director, Peer to Peer Marketing at Novartis and positions of increasing seniority at Ortho Pharmaceutical Corporation and Medicis. Mr. Johnson holds an MBA from Southern Methodist University and a BS in Business Administration from the University of Kansas. He is a member of the American Acne and Rosacea Society, Masters of Dermatologic Society, Women's Dermatology Society and the American Academy of Dermatology.

Audit Committee and Audit Committee Financial Experts

Our board of directors has a standing audit committee, which consists of W. Kent Geer, Robert J. Keegan, John Palmour and Steven D. Skolsky. The chair of our audit committee is W. Kent Geer, who our board of directors has determined is an "audit committee financial expert," as that term is defined by the rules of the SEC implementing Section 407 of the Sarbanes-Oxley Act, and possesses financial sophistication, as defined under the listing standards of the Nasdaq Capital Market. Our board of directors has also determined that each member of our audit committee can read and understand fundamental financial statements in accordance with applicable SEC and Nasdaq requirements. To arrive at these determinations, our board of directors has examined each audit committee member's scope of experience and the nature of his experience in the corporate finance sector.

Code of Business Conduct and Ethics

We have adopted a Code of Business Conduct and Ethics that applies to our directors, officers (including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions) and other employees. Our Code of Business Conduct and Ethics is available on the "Corporate Governance" page of the "Investor Relations" section of our website, which may be accessed by navigating to http://investors.novan.com/, by clicking the link under "Corporate Governance" and then by clicking on "Code of Business Conduct and Ethics" under "Governance Documents." We intend to post on our website and (if required) file on Form 8-K all disclosures that are required by applicable law, the rules of the SEC or the Nasdaq listing standards, concerning any amendment to, or waiver from, our Code of Business Conduct and Ethics. However, the reference to our website does not constitute incorporation by reference of the information contained on or available through our website, and you should not consider it to be a part of this Annual Report.

Item 11. Executive Compensation.

This section discusses the material components of the executive compensation program with respect to the 2021 fiscal year for the individual(s) who served as our principal executive officer during the year and our other most highly compensated executive officer(s) who was serving as an executive officer as of December 31, 2021. We refer to these persons as our "named executive officers" elsewhere in this Annual Report.

Our named executive officers for the 2021 fiscal year were:

- Paula Brown Stafford, *Chairman, President and Chief Executive Officer*;
- John M. Gay, *Chief Financial Officer and Corporate Secretary*; and
- Brian M. Johnson, *Chief Commercial Officer (as of November 1, 2021)*

Summary Compensation Table

The following table sets forth information concerning the compensation of our named executive officers for the years ended December 31, 2021 and December 31, 2020.

Name and Principal Position	Fiscal Year	Salary ($)	Bonus ($)	Option Awards ($)(1)	Non-Equity Incentive Plan Compensation ($)(2)	All Other Compensation ($)(3)	Total ($)
Paula Brown Stafford (4)	2021	$ 598,850	$ 389,253	$ 432,150	$ —	$ 18,780	$ 1,439,033
President and Chief Executive Officer (effective February 2, 2020)	2020	590,000	299,425	230,887	—	8,439	1,128,751
John M. Gay (5)	2021	318,544	146,421	308,049	—	17,300	790,314
Chief Financial Officer and Corporate Secretary (effective September 23, 2020)	2020	293,125	110,000	9,849	—	4,906	417,880
Brian M. Johnson (6)	2021	56,667	39,875	249,315	—	63,125	408,982
Chief Commercial Officer (effective November 1, 2021)	2020	—	—	—	—	—	—

(1) Amounts reflect the grant-date fair value of equity-based awards granted to our named executive officers, as applicable, including: (i) stock options in 2021 and 2020; and (ii) SARs in 2020. Both stock option and SARs fair values are estimated using the Black Scholes Option Pricing Model in accordance with ASC Topic 718, rather than the amounts paid to or realized by the named individual. For a discussion of the assumptions used to estimate the value of the options and SARs made to our named executive officers, see the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations—Critical Accounting Policies and Use of Estimates—Stock-Based Compensation" in this Annual Report, "Note 1—Organization and Significant Accounting Policies" and "Note 11—Stock-Based Compensation" to the accompanying consolidated financial statements included in this Annual Report.

(2) The Senior Executive Annual Incentive Plan expired by its terms at the Company's 2020 Annual Meeting of Stockholders, and thus, the Company did not award performance-based cash bonuses under the Company's Senior Executive Annual Incentive Plan in 2021 or 2020. For a description of the named executive officers' annual bonus opportunities, please review the section entitled "Executive Compensation—Narrative to Summary Compensation Table—Bonuses."

(3) All other compensation includes matching contributions made under our 401(k) plan for 2021 and Health Savings Account contributions for 2021 for Mrs. Stafford and Mr. Gay, and premiums for executive life insurance for the benefit of Mrs. Stafford in 2021. All other compensation includes matching contributions made under our 401(k) plan for Mrs. Stafford and Mr. Gay in 2020. In addition, prior to Mr. Johnson's commencement date as our Chief Commercial Officer, we made certain payments totaling $63,125 to Two Hearts Group, LLC, where Mr. Johnson is managing director, for consulting services rendered.

(4) Mrs. Stafford became our Chief Executive Officer effective February 2, 2020, and in connection therewith, Mrs. Stafford entered into an amended and restated employment agreement, as further amended by that first amended dated as of November 9, 2021, or the Stafford Employment Agreement, as described in further detail within the section entitled "Executive Compensation—Arrangements with our Named Executive Officers—Arrangements with Paula Brown Stafford."

(5) Mr. Gay was appointed as our Chief Financial Officer effective September 23, 2020, and we entered into a new employment agreement with Mr. Gay, as amended August 11, 2021, or the Gay Employment Agreement, as described in further detail within the section entitled "Executive Compensation—Arrangements with our Named Executive Officers—Arrangements with John M. Gay."

(6) Mr. Johnson was appointed as our Chief Commercial Officer effective November 1, 2021, and we entered into an employment agreement with Mr. Johnson, or the Johnson Employment Agreement, as described in further detail within the section entitled "Executive Compensation—Arrangements with our Named Executive Officers—Arrangements with Brian M. Johnson."

Narrative to Summary Compensation Table

Elements of Compensation

During 2021, we compensated our named executive officers through a combination of base salary, cash bonuses, long-term performance-based awards under the Performance Plan and 2016 Incentive Award Plan, or the 2016 Plan, and other perquisites and benefits as described below.

Please see the section entitled "Executive Compensation—Arrangements with our Named Executive Officers" in this Annual Report for further description of each named executive officer's employment agreement.

Annual Base Salaries

The named executive officers receive a base salary to compensate them for services rendered to us. The base salary payable to each named executive officer is intended to provide a fixed component of compensation reflecting the executive's skill set, experience, role(s) and responsibilities. In 2021, our named executive officers were entitled to the following total base salaries:

- Mrs. Stafford was entitled to $598,850 pursuant to the Stafford Employment Agreement;
- Mr. Gay was entitled to $318,544 pursuant to the Gay Employment Agreement; and
- Mr. Johnson was entitled to $56,667, which reflects the prorated amount of Mr. Johnson's $340,000 annual base salary for services rendered from November 1, 2021, through December 31, 2021, pursuant to the Johnson Employment Agreement.

Bonuses

Each named executive officer's employment agreement provided for certain cash bonuses for the year ended December 31, 2021, as described below:

- In 2021, the Stafford Employment Agreement provided Mrs. Stafford with an annual target cash bonus opportunity equal to not less than 55% and up to a maximum of 75% of her base salary, payable based on performance criteria. Our compensation committee has determined that Mrs. Stafford will receive a bonus of $389,253 for the year ended December 31, 2021, after determining that certain corporate performance objectives were achieved during 2021.
- In 2021, the Gay Employment Agreement provided Mr. Gay with an annual target cash bonus opportunity equal to 35% of his base salary, payable based on performance criteria. Our compensation committee has determined that Mr. Gay will receive a bonus of $111,421 for the year ended December 31, 2021, after determining that certain corporate performance objectives were achieved during 2021. In addition, on August 11, 2021, a $35,000 one-time payment was

approved for Mr. Gay related to a success bonus paid to employees following the announcement of the positive top-line results of the B-SIMPLE4 study.

- In 2021, the Johnson Employment Agreement provided Mr. Johnson with an annual target cash bonus opportunity equal to 35% of his base salary, payable based on performance criteria. Our compensation committee has determined that Mr. Johnson will receive a bonus of $14,875 for the year ended December 31, 2021, after determining that certain corporate performance objectives were achieved during 2021, as ratably adjusted based on his employment date during 2021. In addition, Mr. Johnson received a $25,000 one-time payment related to a signing bonus based on his employment during 2021.

Long-term Performance-based Compensation—2016 Incentive Award Plan

We currently sponsor the 2016 Plan, for purposes of granting stock options, SARs, and other equity-based instruments to our executive officers, directors and employees.

Initial and promotion option grants to our executive officers are generally set forth in their employment agreements. These initial and promotion grants are the product of negotiation with the executive officer, but we generally seek to establish equity ownership levels that we believe are commensurate with the equity positions held by executive officers serving in similar roles at comparable biopharmaceutical companies. Stock option grants made to our executive officers include (i) time-based vesting awards with vesting provisions ranging from six months to three years and (ii) awards that have also included performance-based vesting conditions.

In connection with entering into the amendment to the Stafford Employment Agreement, as discussed below, Mrs. Stafford was entitled to receive (i) 75,000 non-qualified stock options, which were granted in the fourth quarter of 2021 and (ii) an additional grant of 75,000 non-qualified stock options in January 2022.

In 2021, Mr. Gay received an option to purchase 37,750 shares of common stock and an option to purchase 2,500 shares of common stock, both granted in the second quarter of 2021.

In 2021, Mr. Johnson received an option to purchase 50,000 shares of common stock granted in the fourth quarter of 2021.

Long-term Performance-based Compensation—Performance Plan

In August 2018, our board of directors approved and established the Performance Plan, which is a performance-based long-term incentive plan. The Performance Plan is intended to tie long-term employee incentive compensation to specific, significant increases in our underlying common stock price and thus directly aligns employee and stockholder objectives. The Performance Plan provides for employees to receive long-term incentive compensation payments only if the established stock price targets ($111.70 per share and $254.50 per share, subject to adjustment) are achieved. The share prices described in the description of the Performance Plan in this Annual Report reflect the proportionate adjustment to reflect the impact of the Company's one-for-ten reverse stock split effective May 25, 2021.

The Performance Plan provides for the bonus pool to generally be paid in the form of cash. However, our compensation committee has discretion to pay any bonus award under the Performance Plan in the form of cash, shares of our common stock or a combination thereof, but only if our board of directors and stockholders approve the reservation of shares of our common stock for such payment.

The Performance Plan was effective immediately upon approval, expires on March 1, 2022, and covers all employees, including our executive officers, consultants and other persons deemed eligible by our compensation committee. If the Performance Plan's share price targets are not achieved by the expiration date of March 1, 2022, no established bonus awards will be disbursed under the plan. The fair value of all awards granted under the Performance Plan was zero as of December 31, 2021, as computed in accordance with ASC Topic 718. The Performance Plan was subsequently amended and restated to reflect minor changes in the timing for establishing minimum bonus amounts.

Our compensation committee has established that our named executive officers will receive the following minimum bonus amounts under the Performance Plan if the share price targets are achieved:

- In November 2018, our compensation committee established that, if the Performance Plan's first share price target of $111.70 per share is achieved, Mrs. Stafford would receive a minimum bonus amount under the Performance Plan of $500,000. If the Performance Plan's first share price target is not achieved, no bonus award will be disbursed. In January 2019, our compensation committee established that Mrs. Stafford would be entitled to an additional minimum

bonus amount of $250,000, bringing her total potential minimum bonus amount upon achievement of the first share price of $111.70 per share of common stock to $750,000. In June 2019, our compensation committee established that Mrs. Stafford would be entitled to an additional minimum bonus amount of $500,000, bringing her total potential minimum bonus amount upon achievement of the first share price of $111.70 per share of common stock to $1,250,000.

- In November 2018, our compensation committee established a minimum bonus amount under the Performance Plan of $150,000 for Mr. Gay. In January 2019, our compensation committee established that Mr. Gay would be entitled to an additional minimum bonus amount of $100,000, bringing his total potential minimum bonus amount upon achievement of the first share price of $111.70 per share of common stock to $250,000. In June 2019, our compensation committee established that Mr. Gay would be entitled to an additional minimum bonus amount of $250,000, bringing his total potential minimum bonus amount upon achievement of the first share price of $111.70 per share of common stock to $500,000.

Additionally, Mrs. Stafford, Mr. Gay and Mr. Johnson will also be eligible for consideration for a discretionary bonus under the Performance Plan to be determined by our compensation committee in connection with each share price target being earned.

Other Elements of Compensation

Retirement Plans

We currently maintain the Novan, Inc. 401(k) Plan, a defined contribution retirement savings plan, or the 401(k) Plan, for the benefit of our employees, including our named executive officers, who satisfy certain eligibility requirements. Our named executive officers were eligible to participate in the 401(k) Plan on the same terms as our other full-time employees. The Internal Revenue Code allows eligible employees to defer a portion of their compensation, within prescribed limits, on a pre-tax basis through contributions to the 401(k) Plan. Each participant in the 401(k) Plan was eligible to receive matching contributions of up to 3% in 2020, and up to 5% in 2021, of such participant's gross wages. These matching contributions are fully vested after one full year of employment. We believe that providing a vehicle for retirement savings though our 401(k) Plan and making matching contributions adds to the overall desirability of our executive compensation package and further incentivizes our employees, including our named executive officers.

Employee Benefits and Perquisites

All of our full-time employees, including our named executive officers, are eligible to participate in our health and welfare plans, including:

- medical, dental and vision benefits;
- medical and dependent care flexible spending accounts;
- short-term and long-term disability insurance; and
- life insurance.

In addition to the health and welfare benefits described above, certain named executive officers may participate in a company-paid executive life insurance plan. In 2021, we also paid certain executive life insurance premiums for the benefit of Mrs. Stafford. We generally do not provide any other perquisites to our named executive officers.

We believe the benefits and perquisites described above are necessary and appropriate to provide a competitive compensation package to our named executive officers.

No Tax Gross-Ups

We do not make gross-up payments to cover our named executive officers' personal income taxes that may pertain to any of the compensation or perquisites paid or provided by us.

Outstanding Equity Awards at Fiscal Year End

The following table provides information regarding outstanding equity awards held by our named executive officers as of December 31, 2021.

	Option Awards						Stock Awards		
Name	Grant Date		Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price ($/Share)	Option Expiration Date	Equity Incentive Plan Awards: Number of unearned shares, units or other right that have not vested (#)	Equity Incentive Plan Awards: Payout value of unearned shares, units or other right that have not vested ($)	
Paula Brown Stafford	03/20/17	(1)	5,400	—	$ 65.30	03/20/27			
Chairman, President and									
	08/25/17	(2)	3,050	—	42.70	08/14/27			
Chief Executive Officer	10/12/17	(3)	6,840	—	50.30	09/14/27			
	02/12/18	(4)	1,215	—	30.30	02/11/28			
	01/28/19	(5)	5,500	—	13.50	01/01/29			
	09/06/19	(6)	13,000	—	26.80	09/05/29			
	02/01/20	(7)	60,000	—	8.20	01/05/30			
	11/09/21	(15)	—	75,000	7.09	11/08/31			
	11/13/18	(8)					(9)	$ 1,250,000	(8)
John M. Gay	05/31/18	(10)	1,250	—	31.50	05/20/28			
Chief Financial Officer	11/16/18	(11)	250	—	24.30	11/12/28			
and Corporate Secretary	01/28/19	(12)	2,334	1,166	13.50	01/27/29			
	09/06/19	(6)	500	—	26.80	09/05/29			
	04/06/20	(13)	3,400	—	3.69	04/06/30			
	05/17/21	(16)	1,875	625	11.80	05/16/31			
	05/26/21	(17)	—	37,750	9.19	05/25/31			
	01/30/19	(14)					(9)	500,000	(14)
Brian M. Johnson	11/16/21	(18)	—	50,000	6.10	11/15/31			
Chief Commercial Officer							—	—	

(1) The option was granted under the 2016 Plan and vested six months from March 20, 2017.

(2) The option was granted under the 2016 Plan and vested in four equal quarterly installments, with the first installment vesting on September 5, 2017.

(3) The option was granted under the 2016 Plan and vested six months from vesting commencement date of September 15, 2017.

(4) The option was granted under the 2016 Plan and vested in thirty-six equal monthly installments on the first day of each month following February 12, 2018.

(5) This option was granted under the 2016 Plan, one-half vested six months from the January 2, 2019 vesting commencement date, and subsequent to the six-month anniversary of the vesting commencement date, one-twelfth vested each successive monthly anniversary following July 2, 2019.

(6) The option was granted under the 2016 Plan and vested in its entirety on June 25, 2020.

(7) The SARs were granted in connection with entering into the Stafford Employment Agreement and vested in equal quarterly installments over the initial term of the agreement, such that the SARs were fully vested on December 31, 2021.

(8) The amount reflects the minimum bonus amount payable to Mrs. Stafford as of December 31, 2021 under the Performance Plan if the first share price target of $111.70 per share is achieved. If the Performance Plan's first share price target is not achieved, no bonus award will be disbursed. See the section entitled "Executive Compensation—Narrative to Summary Compensation Table—Long-term Performance-based Compensation—Performance Plan" in this Annual Report for further information regarding the Performance Plan. In November 2018, our compensation committee established a minimum bonus amount under the Performance Plan of $500,000. In January 2019, our compensation

committee established that Mrs. Stafford would be entitled to an additional minimum bonus amount of $250,000 and in June 2019, our compensation committee established that Mrs. Stafford would be entitled to an additional minimum bonus amount of $500,000, bringing her total potential minimum bonus amount upon achievement of the first share price of $111.70 per share of common stock to $1,250,000.

(9) Minimum bonus amounts established by our compensation committee under the Performance Plan—the Performance Plan provides for the bonus pool to generally be paid in the form of cash, and awards are denominated in cash. Our compensation committee has discretion to pay any bonus award under the Performance Plan in the form of cash, shares of our common stock or a combination thereof, provided that our board and stockholders have approved the reservation of shares of our common stock for such payment. The Performance Plan expires March 1, 2022 and the fair value of these related awards as of December 31, 2021 was zero as computed in accordance with ASC Topic 718.

(10) The option was granted as an inducement grant in accordance with Nasdaq Listing Rule 5635(c)(4), and vested in three equal annual installments with the first installment vesting on May 21, 2019.

(11) The option was granted under the 2016 Plan and vested in three equal annual installments with the first installment vesting on November 13, 2019.

(12) The option was granted under the 2016 Plan and vests in three equal annual installments with the first installment vesting on January 28, 2020.

(13) The option was granted under the 2016 Plan, and one half vested on June 30, 2020, one quarter vested on September 30, 2020, and the remaining one quarter vested on December 31, 2020.

(14) The amount reflects the minimum bonus amount payable to Mr. Gay as of December 31, 2021 under the Performance Plan if the first share price target of $111.70 per share is achieved. See the section entitled "Executive Compensation—Narrative to Summary Compensation Table—Long-term Performance-based Compensation—Performance Plan" in this Annual Report for further information regarding the Performance Plan. In November 2018, our compensation committee established a minimum bonus amount under the Performance Plan of $150,000. In January 2019, our compensation committee established that Mr. Gay would be entitled to an additional minimum bonus amount of $100,000 and in June 2019, our compensation committee established that Mr. Gay would be entitled to an additional minimum bonus amount of $250,000, bringing his total potential minimum bonus amount upon achievement of the first share price of $111.70 per share of common stock to $500,000.

(15) The option was granted under the 2016 Plan and vests in three installments with one-half vesting upon the first anniversary of the grant date and one-half of the remaining options vesting on each of the next two anniversaries of the grant date.

(16) The option was granted under the 2016 Plan and vests in four equal quarterly installments with the first installment vesting on June 30, 2021.

(17) The option was granted under the 2016 Plan and vests in three equal annual installments with the first installment vesting on May 26, 2022.

(18) The option was granted under the 2016 Plan and vested in three equal annual installments with the first installment vesting on November 1, 2022.

Arrangements with our Named Executive Officers

We have entered into employment arrangements with our named executive officers that set forth certain terms and conditions of their employment, including base salary and employee benefits.

Arrangements with Paula Brown Stafford

Mrs. Stafford serves as our President and Chief Executive Officer and is compensated pursuant to the Stafford Employment Agreement. Pursuant to the Stafford Employment Agreement, Mrs. Stafford receives an annual base salary of $598,850 and is eligible to receive an annual performance-based bonus with a target bonus of 55% to 75% of her base salary. Mrs. Stafford is also eligible to participate in our incentive award plans. Mrs. Stafford continues to be eligible to participate in standard benefit plans as well as an executive life insurance plan, as well as for reimbursement of reasonable business expenses. In addition, our board of directors approved a stock appreciation right, or the Stafford SAR Award, for Mrs. Stafford under the 2016 Plan covering 60,000 shares of our common stock. The Stafford SAR Award was granted on a contingent basis and would have been considered irrevocably forfeited and voided in full if sufficient shares of our common stock were not available under the 2016 Plan or if we failed to obtain stockholder approval for amendments to the 2016 Plan at the next annual stockholders' meeting to provide sufficient shares for the Stafford SAR Award. In such event, we would have been required to pay Mrs. Stafford the cash-equivalent value of the amount that would have been due and payable per the Stafford SAR Award upon any properly noticed exercise of any vested portion of the Stafford SAR Award. Such condition was satisfied, and the SARs were no longer considered to be granted on a contingent basis, as of February 1, 2020. In connection with the amendment of the Stafford Employment Agreement in November 2021, Mrs. Stafford was awarded 75,000 nonqualified stock options to purchase shares of the Company's common stock in November 2021 and January 2022.

In the event of Mrs. Stafford's termination of employment either upon nonrenewal by the Company of the term of the Stafford Employment Agreement, by the Company without "cause" or by Mrs. Stafford for "good reason" (except as set forth below), then in addition to any accrued amounts and subject to Mrs. Stafford timely delivering an effective release of claims in the Company's favor and her continued compliance with the previously signed Restrictive Covenants Agreement between the Company and Mrs. Stafford, Mrs. Stafford will be entitled to receive payment of her then-current base salary, plus a prorated annual bonus calculated at the minimum target level of the calendar year in which the "separation date," as defined in the Stafford Employment Agreement, occurs based on the percentage of the calendar year actually worked by Mrs. Stafford as of the separation date, each multiplied by 1.5, plus the amount of any unpaid Annual Bonus for the prior calendar year. Such amounts will be paid in equal monthly installments over 12 months in accordance with standard payroll practices and provided, that to the extent that any such cash award constitutes nonqualified deferred compensation under Section 409A, the cash payment will be paid subject to any delay required by Section 409A. Mrs. Stafford will also be entitled to vesting of any then unvested portion of the Stafford SAR Award or any then unvested portion of any other equity award from the Company to give credit for the pro-rated portion of such equity awards for which Mrs. Stafford would have qualified based on service through the twelve-month period following the separation date, upon Mrs. Stafford's termination without "cause" or for "good reason" not due to a "change in control" (each as defined in the Stafford Employment Agreement) . Upon termination of employment by Mrs. Stafford other than for good reason or due to her death or disability, or by the Company for cause, Mrs. Stafford will not be entitled to any additional compensation beyond any accrued amounts.

Notwithstanding the foregoing, the Stafford Employment Agreement further provides that, in the event of a "double trigger" event, Mrs. Stafford will be entitled to receive payment of her then-current base salary, plus a prorated annual bonus calculated at the minimum target level of the calendar year in which the separation date occurs based on the percentage of the calendar year actually worked by Mrs. Stafford as of the separation date, each multiplied by 2.5, plus the amount of any unpaid Annual Bonus for the prior calendar year. Such amounts will be paid in equal monthly installments over 24 months in accordance with standard payroll practices and provided, that to the extent that any such cash award constitutes nonqualified deferred compensation under Section 409A, the cash payment will be paid subject to any delay required by Section 409A. Mrs. Stafford will also be entitled to vesting of any then unvested portion of the Stafford SAR Award and any other equity grant as of the separation date.

The following circumstances are considered a "double trigger" event:

(i) a "change in control," as defined in the Stafford Employment Agreement (which incorporates the definition from the 2016 Plan), and

(ii) Mrs. Stafford is terminated from employment by the Company without cause or upon the nonrenewal by the Company of the term of the Stafford Employment Agreement or by Mrs. Stafford for good reason (other than due to certain changes on the Company's board of directors) within 12 months after a change in control, subject to Mrs. Stafford timely delivering an effective release of claims in the Company's favor and her continued compliance with the Restrictive Covenants Agreement between the Company and Mrs. Stafford.

Arrangements with John M. Gay

Mr. Gay serves as our Chief Financial Officer and Corporate Secretary and is compensated pursuant to the Gay Employment Agreement. The Gay Employment Agreement may be terminated at-will by the Company or Mr. Gay at any time, for any or no

cause or reason, and with or without prior notice. Pursuant to the Gay Employment Agreement, Mr. Gay receives an annual base salary of $319,725, is eligible to receive an annual performance-based bonus with a target bonus equal to 35% of his base salary, is eligible to participate in the Company's incentive award plans and is entitled to the maximum amount of paid time-off allowed under the Company's policies. The Gay Employment Agreement also provides Mr. Gay with eligibility to participate in the Company's employee benefit plans, programs and arrangements as are provided generally from time to time to all other similarly situated employees of the Company, as well as for reimbursement of reasonable business expenses.

In the event of termination of Mr. Gay's employment by the Company without "cause" or by Mr. Gay for "good reason," in each case not in connection with a "change in control," with such terms as defined in the Gay Employment Agreement, then in addition to any accrued amounts and subject to Mr. Gay timely delivering an effective release of claims in the Company's favor and continued compliance with the existing Restrictive Covenants Agreements, as defined in the Gay Employment Agreement, Mr. Gay will be entitled to receive (i) payment of an amount equal to twelve months of his base salary, plus a prorated annual bonus, calculated at the target bonus level for the calendar year in which the separation date occurs based on the percentage of the calendar year actually worked by Mr. Gay as of the separation date, with such amount generally to be paid in equal installments over twelve months in accordance with the Company's standard payroll practices, (ii) vesting of any of Mr. Gay's then-unvested equity awards that would have otherwise vested through the end of the calendar year in which the separation date occurs, and (iii) reimbursement of a portion of Mr. Gay's applicable Consolidated Omnibus Budget Reconciliation Act of 1985, as amended, or COBRA, premiums for up to six months after such separation date. In the event of termination of Mr. Gay's employment by the Company without "cause" or by Mr. Gay for "good reason," at the time of or within twelve months after a "change in control," then in addition to any accrued amounts and subject to Mr. Gay timely delivering an effective release of claims in the Company's favor and continued compliance with the existing Restrictive Covenants Agreements, Mr. Gay will be entitled to receive (i) payment of an amount equal to twelve months of his base salary, plus an amount equal to an annual bonus calculated at the target bonus level for the calendar year in which the separation date occurs, with such amount generally to be paid in equal installments over twelve months in accordance with the Company's standard payroll practices, (ii) accelerated vesting of the remaining unvested portion of any and all equity awards issued to Mr. Gay as of the separation date and (iii) reimbursement of a portion of Mr. Gay's applicable COBRA premiums for up to twelve months after such separation date. In the event of termination of Mr. Gay's employment by the Company for "cause," by Mr. Gay other than for "good reason," or due to Mr. Gay's death or "disability," as defined in the Gay Employment Agreement, Mr. Gay will not be entitled to any additional compensation under the Gay Employment Agreement beyond any accrued amounts.

Arrangements with Brian M. Johnson

As of November 1, 2021, Mr. Johnson serves as our Chief Commercial Officer and is compensated pursuant to the Johnson Employment Agreement. The Johnson Employment Agreement may be terminated at-will by the Company or Mr. Johnson at any time, for any or no cause or reason, and with or without prior notice. Pursuant to the Johnson Employment Agreement, Mr. Johnson receives an annual base salary of $340,000, is eligible to receive an annual performance-based bonus with a target bonus equal to 35% of his base salary; provided, however, that immediately following the Company's commercial launch of SB206, and subject to achievement of sales targets to be agreed upon by the CEO, the target for the annual bonus will be increased to 50% of his base salary paid in the applicable calendar year. Mr. Johnson is eligible to participate in the Company's incentive award plans and is entitled to the maximum amount of paid time-off allowed under the Company's policies. The Johnson Employment Agreement also provides Mr. Johnson with eligibility to participate in the Company's employee benefit plans, programs and arrangements as are provided generally from time to time to all other similarly situated employees of the Company, as well as for reimbursement of reasonable business expenses.

In the event of termination of Mr. Johnson's employment by the Company without "cause" or by Mr. Johnson for "good reason," in each case not in connection with a "change in control," with such terms as defined in the Johnson Employment Agreement, then in addition to any accrued amounts and subject to Mr. Johnson timely delivering an effective release of claims in the Company's favor and continued compliance with the existing Restrictive Covenants Agreements, as defined in the Johnson Employment Agreement, Mr. Johnson will be entitled to receive (i) payment of an amount equal to twelve months of his base salary, plus a prorated annual bonus, calculated at the target bonus level for the calendar year in which the separation date occurs based on the percentage of the calendar year actually worked by Mr. Johnson as of the separation date, with such amount generally to be paid in equal installments over twelve months in accordance with the Company's standard payroll practices, (ii) vesting of any of Mr. Johnson's then-unvested equity awards that would have otherwise vested through the end of the calendar year in which the separation date occurs, and (iii) reimbursement of a portion of Mr. Johnson's applicable COBRA premiums for up to six months after such separation date. In the event of termination of Mr. Johnson's employment by the Company without "cause" or by Mr. Johnson for "good reason," at the time of or within twelve months after a "change in control," then in addition to any accrued amounts and subject to Mr. Johnson timely delivering an effective release of claims in the Company's favor and continued compliance with the existing Restrictive Covenants Agreements, Mr. Johnson will be entitled to receive (i) payment of an amount equal to twelve months of his base salary, plus an amount equal to an annual bonus

calculated at the target bonus level for the calendar year in which the separation date occurs, with such amount generally to be paid in equal installments over twelve months in accordance with the Company's standard payroll practices, (ii) accelerated vesting of the remaining unvested portion of any and all equity awards issued to Mr. Johnson as of the separation date and (iii) reimbursement of a portion of Mr. Johnson's applicable COBRA premiums for up to twelve months after such separation date. In the event that Mr. Johnson voluntarily resigns his employment after the date Mr. Johnson turns sixty years of age and after providing the Company with at least sixty days' written notice, then in addition to any accrued amounts and subject to Mr. Johnson timely delivering an effective release of claims in the Company's favor and continued compliance with the existing Restrictive Covenants Agreements, Mr. Johnson will be entitled to receive (i) payment of an amount equal to twelve months of his base salary (which for these purposes only shall be calculated based on the highest rate of base salary Mr. Johnson earns during the term of the Johnson Employment Agreement), plus an amount equal to an annual bonus calculated at the target bonus level for the calendar year in which the separation date occurs, with such amount generally to be paid in equal installments over twelve months in accordance with the Company's standard payroll practices, and (ii) accelerated vesting of any of Mr. Johnson's then-unvested equity awards that would have otherwise vested through the end of the calendar year in which the separation date occurs. In the event of termination of Mr. Johnson's employment by the Company for "cause," by Mr. Johnson other than for "good reason," or due to Mr. Johnson's death or "disability," as defined in the Johnson Employment Agreement, Mr. Johnson will not be entitled to any additional compensation under the Johnson Employment Agreement beyond any accrued amounts.

Director Compensation

The following table sets forth information concerning the compensation of our directors, other than Mrs. Stafford, for the year ended December 31, 2021.

Name	Fees Earned or Paid in Cash (1)	Option Awards (2)	Total
James L. Bierman	$ 56,250	$ 99,918	$ 156,168
W. Kent Geer	109,375	99,918	209,293
Robert J. Keegan	82,813	99,918	182,731
John Palmour	70,292	99,918	170,210
Machelle Sanders	59,375	99,918	159,293
Steven D. Skolsky (3)	40,760	140,756	181,516
Robert A. Ingram (4)	29,670	—	29,670

(1) Amounts reflected in this column include the fees earned during the fourth quarter ended December 31, 2020, but paid in cash to the applicable director during the year ended December 31, 2021, and fees earned during the fourth quarter ended December 31, 2021, but paid in cash to the applicable director during the year ended December 31, 2022. In this column we are required to report all fees either earned or paid to directors during 2021. As a result, fees earned in 2020 for fourth quarter service in 2020 but paid in 2021 are also included; thus the dollar amount represents fees paid for five (not four) successive quarters. Fees earned in 2020 but paid in 2021 were as follows: Mr. Bierman, $11,250; Mr. Geer, $21,875; Mr. Keegan, $16,563; Mr. Palmour, $13,438; Ms. Sanders, $11,875; and Mr. Ingram, $12,500.

(2) Amounts reflect the grant-date Black-Scholes value of stock awards and stock options granted during 2021, computed in accordance with ASC Topic 718, rather than the amounts paid to or realized by the named individual. For a discussion of the assumptions used to calculate the value of all stock awards and option awards made to our directors, see the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations—Critical Accounting Policies and Use of Estimates—Stock-Based Compensation" in this Annual Report, "Note 1—Organization and Significant Accounting Policies" and "Note 11—Stock-Based Compensation" to the accompanying consolidated

financial statements included in this Annual Report. These amounts do not necessarily correspond to the actual value that may be recognized from the option awards by the applicable directors.

(3) Mr. Skolsky was elected to the board of directors in March 2021 and received a pro-rated option award related to his appointment as a new director.

(4) Mr. Ingram completed his term of service on the board of directors and did not seek reelection at the 2021 annual meeting of stockholders.

The table below shows the aggregate numbers of option awards (exercisable and unexercisable) held as of December 31, 2021, by each director who served as a member of our board of directors during the year ended December 31, 2021, other than Mrs. Stafford. No such director held any other equity awards.

Name	Options Outstanding at Fiscal Year End December 31, 2021
James L. Bierman	14,423
W. Kent Geer	24,797
Robert J. Keegan	23,272
John Palmour	23,272
Machelle Sanders	20,347
Steven D. Skolsky	15,620
Robert A. Ingram	—

Non-Employee Director Compensation Policy

Effective March 1, 2021, we amended the Novan, Inc. Non-Employee Director Compensation Policy, or the Director Compensation Policy, for our non-employee directors that consists of annual retainer fees and equity awards that will be paid or made automatically and without further action by our board of directors. Pursuant to the Director Compensation Policy, subject to continued service on our board, (i) each non-employee director receives an annual cash retainer of $40,000; (ii) each non-employee director serving as a committee chair receives an additional annual retainer between $10,000 and $20,000; (iii) each non-employee director serving as a committee member (unless also serving as the committee chair) receives an additional annual retainer between $5,000 and $8,750, or in the event our board of directors creates a special committee, such additional cash compensation in the form of a retainer or a per meeting fee paid at the rate established by our board of directors at the time our board of directors establishes such committee; (iv) the non-employee chairman of our board of directors receives an additional annual retainer of $32,500; and (v) the lead independent director receives an additional annual retainer of $22,500. The Director Compensation Policy also provides each non-employee director with an annual equity award, contingent upon service on our board of directors as of the date of any annual meeting of our stockholders and continued service on our board of directors immediately following such annual meeting and automatically granted on the date of such annual meeting, of an option to purchase the number of shares of our common stock (at a per-share exercise price equal to the closing price per share of our common stock on the date of such annual meeting, or on the last preceding trading day if the annual meeting is not a trading day) equal to the number of shares that have an aggregate grant-date fair value of $100,000 (as determined in accordance with ASC Topic 718, with the number of shares of our common stock underlying each such award subject to adjustment as provided in the 2016 Plan); provided that at the discretion of the Compensation Committee and pursuant to the exercise of its business judgment, taking into account such factors, circumstances and considerations as it shall deem relevant from time to time, the Compensation Committee can impose a cap on the number of shares subject to such annual equity award. The equity awards described in the Director Compensation Policy are granted under and subject to the terms and provisions of the 2016 Plan or any other applicable Company equity incentive plan then-maintained by the Company. Each non-employee director who is initially elected or appointed on any date other than the date of an annual meeting of stockholders will receive a prorated portion of such annual equity award for the year of such election or appointment. Notwithstanding the foregoing, our board of directors in its sole discretion may determine that the annual equity award for any year or the prorated portion of any such annual equity award, as applicable, be granted in the form of restricted stock units with equivalent value on the date of grant. Each director equity award will vest and become exercisable in four equal quarterly installments, such that each such award shall be fully vested and exercisable on the first anniversary of the date of grant, subject to the director's continued service on our board of directors through each applicable vesting date.

Directors have been and will continue to be reimbursed for expenses directly related to their activities as directors, including attendance at board and committee meetings. Directors are also entitled to the protection provided by their indemnification agreements and the indemnification provisions in our certificate of incorporation and bylaws.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

EQUITY COMPENSATION PLAN INFORMATION

The following table presents information as of December 31, 2021, with respect to compensation plans under which shares of our common stock may be issued. The category "Equity Compensation Plans approved by security holders" in the table below consists of the 2016 Plan and the Company's 2008 Stock Plan, or the 2008 Plan. The table does not include the Performance Plan as no shares of our common stock have been authorized for issuance under that plan.

Plan Category	Number of Securities to be Issued upon Exercise of Outstanding Options and SARs (a)	Weighted Average Exercise Price of Outstanding Options and SARs ($)(b)	Number of Securities Remaining Available for Future Issuances under Equity Compensation Plans (excluding securities reflected in column (a)) (c)
Equity Compensation Plans approved by security holders	577,303 (1)	$ 14.68 (2)	1,213,224 (3)
Equity Compensation Plans not approved by security holders (4)	1,250	31.50	-
Total	578,553	14.72	1,213,224

(1) Includes shares of common stock issuable upon exercise of outstanding options under the 2008 Plan – 3,633 shares; and outstanding options and SARs under the 2016 Plan – 573,670 shares.

(2) The weighted-average remaining contractual term (in years) was 8.69.

(3) Includes shares remaining for future issuance under the 2016 Plan.

(4) In May 2018, we awarded nonstatutory stock options to purchase an aggregate of 10,050 shares of common stock to newly-hired employees, not previously employees or directors of the Company, as inducements material to the individuals' entering into employment with us within the meaning of Nasdaq Listing Rule 5635(c)(4), or the Inducement Grants. The Inducement Grants had a grant date of May 31, 2018 and an exercise price of $31.50 per share. The Inducement Grants were awarded outside of the 2016 Plan, pursuant to Nasdaq Listing Rule 5635(c)(4), but had terms and conditions generally consistent with our 2016 Plan and vested over three years, subject to the employee's continued service as an employee or consultant through the vesting period. As of December 31, 2021, there were a total of 1,250 Inducement Grants outstanding.

SECURITY OWNERSHIP OF MANAGEMENT AND CERTAIN BENEFICIAL OWNERS

The following table sets forth information regarding the beneficial ownership of our common stock as of February 4, 2022, by the following:

- each stockholder known by us to be the beneficial owner of more than 5% of our common stock;
- each of our directors;
- each of our named executive officers; and
- all of our directors and executive officers as a group.

Applicable percentages are based on 18,815,892 shares outstanding on February 4, 2022, adjusted as required by rules promulgated by the SEC.

The number of shares beneficially owned by each stockholder is determined under rules issued by the SEC. Under these rules, beneficial ownership includes any shares as to which the individual or entity has sole or shared voting power or investment power. The following table is based upon information supplied by officers, directors and principal stockholders and Schedules 13D and 13G filed with the SEC. In computing the number of shares beneficially owned by an individual or entity and the percentage ownership of that person, shares of common stock issuable upon the exercise of stock options or SARs or warrants exercisable within 60 days of February 4, 2022, are considered outstanding, although these shares are not considered outstanding for purposes of computing the percentage ownership of any other person. Unless otherwise indicated, the address of each of the individuals and entities named below is c/o Novan, Inc., 4020 Stirrup Creek Drive, Suite 110, Durham, NC 27703. Each of the stockholders listed has sole voting and investment power with respect to the shares beneficially owned by the stockholder unless noted otherwise, subject to community property laws where applicable.

Name of Beneficial Owner	Number of Shares Beneficially Owned	Percentage of Outstanding Shares
5% Stockholders:		
None	—	—
Directors and Named Executive Officers:		
Paula Brown Stafford (1)	110,074	*
John M. Gay (2)	12,900	*
Brian M. Johnson (3)	—	—
James L. Bierman (4)	11,317	*
W. Kent Geer (5)	23,273	*
Robert J. Keegan (6)	26,469	*
John Palmour (7)	117,009	*
Machelle Sanders (8)	18,641	*
Steven D. Skolsky (9)	12,514	*
All current directors and executive officers, as a group (9 persons) (10)	332,197	1.7%

* Represents beneficial ownership of less than one percent.

(1) Consists of (i) 15,069 shares of common stock held by Mrs. Stafford (ii) options to purchase 35,005 shares of common stock that are exercisable within 60 days of February 4, 2022 and (iii) 60,000 SARs exercisable within 60 days of February 4, 2022.

(2) Consists of (i) 1,500 shares of common stock held by Mr. Gay and (ii) options to purchase 11,400 shares of common stock that are exercisable within 60 days of February 4, 2022.

(3) Mr. Johnson was employed as Chief Commercial Officer on November 1, 2021.

(4) Consists of options to purchase 11,317 shares of common stock that are exercisable within 60 days of February 4, 2022.

(5) Consists of (i) 1,582 shares of common stock held by Mr. Geer and (ii) options to purchase 21,691 shares of common stock that are exercisable within 60 days of February 4, 2022.

(6) Consists of (i) 6,303 shares of common stock held by the Robert J. Keegan Trust, with Mr. Keegan as trustee and (ii) options to purchase 20,166 shares of common stock that are exercisable within 60 days of February 4, 2022.

(7) Consists of (i) 76,843 shares of common stock, of which 27,487 are held by the Palmour 2012 Irrevocable Children's Trust, with Dr. Palmour as trustee, (ii) warrants to purchase 20,000 shares of common stock that are exercisable within 60 days of February 4, 2022 and (iii) options to purchase 20,166 shares of common stock that are exercisable within 60 days of February 4, 2022.

(8) Consists of (i) 700 shares of common stock held by Ms. Sanders, (ii) warrants to purchase 700 shares of common stock that are exercisable within 60 days of February 4, 2022 and (iii) options to purchase 17,241 shares of common stock that are exercisable within 60 days of February 4, 2022.

(9) Consists of options to purchase 12,514 shares of common stock that are exercisable within 60 days of February 4, 2022.

(10) Consists of (i) 101,997 common shares held by our current executive officers and current directors, (ii) warrants to purchase 20,700 shares of common stock that are exercisable within 60 days of February 4, 2022 and (iii) options and SARs to purchase 209,500 shares of common stock exercisable within 60 days of February 4, 2022.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

Policies and Procedures for Related Party Transactions

Our board of directors has adopted a written related person transaction policy setting forth the policies and procedures for the review and approval or ratification of related person transactions. This policy covers, with certain exceptions set forth in Item 404 of Regulation S-K under the Securities Act, any transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships, in which we were or are to be a participant, the amount involved exceeds the lesser of (i) $120,000 or (ii) one percent of the average of our total assets at year-end for the last two completed fiscal years, and in which a related person had, has or will have a direct or indirect material interest, including without limitation, purchases of goods or services by or from the related person or entities in which the related person has a material interest, indebtedness, guarantees of indebtedness and employment by us of a related person. In reviewing and approving any such transactions, our audit committee is tasked to consider all relevant facts and circumstances, including, but not limited to, whether the transaction is on terms comparable to those that could be obtained in an arm's length transaction and the extent of the related person's interest in the transaction. All of the transactions described in this section either were approved or ratified pursuant to this policy or occurred prior to the adoption of this policy.

Certain Relationships and Related Transactions

The following includes a summary of transactions since January 1, 2019, to which we were or are to be a participant, in which the amount involved exceeded or will exceed the lesser of (i) $120,000 or (ii) one percent of the average of our total assets at year-end for the last two completed fiscal years, and in which any of our directors, executive officers or, to our knowledge, beneficial owners of more than 5% of our common stock or any member of the immediate family of any of the foregoing persons had or will have a direct or indirect material interest, other than equity and other compensation, termination, change in control and other arrangements, which are described in "Executive Compensation." We also describe below certain other transactions with our directors, executive officers and stockholders.

2020 Registered Direct Offering

On March 24, 2020, we entered into a securities purchase agreement with certain institutional investors, pursuant to which we agreed to sell and issue, in a registered direct offering priced at the market, an aggregate of 1,860,465 shares of our common stock (or pre-funded warrants to purchase shares of common stock in lieu thereof). The purchase price for each share of common stock was $4.30, and the price for each pre-funded warrant was $4.299. Each pre-funded warrant had an exercise price of $0.001 per share. The pre-funded warrants were exercisable immediately upon issuance until all of the pre-funded warrants were exercised in full.

In the offering, Sabby Volatility Warrant Master Fund, Ltd., a greater than 5% stockholder at the time of the offering, purchased 620,000 shares of common stock and pre-funded warrants to purchase up to 260,233 shares of common stock for approximately $3.8 million. Based solely on information reported in a Schedule 13G/A filed with the SEC on January 5, 2021, Sabby no longer held any of our common stock or pre-funded warrants to purchase shares of our common stock as of that date.

Joseph Moglia, a greater than 5% stockholder at the time of the offering, purchased 100,000 shares of common stock for $430,000. Based solely on information reported in a Schedule 13D/A filed with the SEC on January 27, 2021, Mr. Moglia was no longer a greater than 5% stockholder as of that date.

Reedy Creek Investments

On April 29, 2019, we entered into a royalty and milestone payments purchase agreement, or the Purchase Agreement, with Reedy Creek Investments LLC, or Reedy Creek, which beneficially owned greater than 5% of our outstanding stock at the time of the transaction. Based solely on information reported in a Schedule 13D/A filed with the SEC on June 24, 2021, Reedy Creek was no longer a greater than 5% stockholder as of that date. Pursuant to the Purchase Agreement, Reedy Creek provided funding in an initial amount of $25.0 million, which we used primarily to pursue the development, regulatory approval and commercialization activities for certain of our product candidates for certain indications, namely SB206, SB414 and SB204.

Pursuant to the Purchase Agreement, we will pay Reedy Creek ongoing quarterly payments, calculated based on an applicable percentage per product, of any upfront fees, milestone payments, royalty payments or equivalent payments received by us pursuant to any out-license agreement for the Products in the United States, Mexico or Canada, net of any upfront fees, milestone payments, royalty payments or equivalent payments paid by us to third parties pursuant to any agreements under which we have in-licensed intellectual property with respect to the Products in the United States, Mexico or Canada. Please see "Note 6—Research and Development Arrangements" to the accompanying consolidated financial statements included in this Annual Report for additional information regarding the research and development arrangements with Reedy Creek, including our obligations under this agreement.

Arrangements with Executive Officers and Directors

We have entered into employment arrangements with our named executive officers. For more information regarding our arrangements with our named executive officers, see the section entitled "Executive Compensation—Arrangements with our Named Executive Officers."

We have entered, or will enter, into an indemnification agreement with each of our directors and executive officers. The indemnification agreements and our bylaws require us to indemnify our directors and officers to the fullest extent permitted by Delaware law.

Independence of Directors

Our common stock is listed on the Nasdaq Capital Market. Under the listing requirements and rules of the Nasdaq Capital Market, independent directors must comprise a majority of our board of directors, and each member of our audit committee, compensation committee and nominating and governance committee must be independent. Under the rules of the Nasdaq Capital Market, a director will only qualify as an "independent director" if, in the opinion of that company's board of directors, that person does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director.

Audit committee members must also satisfy independence criteria set forth in Rule 10A-3 under the Exchange Act. To be considered independent for purposes of Rule 10A-3, a member of an audit committee of a listed company may not, other than in his or her capacity as a member of a company's audit committee, the company's board of directors or any other board committee, (i) accept, directly or indirectly, any consulting, advisory or other compensatory fee from the listed company or any of its subsidiaries or (ii) be an affiliated person of the listed company or any of its subsidiaries.

Our board of directors has undertaken a review of its composition, the composition of its committees 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 family relationships, our board of directors has determined that James L. Bierman, W. Kent Geer, Robert J. Keegan, John Palmour, Machelle Sanders and Steven D. Skolsky, and that Robert A. Ingram, during his service on the board through the 2021 annual stockholder meeting, do not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director and that each of these directors is "independent" as that term is defined under the applicable rules and regulations of the listing requirements and rules of the Nasdaq Capital Market. In making these determinations, our board of directors considered the current and prior relationships that each non-employee director has with us and all other facts and circumstances our board of directors deemed relevant in determining their independence, including the beneficial ownership of our capital stock by each non-employee director.

Our board of directors determined that W. Kent Geer, Robert J. Keegan, John Palmour and Steven D. Skolsky, each of the four members of our audit committee, satisfy the independence standards for our audit committee established by applicable SEC rules and the listing standards of the Nasdaq Capital Market and Rule 10A-3.

Our board of directors has determined that Robert J. Keegan, James L. Bierman and Machelle Sanders, each of the three current members of our compensation committee, and W. Kent Geer, who served on the compensation committee until February 18,

2022, satisfy the independence standards for our compensation committee established by applicable SEC Rules and the listing standards of the Nasdaq Capital Market, taking into consideration all factors specified in the applicable standards.

Our board of directors has determined that John Palmour and James L. Bierman, each of the two members of our nominating and corporate governance committee, are independent within the meaning of the applicable listing standards of the Nasdaq Capital Market.

Item 14. Principal Accountant Fees and Services.

Principal Accountant Fees and Services

The following table represents the aggregate fees and expenses for services provided by BDO USA, LLP, or BDO, our independent registered public accounting firm for the fiscal years ended December 31, 2021 and 2020.

	Fiscal Year Ended	
	2021	2020
	(in thousands)	
Audit Fees (1)	$ 326	$ 310
Audit-Related Fees	—	—
Tax Fees	—	—
All Other Fees	—	—
Total Fees	$ 326	$ 310

1. Audit fees consist of fees billed, or expected to be billed, for professional services rendered for the audit of our consolidated annual financial statements, review of the interim consolidated financial statements, the issuance of consent and comfort letters in connection with registration statement filings with the SEC and all services that are normally provided by the accounting firm in connection with statutory and regulatory filings or engagements. Audit fees for the fiscal year ended December 31, 2020 also include additional fees related to the restatement of our historical financial statements.

All fees described above were approved by our audit committee.

Pre-Approval Policies and Procedures

Our audit committee has adopted a policy and procedures for the pre-approval of audit and non-audit services rendered by our independent registered public accounting firm. The policy generally pre-approves specified services in the defined categories of audit services, audit-related services and tax services up to specified amounts. Pre-approval may also be given as part of our audit committee's approval of the scope of the engagement of the independent auditor or on an individual, explicit, case-by-case basis before the independent auditor is engaged to provide each service. The pre-approval of services may be delegated to one or more of our audit committee's members, but the decision must be reported to the full audit committee at its next scheduled meeting.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

(a) The following financial statements are included in this Annual Report:

(1) List of Financial Statements:

The financial statements required by this item are listed in Item 8, "Financial Statements and Supplementary Data" herein.

(2) List of Financial Statement Schedules:

All financial statement schedules have been omitted because they are not applicable, not required or the information required is shown in the financial statements or notes thereto.

(3) List of Exhibits.

				INCORPORATED BY REFERENCE			
EXHIBIT NO.		DESCRIPTION	Filed Herewith	FORM	File No.	Exhibit	Filing Date
3.1		Restated Certificate of Incorporation of Novan, Inc., effective September 26, 2016.		8-K	001-37880	3.1	September 27, 2016
3.2		Certificate of Amendment to the Restated Certificate of Incorporation of Novan, Inc., effective May 25, 2021.		8-K	001-37880	3.1	May 25, 2021
3.3		Amended and Restated Bylaws of Novan, Inc., effective September 26, 2016.		8-K	001-37880	3.2	September 27, 2016
4.1		Form of Common Stock Certificate.		S-1/A	333-213276	4.1	September 8, 2016
4.2		Description of Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934.	X				
4.3		Registration Rights Agreement, dated August 30, 2019, by and between Novan, Inc. and Aspire Capital Fund, LLC.		8-K	001-37880	4.1	September 5, 2019
4.4		Registration Rights Agreement, dated July 21, 2020, by and between Novan, Inc. and Aspire Capital Fund, LLC.		8-K	001-37880	4.1	July 22, 2020
4.5		Form of March 2020 Public Offering Common Warrant.		8-K	001-37880	4.1	March 3, 2020
4.6		Form of March 2020 Public Offering Pre-Funded Warrant.		8-K	001-37880	4.2	March 3, 2020
4.7		Form of March 2020 Public Offering Underwriter Warrant.		8-K	001-37880	4.3	March 3, 2020
4.8		Form of March 2020 Registered Direct Offering Pre-Funded Warrant.		8-K	001-37880	4.1	March 26, 2020
4.9		Form of March 2020 Registered Direct Offering Placement Agent Warrant.		8-K	001-37880	4.2	March 26, 2020
10.1	#	Form of Director and Executive Officer Indemnification Agreement.		10-Q	001-37880	10.6	October 30, 2020
10.2	#	2008 Stock Plan, as amended, and form of option agreements thereunder.		S-1	333-213276	10.2	August 24, 2016

EXHIBIT NO.		DESCRIPTION	Filed Herewith	INCORPORATED BY REFERENCE			
				FORM	File No.	Exhibit	Filing Date
10.3	#	2016 Incentive Award Plan, as amended and restated.		8-K	001-37880	10.1	May 25, 2021
10.4	#	Tangible Stockholder Return Plan, dated August 2, 2018 as amended and restated.		10-Q	001-37880	10.2	May 25, 2021
10.5	#	Form of Award Agreement Awarding Non-Qualified Stock Options to Employees under the Novan, Inc. 2016 Incentive Award Plan.		10-Q	001-37880	10.1	November 14, 2016
10.6	#	Form of Award Agreement Awarding Incentive Stock Options to Employees under the Novan, Inc. 2016 Incentive Award Plan.		10-Q	001-37880	10.2	November 14, 2016
10.7	#	Form of Award Agreement Awarding Non-Qualified Stock Options to Non-Employee Directors under the Novan, Inc. 2016 Incentive Award Plan.		10-Q	001-37880	10.3	November 14, 2016
10.8	#	Form of Employment Inducement Stock Option Agreement.		10-Q	001-37880	10.3	August 8, 2018
10.9	#	Amended and Restated Employment Agreement dated December 17, 2019, by and between Novan, Inc. and Paula Brown Stafford.		10-K	001-37880	10.12	February 24, 2020
10.10	#	First Amendment, dated November 9, 2021, to Amended and Restated Employment Agreement dated December 17, 2019, by and between Novan, Inc. and Paula Brown Stafford.		10-Q	001-37880	10.1	November 10, 2021
10.11	#	Stock Appreciation Right Grant Notice and Agreement between Novan, Inc. and Paula Brown Stafford.		10-K	001-37880	10.13	February 24, 2020
10.12	#	Employment Agreement, dated September 23, 2020, by and between Novan, Inc. and John M. Gay.		8-K	001-37880	10.2	September 24, 2020
10.13	#	First Amendment, dated August 11, 2021, to Employment Agreement, dated September 23, 2020, by and between Novan, Inc. and John M. Gay.		10-Q	001-37880	10.3	August 12, 2021
10.14	#	Employment Agreement, dated November 1, 2021, by and between Novan, Inc. and Brian M. Johnson.	X				
10.15	#	Non-Employee Director Compensation Policy.		8-K	001-37880	10.1	March 2, 2021
10.16	†	Amended, Restated and Consolidated License Agreement between The University of North Carolina and Novan, Inc., dated as of June 27, 2012, and as amended on November 30, 2012.		S-1/A	333-213276	10.7	September 8, 2016

EXHIBIT NO.		DESCRIPTION	Filed Herewith	INCORPORATED BY REFERENCE			
				FORM	File No.	Exhibit	Filing Date
10.17	†	Second Amendment, dated April 12, 2016, to the Amended, Restated and Consolidated License Agreement between The University of North Carolina and Novan, Inc., dated as of June 27, 2012.		10-Q	001-37880	10.4	November 14, 2016
10.18	†	Third Amendment, dated November 1, 2018, to the Amended, Restated and Consolidated License Agreement between The University of North Carolina and Novan, Inc., dated as of June 27, 2012.		10-K	001-37880	10.23	March 27, 2019
10.19	††	Fourth Amendment, dated November 26, 2018, to the Amended, Restated and Consolidated License Agreement between the University of North Carolina and Novan, Inc., dated as of June 27, 2012.	X				
10.20	††	Fifth Amendment, dated September 24, 2021, to the Amended, Restated and Consolidated License Agreement between the University of North Carolina and Novan, Inc., dated as of June 27, 2012.	X				
10.21	†	UNC Sublicense Agreement, dated December 29, 2015, by and between Novan, Inc. and KNOW Bio, LLC.		S-1	333-213276	10.8	August 24, 2016
10.22	†	First Amendment, dated October 13, 2017, to the UNC Sublicense Agreement, dated December 29, 2015, by and between Novan, Inc. and KNOW Bio, LLC.		10-K	001-37880	10.21	March 27, 2018
10.23	†	Second Amendment, dated November 2, 2018, to the UNC Sublicense Agreement, dated December 29, 2015, by and between Novan, Inc. and KNOW Bio, LLC.		10-K	001-37880	10.26	March 27, 2019
10.24	†	Novan Patent and Know-How License Agreement, dated December 29, 2015, by and between Novan, Inc. and KNOW Bio, LLC.		S-1	333-213276	10.9	August 24, 2016
10.25	†	First Amendment, dated October 13, 2017, to the Novan Patent and Know-How License Agreement, dated December 29, 2015, by and between Novan, Inc. and KNOW Bio, LLC.		10-K	001-37880	10.23	March 27, 2018
10.26	†	Second Amendment, dated November 2, 2018 to the Novan Patent and Know-How License Agreement, dated December 29, 2015, by and between Novan, Inc. and KNOW Bio, LLC.		10-K	001-37880	10.29	March 27, 2019

EXHIBIT NO.		DESCRIPTION	Filed Herewith	INCORPORATED BY REFERENCE			
				FORM	File No.	Exhibit	Filing Date
10.27	†	License Agreement, dated January 12, 2017, by and between Novan, Inc. and Sato Pharmaceutical Co. Ltd.		10-K	001-37880	10.17	March 20, 2017
10.28	†	First Amendment, dated January 12, 2017 to the License Agreement, dated January 12, 2017, by and between Novan, Inc. and Sato Pharmaceutical Co. Ltd.		10-K	001-37880	10.18	March 20, 2017
10.29	†	Second Amendment, dated October 5, 2018 to the License Agreement, dated January 12, 2017, by and between Novan, Inc. and Sato Pharmaceutical Co. Ltd.		10-Q	001-37880	10.1	November 5, 2018
10.30	††	Royalty and Milestone Payments Purchase Agreement, dated April 29, 2019, by and between Novan, Inc. and Reedy Creek Investments LLC.	X				
10.31	††	Development Funding and Royalties Agreement, dated May 4, 2019, by and between Novan, Inc. and Ligand Pharmaceuticals Incorporated.	X				
10.32		Common Stock Purchase Agreement, dated July 21, 2020, by and between Novan, Inc. and Aspire Capital Fund, LLC.		8-K	001-37880	10.1	July 22, 2020
10.33		Paycheck Protection Program Term Note, dated April 22, 2020, in favor of PNC Bank, National Association.		8-K	001-37880	10.1	April 23, 2020
10.34		Letter Amendment, dated August 20, 2020, to the Paycheck Protection Term Note, dated April 22, 2020, in favor of PNC Bank, National Association.		10-Q	001-37880	10.1	October 30, 2020
10.35		Lease, dated January 18, 2021, by and between Novan, Inc. and Copper II 2020, LLC, and as amended by the First Amendment to Lease as of March 18, 2021.		10-Q	001-37880	10.1	May 11, 2021
23.1		Consent of BDO USA, LLP.	X				
31.1		Certification of Chief Executive Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	X				
31.2		Certification of Chief Financial Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	X				

EXHIBIT NO.	DESCRIPTION	Filed Herewith	INCORPORATED BY REFERENCE			
			FORM	File No.	Exhibit	Filing Date
32.1	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X				
32.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X				
101.INS	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.	X				
101.SCH	Inline XBRL Taxonomy Extension Schema Document.	X				
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.	X				
101.DEF	Inline XBRL Taxonomy Extension Definition Document.	X				
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document.	X				
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.	X				
104	Cover Page Interactive Data File - the cover page XBRL tags are embedded within the Inline XBRL Instance document included in Exhibit 101.	X				

† Confidential treatment has been granted with respect to certain portions of this exhibit. Omitted portions have been filed separately with the Securities and Exchange Commission.

†† Certain confidential information contained in these exhibits were omitted by means of redacting a portion of the text and replacing it with [***], pursuant to Regulation S-K Item 601(b) of the Securities Act of 1933, as amended. Certain confidential information has been excluded from the respective exhibits because it is: (i) not material; and (ii) the Company treats such information as private or confidential.

# Indicates management contract or compensatory plan.

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 Annual Report to be signed on its behalf by the undersigned, thereunto duly authorized.

Novan, Inc.

Date: February 18, 2022

By: /s/ Paula Brown Stafford
Paula Brown Stafford
Chairman, President and Chief Executive Officer
(Principal Executive Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Annual Report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Name	Title	Date
/s/ Paula Brown Stafford **Paula Brown Stafford**	Chairman, President, Chief Executive Officer (Principal Executive Officer)	February 18, 2022
/s/ John M. Gay **John M. Gay**	Chief Financial Officer (Principal Financial Officer)	February 18, 2022
/s/ Andrew J. Novak **Andrew J. Novak**	Vice President, Accounting and Business Operations (Principal Accounting Officer)	February 18, 2022
/s/ James L. Bierman **James L. Bierman**	Director	February 18, 2022
/s/ W. Kent Geer **W. Kent Geer**	Director	February 18, 2022
/s/ Robert J. Keegan **Robert J. Keegan**	Director	February 18, 2022
/s/ John Palmour **John Palmour**	Director	February 18, 2022
/s/ Machelle Sanders **Machelle Sanders**	Director	February 18, 2022
/s/ Steven D. Skolsky **Steven D. Skolsky**	Director	February 18, 2022

DESCRIPTION OF REGISTRANT'S SECURITIES REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

The following description of our capital stock and certain provisions of our restated certificate of incorporation and our amended and restated bylaws is not complete and may not contain all the information you should consider before investing in our capital stock. This description is summarized from, and qualified in its entirety by reference to, our restated certificate of incorporation and amended and restated bylaws, each of which has been publicly filed with the SEC. See Exhibits 3.1 and 3.2, respectively, to the Annual Report on Form 10-K that links to this exhibit. Unless the context otherwise requires, all references to "we", "us", the "Company", or "Novan" in this Exhibit 4.2 refer to Novan, Inc.

Our authorized capital stock consists of:

- 200,000,000 shares of common stock, par value $0.0001 per share, of which we had outstanding 18,815,892 shares of our common stock as of December 31, 2021; and
- 10,000,000 shares of preferred stock, par value $0.0001 per share, of which none were outstanding as of December 31, 2021.

Common Stock

Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders shall be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Holders of common stock are entitled to receive proportionately any dividends as may be declared by our board of directors, subject to any preferential dividend rights of any series of preferred stock that we may designate and issue in the future.

In the event of our liquidation or dissolution, the holders of common stock are entitled to receive proportionately our net assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock. Holders of common stock have no preemptive, subscription, redemption or conversion rights. Our outstanding shares of common stock are, and the shares offered by us in this offering will be, when issued and paid for, validly issued, fully paid and nonassessable. The rights, preferences and privileges of holders of common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Our common stock is listed on the Nasdaq Capital Market under the symbol "NOVN."

The Company is permitted to issue, and has from time to time, issued warrants and options to purchase shares of the Common Stock, as well as stock appreciation rights.

Transfer Agent

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC.

Preferred Stock

Under the terms of our restated certificate of incorporation, our board of directors is authorized to direct us to issue shares of preferred stock in one or more series without stockholder approval. Our board of directors has the discretion to determine the rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences, of each series of preferred stock. The preferred shares may have voting or conversion rights that could have the effect of restricting dividends on our common shares, diluting the voting power of our common shares, impairing the rights of our common shares in the event of our dissolution, liquidation or winding-up or otherwise adversely affect the rights of holders of our common shares. The holders of preferred shares are entitled to receive notice of any meeting of our shareholders and to attend and vote, except as otherwise provided in the rights and restrictions attached to the shares by the board of directors.

Anti-Takeover Effects of Delaware Law and Our Certificate of Incorporation and Bylaws

Restated Certificate of Incorporation and Amended and Restated Bylaws

Because our stockholders do not have cumulative voting rights, our stockholders holding a majority of the voting power of our shares of common stock outstanding will be able to elect all of our directors. Our restated certificate of incorporation and amended and restated bylaws provide that all stockholder actions must be effected at a duly called meeting of stockholders and not by consent in writing. A special meeting of stockholders may be called only by a majority of our board of directors, the chair of our board of directors, our president or our chief executive officer.

Our restated certificate of incorporation further provides that the affirmative vote of holders of at least sixty-six and two-thirds percent (66-2/3%) of the voting power of all of the then outstanding shares of voting stock, voting as a single class, will be required to amend certain provisions of our certificate of incorporation, including provisions relating to the size of the board, removal of directors, special meetings, actions by written consent and cumulative voting. The affirmative vote of holders of at least sixty-six and two-thirds percent (66-2/3%) of the voting power of all of the then outstanding shares of voting stock, voting as a single class, will be required to amend or repeal our bylaws, although our bylaws may be amended by a simple majority vote of our board of directors.

Our restated certificate of incorporation further provides that our board of directors is divided into three classes, Class I, Class II and Class III, with each class serving staggered terms.

Finally, our restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for: (i) any derivative action or proceeding brought on behalf of us; (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees or agents to us or our stockholders; (iii) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law or our restated certificate of incorporation or amended and restated bylaws; or (iv) any action asserting a claim against us governed by the internal affairs doctrine. These choice of forum provisions do not preclude or contract the scope of exclusive federal or concurrent jurisdiction for any actions brought under the Securities Act or the Exchange Act. Accordingly, our choice of forum provisions will not relieve us of our duties to comply with the federal securities laws and the rules and regulations thereunder, and our stockholders will not be deemed to have waived our compliance with these laws, rules and regulations. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with any action, a court could find the choice of forum provisions contained in our restated certificate of incorporation to be inapplicable or unenforceable in such action. Nonetheless, any person or entity purchasing or otherwise acquiring any interest in any of our securities shall be deemed to have notice of and consented to these provisions. These choice of forum provisions may limit a stockholder's ability to bring a claim in a judicial forum of its choosing for disputes with us or our directors, officers or other employees or agents, which may discourage lawsuits against us and our directors, officers and other employees or agents.

The foregoing provisions, including the choice of forum provisions, will make it more difficult for our existing stockholders to replace our board of directors as well as for another party to obtain control of our company by replacing our board of directors. Since our board of directors has the power to retain and discharge our officers, these provisions could also make it more difficult for existing stockholders or another party to effect a change in management. In addition, the authorization of undesignated preferred stock makes it possible for our board of directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to change the control of our company.

These provisions are intended to enhance the likelihood of continued stability in the composition of our board of directors and its policies and to discourage certain types of transactions that may involve an actual or threatened acquisition of our Company. These provisions are also designed to reduce our vulnerability to an unsolicited acquisition proposal and to discourage certain tactics that may be used in proxy fights. However, these provisions could have the effect of discouraging others from making tender offers for our shares and may have the effect of deterring hostile takeovers or delaying changes in control of our Company or our management. As a consequence, these provisions also may inhibit fluctuations in the market price of our stock that could result from actual or rumored takeover attempts.

Section 203 of the Delaware General Corporation Law

We are subject to Section 203 of the Delaware General Corporation Law, which prohibits persons deemed to be "interested stockholders" from engaging in a "business combination" with a publicly held Delaware corporation for three years following the date these persons become interested stockholders unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. Generally, an "interested stockholder" is a person who, together with affiliates and associates, owns, or within three years prior to the determination of interested stockholder status did own, 15% or more of a corporation's voting stock. Generally, a "business combination" includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. The existence of this provision may have an anti-takeover effect with respect to transactions not approved in advance by the board of directors.

Execution Copy

EMPLOYMENT AGREEMENT

This Employment Agreement (the "Agreement") is entered into as of November 1, 2021 (the "Effective Date") by and between Novan, Inc., a Delaware corporation with its principal place of business in Durham County, North Carolina (the "Company"), and Brian M. Johnson ("Executive"). Executive and the Company may be referred to individually as a "party" and collectively as the "parties."

WITNESSETH:

WHEREAS, the Company wishes to employ Executive as its Chief Commercial Officer and Executive wishes to accept such employment, commence on November 1, 2021;

WHEREAS, the Company and Executive have negotiated the terms of Executive's employment, as set forth in this Agreement; and

WHEREAS, as a condition of Executive's employment, Executive will also execute contemporaneously with this Agreement the Confidentiality an Assignment of Inventions Agreement and the Noncompetition Agreement (collectively the "Restrictive Covenants Agreements"); and

WHEREAS, Executive acknowledges and agrees that the compensation and benefits provided under this Agreement are more than adequat consideration for Executive's execution of the Restrictive covenants Agreements.

NOW, THEREFORE, in consideration of the foregoing, the mutual promises herein contained, and other good and valuable consideration, includi the employment of Executive by the Company, the receipt and sufficiency of which are hereby acknowledged, the parties hereto, intending to be legally bound, hereby agree as follows.

1. EMPLOYMENT. As of the Effective Date, Executive shall serve as the Company's Chief Commercial Officer ("CCO"), reporting to the Company's President and Chief Executive Officer, upon the terms and conditions hereinafter set forth.

2. DUTIES; EXCLUSIVE SERVICE.

    a. Executive shall faithfully discharge his responsibilities and perform all duties prescribed to him by the Company's Chief Executive Officer (the "CEO"), as well as any duties as are set forth in the Bylaws of the Company related to Executive's position. In addition, Executive expressly agrees that his services include but are not limited to attendance at scheduled meetings of the Company's Board of Directors (the "Board") and all other normal duties associated with the responsibilities of a Chief Commercial Officer. Executive agrees to comply with all Company policies, standards and regulations now existing or hereafter promulgated. Executive further agrees to devote all of his working time and attention to the performance of his duties and responsibilities on behalf of the Company and in furtherance of its best interests. Notwithstanding the foregoing, Executive may serve on boards or advisory committees without compensation of non-profit or charitable organizations and, with the prior written consent of the CEO, boards or advisory committees of for-profit organizations or companies, in each case, so long as

such service and obligations do not interfere with Executive's duties at the Company. During the Term, Executive agrees to immediately resign from the board of any company that engages in any business that competes with or represents a conflict with the business of the Company as determined in the reasonable discretion of the Board.

3. COMPENSATION. Executive's compensation shall be paid as follows:

a. Base Salary. Executive shall receive as compensation a base salary at an annual rate of Three Hundred Forty Thousand Dollars ($340,000.00 ("Base Salary"), less any federal, state and local payroll taxes and other withholdings legally required or properly requested by Executive. Base Salary shall be payable semi-monthly in accordance with the Company's regular payroll practices and procedures. Base Salary for the period commencing January 1, 2023 and each year thereafter shall be subject to annual review by the Company and adjustment within the Company's discretion. Notwithstanding the forgoing provisions, Executive's Base Salary shall be subject to a special review by the Company immediately following the first United States Food and Drug Administration ("FDA") regulatory approval during the Term of a Company New Drug Application for the drug referred to as SB206 (the "NDA-SB206") and, upon such review, the Company may adjust Executive's Base Salary, but it may not at such time reduce it below the amount of Base Salary set forth above.

b. Annual Bonus. For each calendar year during the Term, Executive will be eligible to receive an annual performance-based cash bonus, upon achievement of the annual bonus objectives established by the Company ("Annual Bonus") pursuant to the Company's bonus program as may established by the Company from time to time, with a target Annual Bonus equal to thirty five percent (35%) of Base Salary paid in a calendar year for achievement of the performance objectives established by the Company; provided, however, that immediately following the Company's commercial launch of the drug covered by the NDA-SB206 referred to in Section 3(a), and subject to achievement of sale targets to be agreed upon by the CEO, the target for Executive's Annual Bonus shall be increased to fifty percent (50%) of Base Salary paid in the applicable calendar year. In the event Executive's target changes during a calendar year as the result of the commercial launch of the drug covered by NDA-SB206, the Annual Bonus for such year will be prorated between the applicable targets with each target applied to the portion of the Annual Bonus amount that reflects the period of time covered by each target. Executive's eligibility for any Annual Bonus is contingent on Executive remaining employed through December 31 of the applicable calendar year, except as otherwise provided in Section 6. Each Annual Bonus will be paid to Executive no later than March 15 of the calendar year following the calendar year during which performance is measured.

c. Equity Grant. Conditioned on approval by the Company's Board of Directors, the Company will grant to Executive 50,000 nonqualified stock options to purchase shares of the Company's Common Stock, with an exercise price to be determined in accordance with the terms of the Company's 2016 Incentive Award Plan, as amended or restated from time to time (collectively, the "2016 Plan"), which options will vest in three (3) equal annual installments on each annual anniversary of the grant until fully vested, subject to Executive's continuous service with the Company on each such vesting date. Such options will be subject to the terms of the 2016 Plan and the standard stock option award agreement.

d. Equity Incentive Plan. Executive will be eligible to participate in Company's incentive award plans as may be approved by the Board from time-to-time, including the 2016 Plan, at such level and on such terms as shall be approved by the Compensation Committee of the Board, in its sole discretion.

e. Paid Time Off. Executive is entitled to receive the maximum amount of paid-time-off ("PTO") allowed under the Company's policies, which PTO will be accrued and used in accordance with the Company's policies.

f. Benefits. Executive shall be entitled to participate in employee benefit plans, programs and arrangements of the Company as are provided generally from time to time to all other similarly situated employees of the Company. All such benefits are subject to the provisions of their respective plan documents in accordance with their terms and are subject to amendment or termination by the Company without Executive's consent.

g. Business Expenses. The Company will reimburse all reasonable expenses incurred by Executive in the performance of his duties to the Company, provided Executive complies with the Company's policies and procedures for reimbursement or advance of business expenses established by the Company.

4. EMPLOYMENT AT WILL; TERMINATION. The term of employment under this Agreement (the "Term") shall commence on the Effective Date and continue until termination as provided in this Section 4, and subject to the terms of Section 6. Subject to Section 6, Executive's employment with the Company is atwill, and either party can terminate the employment relationship and/or this Agreement at any time, for any or no cause or reason, and with or without prior notice.

5. EFFECT OF TERMINATION. Upon termination of Executive's employment hereunder by either party regardless of the cause or reason, the Company shall pay Executive accrued, unpaid wages through the termination date and reimbursement for unreimbursed business expenses properly incurred by Executive, which shall be subject to and paid in accordance with the Company's expense reimbursement policy (the "Accrued Amounts"). The final payment of wages, less any withholdings required by law or properly requested by Executive, shall be made on the next regular payday of the Company following the termination, in accordance with the Company's normal payroll procedures. Except as otherwise provided in Section 6 of this Agreement, no other payments, benefits or other remuneration shall be due or payable to Executive.

6. SEVERANCE PROVISIONS.

(a) Definitions. For the purposes of this Agreement, the following terms shall be defined as set out below:

i. "Cause" shall be determined in good faith by the Board (excluding Executive if then a director) and shall mean:

a. Executive's conviction of, or plea of no contest to, any crime (whether or not involving the Company) that constitutes a felony in the jurisdiction in which Executive is charged, or that involves moral turpitude;

b. Any act of theft, fraud or embezzlement, or any other willful misconduct or materially dishonest behavior by Executive involving or in connection with Executive's position with the Company;

c. Executive's failure to adequately perform his reasonably assigned duties, provided that such failure or refusal is not corrected as promptly as practicable, and in any event within sixty (60) calendar days after Executive shall have received written notice from the Company stating the nature of such failure or refusal;

d. Executive's willful or material violation of any of his obligations contained in any agreement between Executive and the Company, including but not limited to the Confidentiality and Assignment of Inventions Agreement and Noncompetition Agreement executed by Executive;

e. Conduct by Executive that constitutes willful gross neglect or willful gross misconduct in carrying out his duties under this Agreement that results or that may result, as reasonably determined by the Company, in material harm to the Company, including harm to its reputation; and/or

f. Any material failure by Executive to comply with the Company's written policies or rules, as they may be in effect from time to time, i such failure causes material/reputational or financial harm to the Company.

ii. "Change in Control" shall have the same meaning given to such term in Section 2.9 of the Company's 2016 Plan. The Board shall have sole discretion to determine conclusively whether a Change in Control has occurred pursuant to the above definition, the date of the occurrence of such Change in Control and all incidental matters relating thereto; provided that any exercise of authority in conjunction with a determination of whether a Change in Control is a "change in control event" as defined in Treasury Regulation Section 1.409A-3(i)(5) shall be consistent with such regulation.

iii. "Disability" shall mean Executive's inability due to a physical or mental impairment to perform the essential functions of his job, with or without reasonable accommodation, for a period of at least ninety (90) consecutive or non-consecutive days in any twelve-month period.

iv. "Effective Release" is defined as a general release of claims in favor of the Company in a form reasonably acceptable to the Company's counsel that is executed after the Separation Date and within any consideration period required by applicable law and that is not revoked by Executive within any legallyprescribed revocation period. Failure to provide and have in effect an Effective Release within the sixty (60) day period following the Separation Date shall result in forfeiture of any benefits conditioned upon the existence of an Effective Release.

v. "Good Reason" shall mean the occurrence of any of the following, in each case during the Term without Executive's consent:

a. a material diminution in Executive's Base Salary or Annual Bonus eligibility (other than in both cases a diminution that is in connection with an across the board reduction in the base salaries or bonus eligibility of the management level employees of the Company);

b. a material, adverse change in Executive's title, authority, duties, or responsibilities (other than temporarily while Executive is physically or mentally incapacitated or as required by applicable law), taking into account the Company's size, status as a public company, and capitalization as of the date of this Agreement; provided, however, that Good Reason shall not exist based on Executive's appointment to similar positions of a subsidiary or affiliate of the Company;

c. a material change in the geographic location at which Executive must perform services for the Company, not to include regular business travel; or

d. any other action or inaction that constitutes a material breach of the terms of this Agreement by the Company.

Notwithstanding the forgoing, Good Reason shall not include an event or condition unless (A) Executive notifies the Company within thirty (30) days of the initial existence of one of the adverse events described above, (B) Executive provides the Company with at least thirty (30) days' written notice of his intent to resign for Good Reason, and (C) the Company fails to correct the adverse event within thirty (30) days of such notice.

vi. "Separation Date" shall mean the date that Executive's employment is terminated.

(b) Compensation upon Separation without Cause or for Good Reason Not in Connection with a Change in Control. Upon termination of employment by the Company without Cause or upon termination of employment by Executive for Good Reason, in each case, only if Executive is not entitled to benefits under Section 6(c) of this Agreement, conditioned upon the existence of an Effective Release and Executive's continued compliance with the Restrictive Covenants Agreements and the terms thereunder, and subject to Section 7(c) and Section 8, Executive shall be entitled to, in lieu of any other separation payment or severance benefit available under any plan or otherwise:

i. Payment of severance pay in an amount equal to (i) twelve (12) months of Executive's current Base Salary, plus (ii) a prorated Annual Bonus calculated at the minimum target level for the calendar year in which the Separation Date occurs based on the percentage of the calendar year actually worked by Executive as of the Separation Date (both (i) and (ii) referred to herein collectively as "Regular Severance Pay"). All applicable withholdings required by law or authorized by Executive shall be withheld from Severance Pay. Severance Pay shall be paid in equal installments paid over the 12-month period (the "Regular Severance Period") following Executive's Separation Date pursuant to the Company's standard payroll practices and procedures applicable to Executive immediately prior to Executive's separation from service and such payments shall commence on the first such payroll date on or following the 10th day after the date on which the Effective Release becomes effective and non-revocable, as provided in Section 6(a)(iv); provided, however, that if the 60th day following Executive's termination from employment occurs in the year following the year of Executive's termination, then the payments shall commence no earlier than January 1 of such subsequent year, and the first

such installment payment may include any payments missed due to any delay under this Section 6(b)(i);

ii. Payment of the amount of any unpaid Annual Bonus for the prior calendar year, if any, to be paid when Annual Bonuses are paid to other executives at Executive's level or on the same date as the first installment of Regular Severance Pay is made, whichever date is later;

iii. Vesting as of the Separation Date of any then unvested equity awards that would have otherwise vested through the end of the calendar year in which the Separation Date occurs; and

iv. If Executive timely and properly elects health continuation coverage under the Consolidated Omnibus Budget Reconciliation Act of 198 ("COBRA"), the Company shall reimburse Executive during the Regular Severance Period for the difference between the monthly COBR premium paid by Executive for himself and his dependents and the monthly premium amount paid by similarly situated active executives. Such reimbursement shall be paid to Executive on the 10th business day of the month immediately following the month in which the Executive timely remits the premium payment. Executive shall be eligible to receive such reimbursement until the earliest of: (a) the six-month anniversary of the Separation Date; (b) the date Executive is no longer eligible to receive COBRA continuation coverage; or (c) the date on which Executiv becomes eligible to receives substantially similar coverage from another employer or other source. Notwithstanding the foregoing, if the Company's reimbursements under this Section 6(b)(iv) would violate the nondiscrimination rules applicable to non-grandfathered plans under the Affordable Care Act (the "ACA"), or result in the imposition of penalties under the ACA and the related regulations and guidance promulgated thereunder), the parties agree to reform this Section 6(b)(iv) in a manner as is necessary to comply with the ACA.

(c) Compensation upon Separation due to Change in Control. Upon termination of employment by the Company without Cause or upon termination of employment by Executive for Good Reason at the time of, or within twelve (12) months after a Change in Control, and conditioned upon the existence of an Effective Release and Executive's continued compliance with the Restrictive Covenants Agreements and the terms thereunder, and subject to Section 7(c) and Section 8, Executive shall be entitled to, in lieu of any other separation payment or severance benefit available under any plan or otherwise (including but not limited to the severance benefits provided for in Section 6(b) hereof):

i. Payment of severance pay in an amount equal to (i) twelve (12) months of Executive's current Base Salary, plus (ii) an amount equal to the Annual Bonus calculated at the minimum target level for the calendar year in which the Separation Date occurs (both (i) and (ii) referred to herein collectively as "CIC Severance Pay"). All applicable withholdings required by law or authorized by Executive shall be withheld from Severance Pay. Severance Pay shall be paid in equal installments paid over the twelve-month period (the "CIC Severance Period") following Executive's Separation Date pursuant to the Company's standard payroll practices and procedures applicable to Executive immediately prior to Executive's separation from service and such payments shall commence on the first such payroll date on or following the 10th day after the date on which the Effective Release becomes effective and non-revocable, as provided in

Section 6(a)(iv); provided, however, that if the 60th day following Executive's termination from employment occurs in the year following the year of Executive's termination, then the payments shall commence no earlier than January 1 of such subsequent year, and the first such installment payment may include any payments missed due to any delay under this Section 6(c)(i);

ii. Payment of the amount of any unpaid Annual Bonus for the prior calendar year, if any, to be paid when Annual Bonuses are paid to other executives at Executive's level or on the same date as the first installment of CIC Severance Pay is made, whichever date is later;

iii. Accelerated vesting of the remaining unvested portion of any and all equity awards issued to Executive as of the Separation Date;

iv. If Executive timely and properly elects health continuation coverage under COBRA, the Company shall reimburse Executive during the CI Severance Period for the difference between the monthly COBRA premium paid by Executive for himself and his dependents and the monthl premium amount paid by similarly situated active executives. Such reimbursement shall be paid to Executive on the 10th business day of the month immediately following the month in which the Executive timely remits the premium payment. Executive shall be eligible to receive such reimbursement until the earliest of: (a) the twelfth-month anniversary of the Separation Date; (b) the date Executive is no longer eligible to receive COBRA continuation coverage; or (c) the date on which Executive becomes eligible to receives substantially similar coverage from another employer or other source. Notwithstanding the foregoing, if the Company's reimbursements under this Section 6(c)(iv) would violate the nondiscrimination rules applicable to non-grandfathered plans under the ACA, or result in the imposition of penalties under the ACA and the related regulations and guidance promulgated thereunder), the parties agree to reform this Section 6(c)(iv) in a manner as is necessary to comply with the ACA.

(d) Compensation Upon Voluntary Retirement. If on or after the date Executive turns sixty (60) years of age, Executive voluntarily resigns his employment after providing the Company with at least sixty (60) days' written notice, and conditioned upon the existence of an Effective Release and Executive's continued compliance with the Restrictive Covenants Agreements and the terms thereunder, and subject to Section 7(c) and Section 8, then Executive shall be entitled to:

i. Payment of an amount equal to Executive's Base Salary for a one-year period, with the amount of Base Salary for these purposes only to be calculated based on the highest rate of Base Salary Executive has received during the term of this Agreement, less all applicable withholdings ("Retirement Pay"). Retirement Pay shall be paid in equal installments over the 12-month period following Executive's Separation Date pursuant to the Company's standard payroll practices and procedures applicable to Executive immediately prior to Executive's separation from service, and, unless a delay is required under Section 7(d), such payments shall commence on the first such payroll date on or following the 10th day after the date on which the Effective Release becomes effective and non-revocable, as provided in Section 6(a)(iv); provided, however, that if the 60th day following Executive's termination from employment occurs in the year following the year of Executive's termination, then the payments shall commence no earlier than January 1 of such subsequent year, and the first such installment payment may include any payments missed due to any delay under this Section 6(d);

ii. Payment of the amount of any unpaid Annual Bonus under Section 3(b) for the prior calendar year, if any, to be paid when Annual Bonuses are paid to other executives at Executive's level or on the same date as the first installment of Retirement Pay is made, whichever date is later;

iii. Payment of a prorated Annual Bonus under Section 3(b) for the calendar year in which the Separation Date occurs based on the percentage of the calendar year actually worked by Executive prior to the Separation Date, with the amount of such Annual Bonus, if any, to be determined by the Company in its discretion after the end of such calendar year applying the applicable performance objectives under Section 3(b) to the full calendar year. Such Annual Bonus, if any, shall be paid in accordance with the schedule set forth in Section 3(b) of this Agreement; and

iv. Vesting as of the Separation Date of any then unvested equity awards that would have otherwise vested through the end of the calendar year in which the Separation Date occurs.

(e) Other Termination of Employment. Upon the termination of Executive's employment by Executive, other than for Good Reason, or due to Executive's death or Disability, or by the Company for Cause, Executive shall not be entitled to additional compensation under this Agreement beyond the Accrued Amounts and unpaid Annual Bonus for the prior calendar year, if any. For clarity and the avoidance of doubt, under no circumstances will Executive be entitled to benefits under both Section 6(b) and Section 6(c) or under Section 6(b) or Section 6(c) and Section 6(d).

7. SECTION 409A.

a. Intent of the Parties. The parties hereby acknowledge and agree that all benefits or payments provided by the Company to Executive pursuant to this Agreement are intended either to be exempt from Section 409A of the Internal Revenue Code of 1986, as amended (the "Code"), or to be in compliance with Section 409A, and this Agreement shall be interpreted to the greatest extent possible to be so exempt or in compliance and to incorporate the terms and conditions required by Section 409A. If there is an ambiguity in the language of this Agreement, or if Section 409A guidance indicates that a change to this Agreement is required or desirable to achieve exemption or compliance with Section 409A, notwithstanding any provision of this Agreement to the contrary, the Company reserves the right (without any obligation to do so or to indemnify Executive for failure to do so) to (i) adopt such amendments to this Agreement and or adopt such other policies and procedures, including amendments, policies and procedures with retroactive effect, that the Company determines to be necessary or appropriate to preserve the intended tax treatment of the benefits provided by this Agreement, to preserve the economic benefits of this Agreement and to avoid less favorable accounting or tax consequences for the Company and/or (ii) take such other actions as the Company determines to be necessary or appropriate to exempt the amounts payable hereunder from Section 409A or to comply with the requirements of Section 409A and thereby avoid the application of penalty taxes thereunder. No provision of this Agreement shall be interpreted or construed to transfer any liability for failure to comply with the requirements of Section 409A from Executive or any other individual to the Company or any of its affiliates, employees or agents.

b. Installments. If any severance or other payments that are required by this Agreement are to be paid in a series of installment payments, each individual payment in the series shall be considered a separate payment for purposes of Section 409A. To the extent that any reimbursement of expenses or inkind benefits constitutes "deferred compensation" under Section 409A, such reimbursement or benefit shall be provided no later than December 31 of the year following the year in which the expense was incurred. The amount of expenses reimbursed in one year shall not affect the amount eligible for reimbursement in any subsequent year. The amount of any inkind benefits provided in one year shall not affect the amount of inkind benefits provided in any other year.

c. Delay. If any severance compensation or other benefit provided to Executive pursuant to this Agreement that constitutes "nonqualified deferred compensation" within the meaning of Section 409A is considered to be paid on account of "separation from service" within the meaning of Section 409A, and Executive is a "specified employee" within the meaning of Section 409A, no payments of any such severance or other benefit shall be made for six (6) months plus one (1) day after the Separation Date (the "New Payment Date"). Amounts payable under this Agreement shall be deemed not to be "nonqualified deferral of compensation" subject to Section 409A to the extent provided in the exceptions in Treasury Regulation § § 1.409A1(b)(4) ("short-term deferrals") and (b)(9) ("separation pay plans," including the exception under subparagraph (iii)) and other applicable provisions of Section 409A. The aggregate of any such payments that would have otherwise been paid during the period between the Separation Date and the New Payment Date shall be paid to Executive in a lump sum on the New Payment Date.

8. EXCESS PARACHUTE PAYMENTS. In the event amounts payable under this Agreement or otherwise are contingent on a change in control for purposes of Section 280G of the Code, and it is determined by a public accounting firm or legal counsel authorized to practice before the Internal Revenue Service selected by the Company that any payment or benefit made or provided to Executive in connection with this Agreement or otherwise ("Payment" or collectively, the "Payments") would be subject to the excise tax imposed by Section 4999 of the Code (the "Parachute Tax"), the Payments under this Agreement shall be payable in full or, if applicable, in such lesser amount which would result in no portion of such Payments being subject to the Parachute Tax, whichever of the foregoing amounts, taking into account the applicable federal, state and local income taxes and the Parachute Tax, results in Executive's receipt, on an after-tax basis, of the greatest amount of Payments under this Agreement. If Payments are reduced pursuant to this paragraph, cash severance payments under Sections 6(b)(i), 6(b)(ii) and 6(b)(iv), Sections 6(c)(i),6(c)(ii) and 6(c)(iv) or Section 6(d)(i), 6(d)(ii) and 6(d)(iii), as applicable, shall first be reduced, and the other benefits under this Agreement shall thereafter be reduced, to the extent necessary so that no portion of the Payments is subject to the Parachute Tax.

9. NOTICES. Any notice required or permitted hereunder shall be made in writing (a) either by actual delivery of the notice into the hands of the party thereto entitled, by messenger, by fax or by over-night delivery service or (b) by the mailing of the notice in the United States mail, certified or registered mail, return receipt requested, all postage pre-paid and addressed to the party to whom the notice is to be given at the party's respective address set forth below, or such other address as the parties may from time to time designate by written notice as herein provided.

If to Executive: Brian Johnson
[***]
[***]

If to the Company: Novan, Inc.
4020 Stirrup Creek Drive, Suite 110
Durham, NC 27703
(Fax) (919) 237−9212
Attn: President and Chief Executive Officer

The notice shall be deemed to be received, if sent per subsection (a), on the date of its actual receipt by the party entitled thereto and, if sent per subsection (b), on the third day after the date of its mailing.

10. RETURN OF COMPANY PROPERTY. Upon Executive's separation from employment from the Company for any reason, Executive shall return to the Company all personal property belonging to the Company ("Company Property") that is in Executive's possession or control as of the Separation Date, including, without limitation, all records, papers, drawings, notebooks, specifications, marketing materials, software, reports, proposals, equipment, or any other device, document or possession, however obtained, whether or not such Company Property contains confidential information belonging to the Company. Such Company Property shall be returned in the same condition as when provided to Executive, reasonable wear and tear excepted.

11. EMPLOYEE REPRESENTATIONS.

a. Executive represents that his performance of all of the terms of this Agreement does not and will not breach any arrangement to keep in confidence information acquired by Executive in confidence or in trust prior to Executive's employment by the Company. Executive represents that he has not entered into, and agrees not to enter into, any agreement either oral or written in conflict herewith.

b. Executive understands as part of the consideration for this Agreement and for Executive's employment or continued employment by the Company, that Executive has not brought and will not bring with Executive to the Company, or use in the performance of Executive's duties and responsibilities for the Company or otherwise on its behalf, any materials or documents of a former employer or other owner which are generally not available to the public, unless Executive has obtained written authorization from the former employer or other owner for their possession and use and has provided the Company with a copy thereof.

c. Executive understands that during his employment for the Company he is not to breach any obligation of confidentiality that Executive has to a former employer or any other person or entity and agrees to comply with such understanding.

12. INDEMNIFICATION.

a. By Executive. Executive agrees to indemnify and hold harmless the Company, its directors, officers, agents and employees against any liabilities and expenses, including amounts paid in settlement, incurred by any of them in connection with any claim by any of Executive's prior employers that the termination of Executive's employment with such

employer, Executive's employment by the Company, or use of any skills and knowledge by the Company is a violation of contract or law or otherwise violates the rights thereof.

b. By the Company. The Company will indemnify and hold harmless the Executive from any liabilities and expenses arising from Executive's actions as an officer, director or employee of the Company to the fullest extent permitted by law, excepting any unauthorized acts, intentional or illegal conduct which breaches the terms of this or any other agreement or Company policy, including but not limited to the Restrictive Covenants Agreements. Executive will be covered by the Company's D&O insurance to the same extent as other executive officers and directors. The indemnification described in this Section 12 is in addition to, and not in lieu of, any right to indemnification provided by the Company to Executive pursuant to any separate written agreement between them, including but not limited to the Indemnification Agreement between the Company and Executive dated as of January 28, 2019 (the "Indemnification Agreement").

13. SEVERABILITY. Executive hereby agrees that each provision herein shall be treated as a separate and independent clause, and the unenforceability of any one clause shall in no way impair the enforceability of any of the other clauses herein.

14. WAIVER. Any waiver by the Company of a breach of any provision of this Agreement shall not operate or be construed as a waiver of any subsequent breach of such provision or any other provision hereof.

15. AFFILIATES; ASSIGNMENT; BINDING EFFECT. The term "Company" shall also include any of the Company's subsidiaries, subdivisions or affiliates. The Company shall have the right to assign this Agreement to its successors and assigns, and all covenants and agreements hereunder shall inure to the benefit of and be enforceable by said successors or assigns. Executive may not assign any of his rights or delegate any of his duties under this Agreement. This Agreement shall be binding upon and shall inure to the benefit of each of the parties hereto, and to their respective heirs, representatives, successors and permitted assigns.

16. ENTIRE AGREEMENT. The terms of this Agreement (together with any other agreements and instruments contemplated hereby or referred to herein) are intended by the parties hereto to be the final expression of their agreement with respect to the employment of Executive by the Company and may not be contradicted by evidence of any prior or contemporaneous agreement (including, without limitation, any prior or contemporaneous employment agreement, term sheet or offer letter). The parties hereto further intend that this Agreement shall constitute the complete and exclusive statement of its terms and that no extrinsic evidence whatsoever may be introduced in any judicial, administrative or other legal proceeding to vary the terms of this Agreement. No modification of or amendment to this Agreement, nor any waiver of any rights under this Agreement, will be effective unless in writing and signed by each of the parties hereto.

17. GOVERNING LAW; VENUE. This Agreement shall be construed, interpreted, and governed in accordance with and by North Carolina law and the applicable provisions of federal law ("Applicable Federal Law"). Any and all claims, controversies, and causes of action arising out of or relating to this Agreement, whether sounding in contract, tort, or statute, shall be governed by the laws of the state of North Carolina, including its statutes of limitations, except for Applicable Federal Law, without giving effect to any North Carolina conflict-of-laws rule that would result in the application of the laws of a different jurisdiction. Both Executive and the

Company acknowledge and agree that the state or federal courts located in North Carolina have personal jurisdiction over them and over any dispute arising under this Agreement, and both Executive and the Company irrevocably consent to the jurisdiction of such courts.

18. COUNTERPARTS. This Agreement may be executed in separate counterparts, each of which is deemed to be an original and all of which taken together constitute one agreement. Counterparts may be transmitted and/or signed by facsimile or electronic mail. The effectiveness of any such documents and signatures shall have the same force and effect as manually signed originals and shall be binding on the parties to the same extent as a manually signed original thereof.

[Signature Page Follows]

IN WITNESS WHEREOF, the parties have executed this Employment Agreement effective as of the day and year first above written.

NOVAN, INC.

/s/ Paula Brown Stafford

Paula Brown Stafford
Chairman, President and Chief Executive Officer

Brian M. Johnson

/s/ Brian M. Johnson

Exhibit 10.19

Certain confidential information contained in this exhibit have been omitted by means of redacting a portion of the text and replacing it with [***], pursuant to Regulation S-K Item 601(b) of the Securities Act of 1933, as amended. Certain confidential information has been excluded from this exhibit because it is: (i) not material; and (ii) the registrant treats such information as private or confidential.

FOURTH AMENDMENT TO AMENDED, RESTATED, AND CONSOLIDATED LICENSE AGREEMENT

This Fourth Amendment (the **"Fourth Amendment")** to the Amended, Restated and Consolidated License Agreement dated June 27th, 2012 between The University of North Carolina at Chapel Hill **("University")** and Novan, Inc. **("Licensee"),** as amended by the First Amendment to Amended, Restated and Consolidated License Agreement dated November 30th, 2012 and further amended by the Second Amendment to Amended, Restated and Consolidated License Agreement dated April 12th, 2016 and further amended by the Third Amendment to Amended, Restated and Consolidated License Agreement dated November 1, 2018 (hereinafter referred to as the **"Agreement")** is entered into as of November 26, 2018 (the "Fourth Amendment Effective Date").

WHEREAS, the parties now wish to amend the Agreement in recognition to clarify procedures in the event of Licensee bankruptcy;

WHEREAS, the parties agree to be bound by the terms and conditions of the Agreement, as amended;

NOW THEREFORE, the parties agree as follows:

1. Section 7.3 is deleted in the entirety and replaced with the following:

"If LICENSEE becomes bankrupt, files a petition for or is the subject of a petition for bankruptcy, or is place in the hands of a receiver, assignee, or trustee for the benefit of creditors, whether by the voluntary act of LICENSEE or otherwise, then this LICENSE AGREEMENT may be terminated by UNIVERSITY upon written notice to LICENSEE within [***] of the occurrence of such events."

2. Capitalized terms used herein have the same meaning as was given them in the Agreement.

3. Facsimile signatures and signatures transmitted via pdf shall be treated as original signatures.

4. Other than as amended herein, the Agreement remains in full force and effect.

IN WITNESS WHEREOF, the parties have executed this amendment to the Agreement, as indicated below.

THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

BY: /s/ Jacqueline Quay
Jacqueline Quay
Director of Licensing and
Innovation Support, OTC
DATE: 11/27/2018

LICENSEE

BY: /s/ G. Kelly Martin
NAME: G. Kelly Martin
TITLE: Chief Executive Officer

DATE: 11/26/2018

Exhibit 10.20

Certain confidential information contained in this exhibit have been omitted by means of redacting a portion of the text and replacing it with [***], pursuant to Regulation S-K Item 601(b) of the Securities Act of 1933, as amended. Certain confidential information has been excluded from this exhibit because it is: (i) not material; and (ii) the registrant treats such information as private or confidential.

**FIFTH AMENDMENT TO AMENDED, RESTATED,
AND CONSOLIDATED LICENSE AGREEMENT**

This Fifth Amendment (the "**Fifth Amendment**") to the Amended, Restated and Consolidated License Agreement dated June 27th, 2012 between The University of North Carolina at Chapel Hill ("**University**") and Novan, Inc. ("**Licensee**"), as amended by the First Amendment to the Amended, Restated and Consolidated License Agreement dated November 30th, 2012, and amended by the Second Amendment to the Amended, Restated and Consolidated License Agreement dated April 12th, 2016, and amended by the Third Amendment to the Amended, Restated and Consolidated License Agreement dated November 1, 2018, and further amended by the Fourth Amendment to the Amended, Restated and Consolidated License Agreement dated November 26, 2018 (hereinafter referred to collectively as the "**Agreement**") is entered into as of October 27, 2021 (the "**Fifth Amendment Effective Date**").

WHEREAS, the parties now wish to amend the Agreement to [***] in Appendix D of the Agreement; and

WHEREAS, the parties agree to be bound by the terms and conditions of the Agreement, as amended.

NOW, THEREFORE, the parties agree as follows:

1. Appendix D of the Agreement is hereby deleted in its entirety and replaced with the attached Appendix D.

2. In consideration for [***], Licensee shall pay University [***] within [***] days of the Fifth Amendment Effective Date. Such fee shall not be creditable against any future payments or royalties, provided that [***], such [***] fee shall be fully creditable against any payments owed by Licensee to University under Section 3.8 of the Agreement.

3. Capitalized terms used herein have the same meaning as was given them in the Agreement.

4. This Fifth Amendment may be executed by one or more of the parties to this Fifth Amendment on any number of separate counterparts, and all of said counterparts taken together shall be deemed to constitute one and the same instrument. Facsimile signatures and signatures transmitted via pdf shall be treated as original signatures.

5. Other than as amended herein, the Agreement remains in full force and effect.

[signature page follows]

IN WITNESS WHEREOF, the parties have executed this Fifth Amendment to the Agreement, as indicated below.

THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

BY: /s/ Jacqueline Quay
Jacqueline Quay
Director of Licensing and
Innovation Support, OTC
DATE: 11/11/2021

NOVAN, INC.

BY: /s/ Paula Brown Stafford
Paula Brown Stafford
President & CEO

DATE: 11/9/2021

APPENDIX D
MILESTONES

[***]

Exhibit 10.30

Certain confidential information contained in this exhibit have been omitted by means of redacting a portion of the text and replacing it with [***], pursuant to Regulation S-K Item 601(b) of the Securities Act of 1933, as amended. Certain confidential information has been excluded from this exhibit because it is: (i) not material; and (ii) the registrant treats such information as private or confidential.

Execution Version
Confidential

ROYALTY AND MILESTONE PAYMENTS PURCHASE AGREEMENT

This Royalty and Milestone Payments Purchase Agreement (this "**Agreement**") is entered into as of April 29, 2019 (the "**Effective Date**") by and between Novan, Inc., a Delaware corporation ("**Novan**"), and Reedy Creek Investments LLC, a North Carolina limited liability company (**Reedy Creek**"). Novan and Reedy Creek are also referred to individually as a "**Party**" and together as the "**Parties**".

BACKGROUND

WHEREAS, Novan is in the business of developing and commercializing pharmaceutical products for, among other things, the treatment of dermatological conditions and other indications in humans and wishes to obtain funding in respect of such development and commercialization efforts;

WHEREAS, Novan wishes to sell, assign, convey and transfer to Reedy Creek the Assigned Rights (as defined below) in consideration for the payment by Reedy Creek of the Purchase Price (as defined below); and

WHEREAS, Reedy Creek wishes to purchase from Novan the Assigned Rights, all on the terms and conditions set forth below.

NOW, THEREFORE, in consideration of the premises and mutual covenants herein below, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

1. DEFINITIONS

The following capitalized terms shall have the meanings set forth below when used in this Agreement.

"**Affiliate**" means with respect to each Party, any Person that directly or indirectly is controlled by, controls or is under common control with a Party. For the purposes of this definition only, the term "control" (including, with correlative meanings, the terms "controlled

by" and "under common control with") as used with respect to a Person means (a) in the case of a corporate entity, direct or indirect ownership of voting securities entitled to cast at least fifty percent (50%) of the votes in the election of directors or (b) in the case of a non-corporate entity, direct or indirect ownership of at least fifty percent (50%) of the equity interests with the power to direct the management and policies of such entity; provided that, if local laws restrict foreign ownership, control shall be established by direct or indirect ownership of the maximum ownership percentage that may, under such local laws, be owned by foreign interests, but only if such lower percentage provides such Person with the power to direct the management and policies of such entity.

"**Akron License Agreement**" means that certain License Agreement between Novan and The University of Akron Research Foundation with a effective date of May 23, 2012, as may be amended from time to time.

"**Applicable Laws**" means all applicable laws, statutes, rules, regulations, ordinances and other pronouncements having the effect of law of any federal, national, multinational, state, provincial, county, city or other political subdivision, domestic or foreign, that relate to a Party's activities under this Agreement, including any rules, regulations, guidelines or other requirements of any applicable Regulatory Authority.

"**Assigned Rights**" means the SB204 Rights, SB206 Rights and SB414 Rights.

"**Assigned Rights Period**" means, with respect to each Product, the longer of: (a) the period beginning with the Effective Date and ending on the [***] of the Effective Date and (b) the period beginning with the Effective Date and ending on the [***] of the First Commercial Sale of such Product.

"**Calendar Quarter**" means each three (3)-month period commencing on January 1, April 1, July 1 or October 1.

"**Calendar Year**" means each twelve (12)-month period commencing on January 1 and ending on December 31.

"**Change of Control**" means, with respect to a Party, the occurrence of any of the following: (a) any "person" or "group" (as such terms are defined in Section 13(d) and Section 14(d) of the Securities Exchange Act of 1934, as amended, or any successor provisions (the "**Exchange Act**")) that is or becomes the "beneficial owner" (as determined in accordance with Rule 13d-3 under the Exchange Act), directly or indirectly, of shares of voting stock (or other equity interest) of such Party representing fifty percent (50%) or more of the total voting power of all outstanding classes of voting stock (or other equity interest) of such Party; (b) the sale or transfer of all or substantially all of the assets of such Party; or (c) any merger, consolidation, share exchange, business combination or similar transaction in which such Party is not the surviving entity or in which the holders of the outstanding shares of stock of such Party immediately prior to such transaction hold, immediately after such transaction, less than fifty

percent (50%) of the total voting power of the outstanding securities entitled to vote generally in the election of directors of the surviving or resulting entity in such transaction.

"**Clinical Trial Success**" means (i) the achievement, no later than March 31, 2020, of statistically significant rates of complete clearance of lesions for molluscum contagiosum in humans at week 12 in each of the two Phase III Clinical Trials or any other primary endpoint required or accepted by the FDA fo the SB206 Product, or (ii) equivalent achievement (as agreed upon by the Parties).

"**Commercialize**" or "**Commercialization**" means, with respect to a Product, marketing, promotion, sale (and offer for sale or contract to sell), distribution, importation or other commercial exploitation of such Product following receipt Regulatory Approval. Commercialization shall include commercial activities conducted in preparation for First Commercial Sale.

"**Commercially Reasonable Efforts**" means, with respect to Novan's obligation under this Agreement to develop, obtain Regulatory Approval or Commercialize a Product, the level of effort, expertise, and resources required to carry out such obligation that would be typically exerted by a similarly situated biotechnology or pharmaceutical company of comparable size and capabilities as Novan in pursuing the development and commercialization of a similar product with similar product characteristics at a similar stage in its development or product life, including without limitation with respect to commercial potential, the proprietary position of such Product, the regulatory status and approval process and other relevant technical, scientific, medical or legal factors.

"**Confidential Information**" of a Party means (a) the terms and conditions of this Agreement; and (b) any information or material, including all trade secrets, whether in tangible form or not, disclosed by such Party to the other Party prior to the Effective Date or during the Term; provided, however, that the foregoing information in subsection (b) shall not be deemed Confidential Information, to the extent the receiving Party can establish by competent proof that such information:

(i) was already known to the receiving Party, other than under an obligation of confidentiality owed to the disclosing Party, at the time of disclosure;

(ii) was generally available to the public or otherwise part of the public domain at the time of its disclosure hereunder to the receiving Party;

(iii) becomes generally available to the public or otherwise part of the public domain after its disclosure and other than through any act or omission of the receiving Party in breach of this Agreement;

(iv) was independently developed by the receiving Party without use of or reference to any Confidential Information disclosed by the disclosing Party or

(v) was subsequently disclosed to the receiving Party by a person other than the disclosing Party that was not under any legal obligation to the disclosing Party with respect to such information.

"**Contract Party**" means, as applicable, a Licensee, or any Third Party with which Novan or its Affiliates engages for the development Commercialization, marketing, Regulatory Approval, or sale of a Product.

"**Development Payments**" means any payments received by Novan from Third Parties, including Licensees, as consideration for Novan's or its Affiliates' performance of research and development services or activities or the provision of goods or materials regarding the Products or otherwise, including without limitation any related reimbursement or cost-sharing arrangements or activities. Development Payments shall not include any payments received by Novan in connection with Commercialization.

"**FDA**" means the United States Food and Drug Administration or any successor agency thereto.

"**First Commercial Sale**" means for each Product, the first commercial sale to a Third Party in any country in the Territory as part of a nationwide introduction by Novan or its sublicensees following receipt of Regulatory Approval. Sales for clinical trial purposes or for compassionate use or on a named patient basis shall not be considered to constitute a First Commercial Sale.

"**In-License Agreement**" means, with respect to each Product, (a) the following license agreements or other written agreements entered into by Novan and a Third Party whereby Novan is granted rights under Intellectual Property of such Third Party with respect to such Product: the UNC Licen Agreement, Akron License Agreement and KIPAX Agreement; and (b) any such license agreement or written agreement entered into by Novan and a Thir Party and approved by Reedy Creek under Section 3.7.

"**Included Payments**" means, as applicable, the aggregate payments due or payable to Reedy Creek hereunder for Assigned Rights and Sales Royalties.

"**Intellectual Property**" means any and all right, title and interest in, arising from, or relating to inventions, ideas, Know-How, works of authorship and confidential information, including copyrights, patents and patent applications, trade secrets, any registrations or applications relating to any of the foregoing, and any other rights of a similar nature or character whether now existing or hereafter created, developed, arising or otherwise coming into being.

"**KIPAX Agreement**" means that certain Patent Purchase Agreement between Novan and KIPAX AB dated July 27, 2015, as may be amended from time to time.

"**Know-How**" means all non-public information, results and data of any type, in any tangible or intangible form, whether or not patentable, including without limitation practices,

methods, processes, protocols, techniques, specifications, algorithms, formulae, knowledge, skill, experience, databases, studies and procedures.

"**License Agreement(s)**" means, collectively, the In-License Agreements and Out-License Agreements.

"**Licensee**" means the Third Party counterparty to Novan in any Out-License Agreement.

"**Material Adverse Change**" means any material impairment of or material adverse change in (i) the expected value to the Products, the Out-License Agreements, or Product Intellectual Property, (ii) the expected value of the Included Payments, including (A) a material adverse change in the validity or enforceability of any of the In-License Agreements or Out-License Agreements, (B) a material adverse change in the ability of Novan to satisfy and perform any of its obligations under any In-License Agreement or Out-License Agreement, or (C) a material adverse change in the rights or remedies of Novan under any of the In-License Agreement or Out-License Agreement, or (iii) any material adverse change in the business, operations, assets or financial condition of Novan, taken as a whole, that could reasonably be expected to have a material adverse effect on the ability of Novan to perform any of its obligations under this Agreement, or (iv) any material adverse change in the validity, enforceability or transferability of any Product Intellectual Property (including any Third Party's Intellectual Property subject to an In-License Agreement), the status of any challenge to or any litigation involving any Product Intellectual Property (including any Third Party's Intellectual Property under an In-License Agreement), or the restriction, cessation, suspension or termination of Novan's license to any Third Party's Intellectual Property granted under an In-License Agreement.

"**Net Sales**" means, with respect to a Product, the total invoiced sales price received for such Product sold by Novan or its Affiliates less (a) [***], (b) [***], (c) [***], (d) [***], (e) [***], and (f) [***]. Notwithstanding the foregoing, Net Sales shall not include, and shall be deemed zero with respect to, (1) the distribution of reasonable quantities of promotional samples of such Product, or (2) Product provided for clinical trials or research purposes, or charitable or compassionate use purposes.

"**Out-License Agreement**" means, with respect to any Product, any license agreement or other written agreement entered into by Novan and a Third Party whereby Novan grants any rights under any Intellectual Property related to such Product or to any Regulatory Approvals for such Product, in each case for the development and/or Commercialization of such Product by such Third Party in the Territory.

"**Person**" means any individual, firm, corporation, partnership, limited liability company, trust, business trust, joint venture, governmental authority, association or other entity.

"**Phase III Clinical Trial**" means a clinical trial of a Product designed to support approval of an application for Regulatory Approval in the Territory.

"**Product**" means, individually, the SB204 Product, the SB206 Product or the SB414 Product.

"**Product Field of Use**" means, individually, the SB204 Product Field of Use, the SB206 Product Field of Use or the SB414 Product Field of Use.

"**Product Intellectual Property**" means all of the Intellectual Property necessary for the development, manufacture, use, sale, offer for sale and/or importation of the Products in the Territory.

"**Products**" means, collectively, the SB204 Product, the SB206 Product and the SB414 Product.

"**Purchase Price**" has the meaning set forth in Section 2.2.

"**Regulatory Approval**" means, with respect to a particular country or regulatory jurisdiction, all necessary authorizations and approvals by the Regulatory Authorities required to manufacture, use, import, market, distribute and promote a Product in such country or regulatory jurisdiction.

"**Regulatory Authority**" means any national or supranational governmental authority or other governmental body that has responsibility in a given country or jurisdiction over the development, manufacture and/or commercialization of a Product, including FDA.

"**Sales Royalties**" means, collectively, the SB204 Sales Royalty, SB206 Sales Royalty and SB414 Sales Royalty.

"**Sales Royalty Term**" means, on a Product-by-Product, country-by-country basis, the period beginning with the First Commercial Sale of such Product in such country until the last to occur of: (a) [***], (b) [***] and (c) the [***] of the First Commercial Sale of such Product.

"**SB204 Applicable Percentage**" means, with respect to each of the SB204 Net Milestones and SB204 Net Royalties, twenty percent (20%). Notwithstanding the foregoing, until Novan has made payments to Reedy Creek under this Agreement the sum of which equals the Purchase Price, the SB204 Applicable Percentage shall mean, with respect to SB204 Net Milestones, twenty-five percent (25%).

"**SB204 Net Milestones**" means the aggregate, gross amount of upfront fees, milestone payments and equivalent fees or payments received by Novan pursuant to any Out-License Agreement based on the occurrence of events specified in such Out-License Agreement, including the achievement of any milestones, with respect to the SB204 Product in the Territory in the SB204 Field of Use, less any upfront fees, milestone payments and equivalent fees or payments payable by Novan pursuant to any In-License Agreement with respect to the SB204 Product in the Territory in the SB204 Field of Use. SB204 Net Milestones shall not include any Development Payments received by Novan with respect to the SB204 Product.

"**SB204 Net Royalties**" means the aggregate, gross amount of royalty payments and any collections, recoveries, payments, supplements or other compensation made in lieu thereof and any other remuneration of any kind received by or for Novan pursuant to any Out-License Agreement for sales or other transfers of the SB204 Product in the Territory for use in the SB204 Product Field of Use in the Territory, less any royalty payments and any collections recoveries, payments, supplements or other compensation made in lieu thereof and any other remuneration of any kind payable by Novan pursuant to any In-License Agreement with respect to such sales or transfers. For clarity, SB204 Net Royalties shall not include any milestone payments received by or for Novan pursuant to any Out-License Agreements for sales or other transfers of the SB204 Product in the Territory in the SB204 Product Field of Use provided however, such milestone payments shall be included as part of the SB204 Net Milestones. SB204 Net Royalties shall not include any Development Payments received by Novan with respect to the SB204 Product.

"**SB204 Product**" means Novan's pharmaceutical product known as SB204 being developed for the treatment of acne vulgaris in humans, as such product exists as of the Effective Date or as such product may be modified (i) during the development process up to and including the first Regulatory Approval by the FDA and (ii) for the treatment of acne vulgaris in humans from time to time thereafter.

"**SB204 Product Field of Use**" means the treatment of any distinct illness, sickness, interruption, cessation or disorder of a particular bodily function, system, tissue type or organ, or sign or symptom of any such items or conditions, regardless of the severity, frequency or route of any treatment, dosage strength or patient class, for which Regulatory Approval is being sought or has been obtained, including treatment of acne vulgaris in humans.

"**SB204 Rights**" means the right to receive cash in an amount equal to the sum of (a) the product of the SB204 Applicable Percentage multiplied by the SB204 Net Milestones and (b) the product of the SB204 Applicable Percentage multiplied by the SB204 Net Royalties, in each case during the Assigned Rights Period and pursuant to the terms and conditions of this Agreement.

"**SB204 Sales Royalty**" has the meaning set forth in Section 2.3(b).

"**SB206 Applicable Percentage**" means, with respect to each of the SB206 Net Milestones and SB206 Net Royalties, ten percent (10%). Notwithstanding the foregoing, until Novan has made payments to Reedy Creek under this Agreement the sum of which equals the Purchase Price, the SB206 Applicable Percentage shall mean, with respect to SB206 Net Milestones, twenty-five percent (25%).

"**SB206 Net Milestones**" means the aggregate, gross amount of upfront fees, milestone payments and equivalent fees or payments received by Novan pursuant to any Out-License Agreement based on the occurrence of events specified in such Out-License Agreement, including the achievement of any milestones, with respect to the SB206 Product in the Territory in the SB206 Field of Use, less any upfront fees, milestone payments and equivalent fees or

payments payable by Novan pursuant to any In-License Agreement with respect to the SB206 Product in the Territory in the SB206 Field of Use. SB206 Ne Milestones shall not include any Development Payments received by Novan with respect to the SB206 Product.

"**SB206 Net Royalties**" means the aggregate, gross amount of royalty payments and any collections, recoveries, payments, supplements or other compensation made in lieu thereof and any other remuneration of any kind received by or for Novan pursuant to any Out-License Agreement for sales or othe transfers of the SB206 Product in the Territory for use in the SB206 Product Field of Use in the Territory, less any royalty payments and any collections recoveries, payments, supplements or other compensation made in lieu thereof and any other remuneration of any kind payable by Novan pursuant to any In- License Agreement with respect to such sales or transfers. For clarity, SB206 Net Royalties shall not include any milestone payments received by or fo Novan pursuant to any Out-License Agreements for sales or other transfers of the SB206 Product in the Territory in the SB206 Product Field of Us provided however, such milestone payments shall be included as part of the SB206 Net Milestones. SB206 Net Royalties shall not include any Developmen Payments received by Novan with respect to the SB206 Product.

"**SB206 Product**" means Novan's pharmaceutical product known as SB206 being developed for the treatment of molluscum contagiosum in humans, as such product exists as of the Effective Date or as such product may be modified (i) during the development process up to and including the first Regulatory Approval by the FDA and (ii) for the treatment of molluscum contagiosum in humans from time to time thereafter.

"**SB206 Product Field of Use**" means the treatment of any distinct illness, sickness, interruption, cessation or disorder of a particular bodily function, system, tissue type or organ, or sign or symptom of any such items or conditions, regardless of the severity, frequency or route of any treatment, dosage strength or patient class, for which Regulatory Approval is being sought or has been obtained, including treatment of molluscum contagiosum in humans.

"**SB206 Rights**" means the right to receive cash in an amount equal to the sum of (a) the product of the SB206 Applicable Percentage multiplied by the SB206 Net Milestones and (b) the product of the SB204 Applicable Percentage multiplied by the SB206 Net Royalties, in each case during the Assigne Rights Period and pursuant to the terms and conditions of this Agreement.

"**SB206 Sales Royalty**" has the meaning set forth in Section 2.3(b).

"**SB414 Applicable Percentage**" means, with respect to each of the SB414 Net Milestones and SB414 Net Royalties, twenty percent (20%) Notwithstanding the foregoing, until Novan has made payments to Reedy Creek under this Agreement the sum of which equals the Purchase Price, the SB41 Applicable Percentage shall mean, with respect to SB414 Net Milestones, twenty-five percent (25%).

"**SB414 Net Milestones**" means the aggregate, gross amount of upfront fees, milestone payments and equivalent fees or payments received by Novan pursuant to any Out-License

Agreement based on the occurrence of events specified in such Out-License Agreement, including the achievement of any milestones, with respect to the SB414 Product in the Territory in the SB414 Field of Use, less any upfront fees, milestone payments and equivalent fees or payments payable by Nova pursuant to any In-License Agreement with respect to the SB414 Product in the Territory in the SB414 Field of UseSB414 Net Milestones shall not include any Development Payments received by Novan with respect to the SB414 Product.

"**SB414 Net Royalties**" means the aggregate, gross amount of royalty payments and any collections, recoveries, payments, supplements or other compensation made in lieu thereof and any other remuneration of any kind received by or for Novan pursuant to any Out-License Agreement for sales or other transfers of the SB414 Product in the Territory for use in the SB414 Product Field of Use in the Territory, less any royalty payments and any collections, recoveries, payments, supplements or other compensation made in lieu thereof and any other remuneration of any kind payable by Novan pursuant to any In-License Agreement with respect to such sales or transfers. For clarity, SB414 Net Royalties shall not include any milestone payments received by or for Novan pursuant to any Out-License Agreements for sales or other transfers of the SB414 Product in the Territory in the SB414 Product Field of Use, provided however, such milestone payments shall be included as part of the SB414 Net Milestones. SB414 Net Royalties shall not include any Development Payments received by Novan with respect to the SB414 Product.

"**SB414 Product**" means Novan's pharmaceutical product known as SB414 being developed for the treatment of atopic dermatitis in humans, as such product exists as of the Effective Date or as such product may be modified (i) during the development process up to and including the first Regulatory Approval and (ii) for the treatment of atopic dermatitis in humans from time to time thereafter.

"**SB414 Product Field of Use**" means the treatment of any distinct illness, sickness, interruption, cessation or disorder of a particular bodily function, system, tissue type or organ, or sign or symptom of any such items or conditions, regardless of the severity, frequency or route of any treatment, dosage strength or patient class, for which Regulatory Approval is being sought or has been obtained, including treatment of atopic dermatitis in humans.

"**SB414 Rights**" means the right to receive cash in an amount equal to the sum of (a) the product of the SB414 Applicable Percentage multiplied by the SB414 Net Milestones and (b) the product of the SB414 Applicable Percentage multiplied by the SB414 Net Royalties, in each case during the Assigned Rights Period and pursuant to the terms and conditions of this Agreement.

"**SB414 Sales Royalty**" has the meaning set forth in Section 2.3(b).

"**SEC**" means the United States Securities and Exchange Commission or any successor agency thereto.

"**Term**" has the meaning set forth in Section 6.1.

"**Territory**" means the United States of America, Canada, Mexico and each of their territories and possessions.

"**Third Party**" means any Person other than Novan and Reedy Creek and their respective Affiliates.

"**Transfer**" means any sale (or any transaction having the effect of a sale), assignment, conveyance of rights, deed of trust, Encumbrance, exclusive license, seizure or other transfer of any sort and to any degree, voluntary or involuntary, including by operation of law.

"**UNC License Agreement**" means that certain Amended, Restated and Consolidated License Agreement between Novan and The University of North Carolina at Chapel Hill with an effective date of June 27, 2012 and as amended on November 30, 2012, April 12, 2016 and November 1, 2018, and as may be further amended from time to time.

2. PURCHASE OF ASSIGNED RIGHTS; PAYMENTS BY NOVAN

2.1 Purchase of Assigned Rights. Subject to the terms and conditions of this Agreement, Novan hereby sells, assigns, transfers and conveys to Reedy Creek, and Reedy Creek hereby purchases from Novan, all of Novan's right, title and interest in and to the Assigned Rights, free and clear of all liens, mortgages, pledges, leases, options, assignments and security interests ("**Encumbrances**").

2.2 Purchase Price. In consideration of the Assigned Rights, Reedy Creek shall pay to Novan the following payments (collectively, the "**Purchase Price**"): (a) on the Effective Date, Twenty-Five Million United States Dollars ($25,000,000); and (b) contingent on Clinical Trial Success, Ten Million United States Dollars ($10,000,000) to be paid within [***] of the notice of Clinical Trial Success given pursuant to Section 3.2.The Parties acknowledge if Clinical Trial Success is not achieved, the "Purchase Price" shall be automatically adjusted to reflect, as full consideration, the initial payment of $25,000,000 under Section 2.2(a). Payment of the Purchase Price shall be made by wire transfer of immediately available funds to an account designated by Novan. For clarity, Novan shall use the Purchase Price primarily for the purposes of the development and Commercialization of the Products under this Agreement.

2.3 Payments by Novan.

(a) In consideration of the Purchase Price paid by Reedy Creek, Reedy Creek shall be entitled to receive, and Novan shall pay, with respect to each Calendar Quarter during the Assigned Rights Period, the aggregate amount of the following (as applicable):

(i) the product of the SB204 Applicable Percentage and the SB204 Net Milestones received by Novan during such Calendar Quarter;

(ii) the product of the SB204 Applicable Percentage and the SB204 Net Royaltiesreceived by Novan during such Calendar Quarter;

(iii) the product of the SB206 Applicable Percentage and the SB206 Net Milestones received by Novan during such Calenda Quarter;

(iv) the product of the SB206 Applicable Percentage and the SB206 Net Royalties received by Novan during such Calenda Quarter;

(v) the product of the SB414 Applicable Percentage and the SB414 Net Milestones received by Novan during such Calenda Quarter; and

(vi) the product of the SB414 Applicable Percentage and the SB414 Net Royalties received by Novan during such Calenda Quarter.

(b) In the event Novan elects to Commercialize any Product solely using its internal capabilities or through its Affiliates (and without entering any Out-License Agreement), or in the event a successor to Novan following a Change of Control of Novan elects to commercialize any Product usin its internal capabilities or through its Affiliates (and without entering any Out-License Agreement), Novan or such successor of Novan shall notify Reedy Creek of this election and the provisions of Section 2.3(a) shall no longer apply with respect to such Product, and upon such notice, the provisions of this Section 2.3(b) shall apply. In consideration for the Purchase Price by Reedy Creek, effective only upon delivery of the foregoing notice from Novan with respect to a Product, Novan hereby sells to Reedy Creek all of its right, title and interest in and to royalties on Net Sales o such Product in the Territory in the applicable Product Field of Use, with respect to each Calendar Quarter during the Sales Royalty Term, calculated as follows:

(i) if the applicable Product is the SB204 Product, a royalty equal to [***] of Net Sales of the SB204 Product in the SB204 Field Use ("**SB204 Sales Royalty**"),

(ii) if the applicable Product is the SB206 Product, a royalty equal to [***] of Net Sales of the SB206 Product in the SB206 Fie of Use ("**SB206 Sales Royalty**"), and

(iii) if the applicable Product is the SB414 Product, a royalty equal to [***] of Net Sales of the SB414 Product in the SB414 Fie of Use ("**SB414 Sales Royalty**").

(c) All of the foregoing payments in this Section 2.3 shall be made by wire transfer of immediately available funds within [***] following the end of each Calendar Quarter during the Assigned Rights Period or Sales Royalty Term, as applicable, to an account designated by Reedy CreekFor the avoidance of doubt, Reedy Creek shall be entitled to receive the payments set forth in this Section 2.3 notwithstanding the absence

of payment by Reedy Creek under Section 2.2(b) due to failure by Novan to achieve Clinical Trial Success.Amounts payable under Section 2.3 shal not be subject to any setoff or other deduction by reason of any amounts otherwise payable under this Agreement or any other agreement.

(d) In the event that Novan Commercializes a Product both internally under Section 2.3(b) and under Out-License Agreements unde Section 2.3(a), the Included Payment shall be calculated as the aggregate sums calculated and due under Sections 2.3(a) and (b).

(e) In the event that any Contract Party offsets all or any part of the Included Payments against any right, payment or claim of such Contrac Party against Novan or its Affiliates and such offset actually reduces the amount of any payment on the Included Payments (any such reduction, a "**Payment Shortfall**"), Novan will pay Reedy Creek the amount of the Payment Shortfall within [***] of written notice thereof from Reedy Creek After Novan makes the payment to Reedy Creek contemplated in the preceding sentence, Novan shall be entitled to retain any amount subsequentl recovered from such Contract Party in respect of such offset.

2.4 Taxes. All payments under this Agreement shall be made without any deduction or withholding for or on account of any tax, except as set forth in this Section 2.4. The Parties agree to cooperate with one another and use reasonable efforts to minimize obligations for any and all income or other taxes required by Applicable Laws to be withheld or deducted from any of the royalty and other payments made by or on behalf of a Party hereunder ("**Withholding Taxes**"). The applicable paying Party under this Agreement (the "**Paying Party**") shall, if required by Applicable Laws, deduct from any amounts that it is required to pay to the recipient Party hereunder (the "**Recipient Party**") an amount equal to such Withholding Taxes, provided that the Paying Party shall give the Recipient Party reasonable notice prior to paying any such Withholding Taxes. Such Withholding Taxes shall be paid to the proper taxing authority for the Recipient Party's account and, if available, evidence of such payment shall be obtained and sent to recipient within one (1) month of such payment. The Paying Party shall, at the Recipient Party's cost and expense, do all such lawful acts and things and sign all such lawful deeds and documents as the Recipient Party may reasonably request to enable the Paying Party to avail itself of any applicable legal provision or any double taxation treaties with the goal of paying the sums due to the Recipient Party hereunder without deducting any Withholding Taxes.

2.5 Interest. Payment required under this Agreement shall, if overdue, bear interest until payment at a per annum rate one percent (1%) above the prime rate quoted in the Money Rates section of The Wall Street Journal, Eastern Edition for the date on which payment was due, calculated daily on the basis of a 365-day year; provided, however, that in no event shall such rate exceed the applicable maximum legal annual interest rate.

2.6 Acquisition of Assigned Rights Only. Reedy Creek is acquiring no rights other than those expressly assigned herein. For the avoidance of doubt, Reedy Creek is acquiring no rights under any Intellectual Property of Novan, including any Product Intellectual Property.

2.7 Currency. All payments made hereunder shall be in United States Dollars.

2.8 No Assumed Obligations. Reedy Creek is not assuming any liability or obligation of Novan or any of its Affiliates, whether presently in existence or arising or asserted hereafter, whether under any In-License Agreement or otherwise. All such liabilities and obligations shall be retained, paid, performed and discharged by and remain the sole obligations and liabilities of Novan or its Affiliates.

3. ADDITIONAL COVENANTS OF NOVAN

3.1 Development and Commercialization of the Products. During the Term, Novan shall use Commercially Reasonable Efforts to develop obtain Regulatory Approval for and Commercialize the Products. Novan may elect to fulfill the foregoing obligations using its internal capabilities, through its Affiliates or by entering into Out-License Agreements. Promptly after entering into any Out-License Agreement, Novan shall provide to Reedy Creek notic and a copy of such Out-License Agreement. Novan may also utilize the services of Third Parties, including without limitation Third Party contract researc organizations, contract manufacturing organizations, suppliers, partners and other service providers to develop, obtain Regulatory Approval and Commercialize the Products. Additionally, each Calendar Quarter until the First Commercial Sale of a Product and, thereafter, twice per Calendar Year with respect to such Product (or as more frequently reasonably requested by Reedy Creek), Novan will deliver to Reedy Creek a report summarizing it development and Commercialization activities during the prior relevant period. Each such report shall include (i) a summary of services provided by all Third Party contract research organizations, contract manufacturing organizations, suppliers, partners and other service providers; (ii) reports, summaries or other documents provided by or on behalf of Novan relating to the development of or clinical trial performance of a Product (including Phase III Clinical Tria results related to the determination of Clinical Trial Success); (iii) identification of any material Product Intellectual Property developed, created, reduced to practice or acquired by or on behalf of Novan; and (iv) copies of Novan's business plans, financial plans, marketing plans and projections, as well as any filings or submissions to any Regulatory Authority. If an Affiliate and/or Contract Party meets or fulfills any or all of the obligations of Novan under this Agreement, and/or observes any of the terms or conditions hereof, then Novan will be deemed to have met or fulfilled such obligations or observed such terms or conditions, as the case may be.

3.2 Clinical Trial Success. Novan shall promptly notify Reedy Creek upon achieving of Clinical Trial Success. Any notice from Novan claiming that Clinical Trial Success has been achieved shall be accompanied by a publicly released press release of top line results of the Phase III Clinical Trials, and any other documentation or information reasonably requested by Reedy Creek to confirm such achievement. Any dispute regarding the achievement of Clinical Trial Success will be subject to the dispute resolution procedure in Section 9.1.

3.3 Maintenance of Product Intellectual Property. During the Term, Novan shall (a) maintain and not abandon the Product Intellectua Property in the Territory owned by

Novan, including with respect to any Product Intellectual Property comprising issued patents in the Territory, and (b) maintain and not abandon the Produc Intellectual Property in the Territory controlled but not owned by Novan under any In-License Agreement to the extent Novan has the right and obligation t do so under such In-License Agreement.

3.4 Performance under License Agreements. During the Term, Novan shall duly perform and observe all of its respective obligations under each License Agreement in all material respects and maintain in full force and effect the License Agreements. Upon the occurrence of a material breach of any License Agreement by any counterparty thereto, which is not cured as provided therein, Novan shall use Commercially Reasonable Efforts to seek to enforc all of its rights and remedies thereunder. Novan shall not, without the prior written consent of Reedy Creek, which consent shall not be unreasonably withheld, forgive, release or compromise any amount owed to Novan under a License Agreement in a manner which could reasonably be expected to materially adversely affect the Included Payments. Novan shall provide Reedy Creek with written notice as promptly as practicable (and in any event within [***]) upo receiving written notice from a Contract Party terminating or providing notice of termination of any License Agreement, alleging any breach of or default under any License Agreement, or asserting the existence of any facts, circumstances or events which alone or together with other facts, circumstances or events could reasonably be expected (with or without the giving of notice or passage of time or both) to give rise to a breach of or default under or right to terminate such License Agreement. In each such case, Novan's written notice shall include a summary describing in reasonable detail the relevant breach, default or termination event, including a copy of any written notice received from such Contract Party and, describing the corrective action Novan proposes to take Novan shall thereafter use its Commercially Reasonable Efforts to cure such breach.

3.5 Litigation. Novan promptly shall notify Reedy Creek in writing of the commencement of any litigation in respect of the Product Intellectua Property, the License Agreements, or any Third Party's Intellectual Property licensed under an In-License Agreement of which Novan has knowledge, an such notification shall contain full particulars of the event described therein. Novan shall keep Reedy Creek reasonably informed as to the status of any such litigation.

3.6 No Transfer without Consent. During the Term, other than in connection with a Change of Control, Novan shall not Transfer or consent to the Transfer of any portion of its (i) Product Intellectual Property, or (ii) rights in, under, or to any of the License Agreements (including any right to receive al or any portion of any royalty, milestone, or other payment thereunder), without the prior written consent of Reedy Creek. Notwithstanding the foregoing, Novan shall be permitted, and nothing in this Agreement shall restrict Novan's ability, to enter into any Out-License Agreement, lending arrangements that are secured by any Product Intellectual Property or other assets of Novan, or product revenue monetization arrangements similar to this Agreement, provided that in each case the Assigned Rights remain free and clear of any Encumbrances.

3.7 New In-License Agreement In the event that Novan elects to license additional Third Party Intellectual Property or elects to amend a approved In-License Agreement in connection with royalty or milestone payments, structure, or timeline, Novan may present such draft agreement with a Third Party (or, if provision is prohibited, a summary of relevant commercial terms) to Reedy Creek for review and approval. Any approved proposed In-License Agreement shall upon its execution (a copy of which will be provided to Reedy Creek) constitute an "In-License Agreement". In addition, Nova may at any time present an executed agreement to Reedy Creek for review and approval. Reedy Creek shall consider in good faith, and on a commercially reasonable basis, all requests for approval from Novan to add any license or other written instrument granting rights to Novan under Third Party Intellectua Property or to amend any approved In-License Agreement, and not unreasonably withhold or delay any such approvals. Any license or other written instrument entered into by Novan and a Third Party whereby Novan is granted rights under Third Party Intellectual Property that is not so approved may no form part of the calculation of Included Payments.

3.8 Maintenance of Books and Records. During the Term, Novan shall keep and maintain, or cause to be kept and maintained, at all times books and records of account consistent with good business practices and customary industry standards adequate to correctly reflect all payments paid and/or payable with respect to the Assigned Rights and Sales Royalties, as applicable.

3.9 Quarterly Reports. Without limiting the reporting required under Section 3.1, together with payment of any Included Payment, Novan shal prepare and deliver to Reedy Creek a written statement sufficient to compute Novan's calculation of all underlying royalties, milestones, and sales of a Product during such Calendar Quarter, including without limitation an itemized listing of all fees paid to Third Parties pursuant to an In-License Agreement.

3.10 Financial Reports. If at any time Novan is no longer required to publicly disclose audited financial reports with the SEC, on a quarterly basis Novan will promptly provide to Reedy Creek copies of its regularly prepared financial statements, which shall include a balance sheet as of the last date of the applicable quarter and a statement of income and operating expenses with respect to such quarter.

3.11 Inspection Rights. Reedy Creek shall have the right, no more than [***] during each Calendar Year during the Term (as defined below) and for [***] thereafter, to have an independent certified public accountant reasonably acceptable to Novan ("**Audit Representative**") and at Reedy Creek's own expense audit the relevant books and records of account of Novan in connection with the development of the Products, clinical trials, Clinical Tria Success, Commercialization of a Product, any other sales or other transactions used to calculate the Included Payments, and payment of any amounts unde this Agreement during normal business hours, and upon reasonable prior notice, to determine whether appropriate accounting has been performed and payments have been accurately and timely made to Reedy Creek hereunder, for a period covering not more than [***]. The Audit Representative wil execute with Novan a written confidentiality agreement reasonably acceptable to Novan and will disclose to Reedy Creek only such information as is reasonably necessary to provide Reedy

Creek with information regarding any actual or potential discrepancies between amounts reported and actually paid and amounts payable under this Agreement. The Audit Representative will send a copy of the report to Novan at the same time it is sent to Reedy Creek. The report sent to both Parties wi include the methodology and calculations used to determine the results.

3.12 Audit Costs. In the event any audit of the books and records of Novan reveals that the amounts paid to Reedy Creek hereunder for the period of such audit have been understated by more than ten percent (10%) of the amounts determined to be due for the period subject to such audit or Ten Thousand United States Dollars ($10,000), whichever is greater, then the costs incurred by Reedy Creek in respect of such audit shall be borne by Novan and in all other cases, such audit costs shall be borne by Reedy Creek.

3.13 Security Interest. The Parties acknowledge and agree that Parties intend for the sale, assignment, transfer and conveyance of the Assigned Rights and Sales Royalties to constitute a sale of the Assigned Rights and Sales Royalties from Novan to Reedy Creek and not a borrowing, loan or equit investment. Accordingly, Novan shall treat the sale, transfer, assignment and conveyance of the Assigned Rights and Sales Royalties as a sale of an "account" or a "payment intangible" (as applicable) (as each of the foregoing terms is defined by the Uniform Commercial Code in the applicable jurisdiction ("UCC") in accordance with the UCC, and Novan hereby authorizes Reedy Creek to file financing statements naming Novan as the debtor and Reedy Creek as th secured party with respect to the Assigned Rights and Sales Royalties. Without limiting the foregoing, in the event the sale, assignment, transfer and conveyance of the Assigned Rights or Sales Royalties is hereafter held not to be a sale, Novan hereby grants to Reedy Creek, as security for the obligation of Novan hereunder, a first priority security interest in and to all of Novan's right, title and interest in and to the Assigned Rights, Sales Royalties and any "proceeds" (as such term is defined by the UCC) thereof, and Novan hereby authorizes Reedy Creek to file such financing statements as may be necessary t perfect such security interest. Prior to filing any financing statement, Reedy Creek shall provide a copy of such financing statement to Novan to review and provide comments on such financing statement, and shall in good faith take such comments into account. For the avoidance of doubt, nothing in this Agreement shall be deemed to grant a security interest to Reedy Creek in any assets or other property of Novan, including without limitation the Produc Intellectual Property.

3.14 Insurance. During the Term, Novan shall maintain insurance policies with reputable insurance companies that provide coverage in accordance with standards customary for comparable companies, with coverages and in amounts sufficient for the development and Commercialization activities and to comply with any License Agreement and otherwise that is customary for companies of comparable size and condition similarly situated in the same industry as such Persons, including clinical trial, product liability insurance and directors and officers insurance.

4. REPRESENTATIONS AND WARRANTIES OF NOVAN

Novan represents and warrants to Reedy Creek as follows as of the Effective Date.

4.1 Organization. Novan is a duly organized and validly existing corporation in good standing under the laws of the jurisdiction of its incorporation.

4.2 Authorization. Novan has the full right, power and authority to enter into this Agreement and to consummate or cause to be consummated all of the transactions contemplated hereby and to fulfill or cause to be fulfilled all of the obligations of Novan hereunder. The execution and delivery of this Agreement by Novan and the due consummation by Novan of the transactions contemplated hereby have been duly authorized by all necessary action o Novan. This Agreement constitutes a legal, valid and binding agreement of Novan enforceable against Novan in accordance with its terms.

4.3 Consents and Approvals. No consent or approval from any Third Party is required to be made or obtained by Novan in connection wit Novan's execution, delivery and performance of this Agreement, or the consummation of the transactions contemplated hereby.

4.4 Governmental Authorization. The execution and delivery by Novan of this Agreement and the performance of its obligations hereunder, does not require any notice to, action or consent by, or in respect of, or filing with, any Government Authority, except for the filing of financing statements under the UCC.

4.5 No Conflict or Violation. Neither the execution, delivery or performance of this Agreement, nor the consummation of the transactions contemplated hereby will result in a breach by Novan of, or a default by Novan under, any term or provision of any contract, agreement, lease, commitment, license, permit or authorization to which Novan is a party.

4.6 No Litigation. There is no pending, or to the knowledge of Novan or its Affiliates, threatened action, suit, arbitration proceeding, claim, dispute, investigation, governmental or regulatory inquiry against Novan or its Affiliates, which, if adversely determined, would question the validity of, or could reasonably be expected to have a Material Adverse Change on Novan, the Products, the Included Payments, or the transactions contemplated hereby.

4.7 Compliance with Laws. To the knowledge of Novan, Novan (a) is not in violation of, has violated or is under investigation with respect to, and (b) has not been threatened to be charged with or been given notice of any violation of, any law, rule, ordinance or regulation of, or any judgment, order, writ, decree, permit or license entered by any Regulatory Authority applicable to Novan or the Products which would reasonably be expected to have a materia adverse effect on Novan, the Products or the transactions contemplated hereby.

4.8 Product Intellectual Property. To the knowledge of Novan, Novan owns all right, title and interest in, or holds a valid license (enforceable against Novan and to Novan's knowledge the Contract Party thereto) to, the Product Intellectual Property that are required to develop and Commercializ the Products, in each case free and clear of any Encumbrances.

There is no pending or, to the knowledge of Novan, threatened action, suit, proceeding, investigation or claim by any Person to which Novan is a party that claims that the Product Intellectual Property or the development, manufacture, use, sale, offer for sale and/or importation of any Product infringes on any Intellectual Property of any other Person or constitutes misappropriation of any other Person's trade secrets or other Intellectual Property.To the knowledge of Novan, no Third Party has infringed or misappropriated or is now infringing or misappropriating the Product Intellectual Property. Other than the In License Agreements, to Novan's knowledge, no license of rights to Intellectual Property are necessary to be licensed in order for Novan to develop or Commercialize the Products.

4.9 Ownership of Assigned Rights. Novan, immediately prior to the sale of the Assigned Rights, has the power and authority to sell all of the Assigned Rights. Neither Novan nor any of its Affiliates has assigned or sold any right, title, interest or claim in or to the Assigned Rights, other than by Novan to Reedy Creek pursuant to this Agreement. The Assigned Rights are free and clear of any and all Encumbrances. The assignment and transfer of the Included Payments from Novan to Reedy Creek shall not impair in any manner the obligation of a Contract Party to pay royalties or other fees under the applicable agreements with respect to the Product Intellectual Property or Products.

4.10 License Agreements. With respect to each License Agreement, as applicable:

(a) Such License Agreement is in full force and effect and has not been impaired, waived, altered or modified in any respect.

(b) No Contract Party under such License Agreement has been released, in whole or in part, from any of its obligations under such License Agreement in a manner that could reasonably be expected to result in a Material Adverse Change.

(c) There has been no correspondence or any other communication sent by or on behalf of Novan to, or received by or on behalf of Novan from, any Contract Party, the subject matter of which has resulted in or would reasonably be expected to result in a Material Adverse Change, and no breach or dispute has occurred with respect to any payment or other obligations, the subject matter of which has resulted in or would reasonably be expected to result in a Material Adverse Change.

(d) Novan has not received (i) any notice of any Contract Party's intention to terminate such License Agreement in whole or in part or (ii) any notice requesting any amendment, alteration or modification of such License Agreement or any sublicense or assignment thereunder that has not either been withdrawn in writing or reflected in such License Agreement.

(e) No payment required to be made under the terms of any License Agreement has been subject to any claim pursuant to any right of rescission, set-off, counterclaim or defense and no Contract Party to an Out-License Agreement has the right

to rescind, set-off, counterclaim or withhold any payment required to be made under such Out-License Agreement.

(f) Novan has provided true and correct copies of all In-License Agreements to Reedy Creek, including all amendments thereto.

(g) The License Agreement is the legal, valid and binding obligation of Novan and the Contract Party thereto, enforceable against Nova and, to the knowledge of Novan, such Contract Party in accordance with its terms.

4.11 Adverse Data. Novan has disclosed to Reedy Creek all material adverse data relating to the Product and their efficacy and safety in animals and humans and the development and regulatory status known to Novan as of the Effective Date of this Agreement.

4.12 Sufficiency of Assets; Financial Condition. No insolvency proceeding of any character, including, without limitation, bankruptcy, receivership, reorganization, composition or arrangement with creditors, voluntary or involuntary, has been commenced by or against Novan or any of its assets or properties, nor has any such proceeding been threatened. Novan does not contemplate and has not taken any action in contemplation of the institution of any such proceeding. The Purchase Price, together with the available capital of Novan, constitutes sufficient capital for Novan to: (i) pursue the development, Commercialization (through Out-License Agreements and other Third Party arrangements) and Regulatory Approval activities for the SB20 Product in the manner reasonably anticipated under this Agreement for products of similar market potential, and profit potential, with the objective of launching the SB206 Product in the Territory, and (ii) advance programmatically such activities with respect to the SB204 Product and the SB414 Product.

4.13 Debarment. Novan has not utilized and will not utilize, in developing or commercializing the Products, any Person that at such time, to Novan's knowledge, is debarred by FDA or any other Regulatory Authority.

5. REPRESENTATIONS AND WARRANTIES OF REEDY CREEK

Reedy Creek represents and warrants to Novan as follows as of the Effective Date.

5.1 Organization. Reedy Creek is a duly organized and validly existing limited liability company in good standing under the laws of the jurisdiction of its organization.

5.2 Authorization. Reedy Creek has the full right, power and authority to enter into this Agreement and to consummate or cause to be consummated all of the transactions contemplated hereby and to fulfill or cause to be fulfilled all of the obligations of Reedy Creek hereunder. The execution and delivery of this Agreement by Reedy Creek and the due consummation by Reedy Creek of the transactions contemplated hereby have been duly authorized by all necessary action of Reedy Creek. This Agreement constitutes a legal, valid

and binding agreement of Reedy Creek enforceable against Reedy Creek in accordance with its terms.

5.3 Consents and Approvals. No consent or approval from any Third Party is required to be made or obtained by Reedy Creek in connection with Reedy Creek's execution, delivery and performance of this Agreement, or the consummation of the transactions contemplated hereby.

5.4 No Conflict or Violation. Neither the execution, delivery or performance of this Agreement, nor the consummation of the transactions contemplated hereby will result in a breach by Reedy Creek of, or a default by Reedy Creek under, any term or provision of any contract, agreement, lease, commitment, license, permit or authorization to which Reedy Creek is a party.

5.5 No Litigation. There is no pending, or to the knowledge of Reedy Creek, threatened action, suit, arbitration proceeding, claim, investigation, governmental or regulatory inquiry against Reedy Creek which, if adversely determined, would question the validity of, or could reasonably be expected to have a material adverse effect on the transactions contemplated hereby.

6. TERM AND TERMINATION

6.1 Term; Termination. This Agreement shall commence on the Effective Date and will continue for as long as payments are due and payable under this Agreement (the "**Term**").

6.2 Termination by Reedy Creek. If Reedy Creek believes that Novan is in material breach of this Agreement, then Reedy Creek may deliver notice identifying with specificity such alleged breach to Novan. Novan will have sixty (60) days to cure such breach. If Novan fails to cure such breach within such cure period, Reedy Creek may, subject to the remainder of this Section 6.2, terminate this Agreement by providing Novan a written notice at the end of such cure period. Notwithstanding the foregoing, if Novan fails to cure such breach within such cure period, but within such cure period Novan is using good faith efforts to cure such breach, then Reedy Creek may not terminate this Agreement for so long as Novan is using good faith efforts to cure such breach. Notwithstanding the foregoing, if Novan disputes in good faith the existence or materiality of such breach and provides notice to Reedy Creek of such dispute within such cure period, Reedy Creek will not have the right to terminate this Agreement in accordance with this Section 6.2 unless and until it has been determined in accordance with Article 9 that this Agreement was materially breached by Novan and Novan failed to cure such breach within the applicable cure period. It is understood and acknowledged that during the pendency of such a dispute, all of the terms and conditions of this Agreement will remain in effect and the Parties will continue to perform all of their respective obligations hereunder.

6.3 Effect of Termination. Expiration or termination of this Agreement for any reason will not release any Party from any obligations that, at the time of such expiration or

termination, have already accrued to the other Party. The termination of this Agreement, including termination due to the expiration of the Term, shall not terminate the obligation of Novan, or its Affiliates, or assignees, to pay any Included Payment accrued prior to termination. Upon termination of this Agreement, Reedy Creek shall have the right to retain any Included Payment already paid by Novan under this Agreement. If this Agreement is earl terminated by Reedy Creek pursuant to Section 6.2 for a material breach of Section 3.1 and the acts or omissions constituting such breach occurred no more than one year prior to Reedy Creek's notice to Novan of such breach, then, in addition to all other rights and remedies available to it, within thirty (30) days after written notice from Reedy Creek to Novan following the effective date of such termination, Novan shall pay to Reedy Creek an amount equal to the Purchase Price paid by Reedy Creek as of the effective date of termination less any payments made by Novan under this Agreement as of the effective date of termination. In addition, the rights and obligations of the Parties set forth in this Section 6.3 and Articles 1 (to the extent necessary to enforce other surviving rights and obligations of the Parties) and 7-10 shall survive termination or expiration of this Agreement.

7. CONFIDENTIAL INFORMATION

7.1 Confidential Information. During the Term and for a period of [***] thereafter, each Party shall (a) keep Confidential Information of the other Party confidential to the same extent such Party maintains its own information of similar nature (but at a minimum each Party shall use commercially reasonable efforts to maintain such Confidential Information in confidence), (b) not publish or otherwise disclose such Confidential Information to a Third Party, and (c) not use or exploit such Confidential Information for any purpose except for the performance of such Party's obligations or exercise of such Party's rights under this Agreement. Each Party may only disclose Confidential Information of the other Party to those officers, employees, or agents of such Party with a need to know, and only after such officers, employees, or agents have been advised of the confidential nature of such information and are bound by an obligation of confidentiality of similar scope to the terms of this Agreement. If either Party becomes aware or has knowledge of any unauthorized use or disclosure of the other Party's Confidential Information, it shall promptly notify the other Party of such unauthorized use or disclosure.

7.2 Permitted Disclosures. Except with respect to required disclosures under Section 7.3, neither Party shall not make any public announcement of the existence or the terms of this Agreement, without the prior express written consent and approval of the other Party. Each Party may disclose the terms of this Agreement to any of its or its Affiliates' actual or prospective insurers, investors, lenders, business partners or acquirers performing a due diligence review of such Party or its Affiliates, and the agents or advisors of the foregoing, provided such permitted recipients are bound by written or professional obligations of confidentiality for such purpose.

7.3 Required Disclosures. Notwithstanding any other provision of this Agreement, disclosure of Confidential Information shall not be prohibited to the extent such disclosure: (a) is in response to a valid order of a court or Regulatory Authority or (b) is otherwise required by

law, regulation, or the rules of any relevant agency, including the SEC, or body related to a regulated stock exchange; provided, however, that the receiving Party shall, except where not permitted or reasonably feasible under the applicable circumstances of such order or legal requirement, first have given reasonable notice to the other Party in order to allow such Party to object and/or seek a protective order prior to disclosure. With respect to any required filings with the SEC that include disclosure of the terms of this Agreement, each filing Party shall request (to the extent legally permitted) confidential treatment of the terms hereof for which confidential treatment is customarily sought, to the extent such confidential treatment is reasonably available to such Party under the circumstances. In the event of any such filing, the filing Party will provide the other Party with a copy of the Agreement marked to show provisions for which the filing Party intends to seek confidential treatment and shall reasonably consider the other Party's timely comments thereon.

8. INDEMNIFICATION; DISCLAIMER; LIMITATION ON LIABILITY

8.1 Indemnification by Novan. Novan shall defend, indemnify and hold harmless Reedy Creek and its Affiliates and its and their respective directors, officers, managers, employees, and agents (collectively, the "**Reedy Creek Indemnitees**") from and against any and all claims, liabilities, losses, costs, actions, suits, damages and expenses, including reasonable attorneys' fees (collectively, "**Damages**") to the extent arising from any claim, action or proceeding made or brought against any Reedy Creek Indemnitees in connection with: (a) any breach of this Agreement by Novan; (b) the gross negligence or willful misconduct of Novan, its Affiliates and/or Contract Parties in connection with the performance by or on behalf of Novan of Novan's obligations or exercise of its rights under this Agreement; (c) the development, manufacture, use, handling, storage, commercialization, transfer, importation, exportation or labeling of the Products by Novan, its Affiliates or Licensees in the Territory; (d) any infringement or misappropriation of any Intellectual Property of any Third Party by Novan, its Affiliates and/or Licensees in connection with the performance by or on behalf of Novan of Novan's obligations or exercise of Novan's rights under this Agreement; or (e) any violation of any Applicable Laws by Novan, its Affiliates or Licensees; except in any such case to the extent such Damages are attributable to any breach of this Agreement by Reedy Creek, the gross negligence or willful misconduct of Reedy Creek or a Reedy Creek Indemnitee or any violation of any Applicable Laws by Reedy Creek or a Reedy Creek Indemnitee.

8.2 Indemnification Procedure. In the event that Reedy Creek receives notice of any Third Party claim, action or proceeding for which a Reedy Creek Indemnitee claims indemnity hereunder, Reedy Creek, on behalf of such Reedy Creek Indemnitee, shall promptly notify Novan of such matter.Novan shall then promptly assume responsibility for and shall have full control of such matter using counsel reasonably satisfactory to Reedy Creek, including settlement negotiations and any legal proceedings, and Reedy Creek shall, and shall cause the applicable Reedy Creek Indemnitee to, fully cooperate at Novan's expense in Novan's handling and defense thereof. Reedy Creek may participate, at its own expense, in the defense of such claim or litigation provided that Novan shall direct and control the defense of such claim or litigation. Novan shall not, in the defense of such claim or litigation resulting therefrom, consent to entry of any judgment except with the written consent of the Reedy Creek

Indemnitee, which shall not be unreasonably withheld, or enter into any settlement except with the written consent of the Reedy Creek Indemnitee, which shall not be unreasonably withheld, which: (a) does not include as an unconditional term thereof the giving by the plaintiff to the Reedy Creek Indemnitee of a release from all liability in respect of such claim or litigation; or (b) contains any admission of liability.

8.3 Disclaimer. Except as provided under Article 4 and Article 5, each Party expressly disclaims any and all warranties of any kind, express or implied, including without limitation the warranties of design, merchantability, fitness for a particular purpose, noninfringement of Intellectual Property of Third Parties, or arising from a course of dealing, usage or trade practices, in all cases with respect thereto. Without limiting the foregoing, Reedy Creek acknowledges and agrees that Reedy Creek has made its own investigation of the Products and the Product Intellectual Property and is not relying on any implied warranties or upon any representation or warranty as to the future value or amount or potential value or amount of the Assigned Rights or Sales Royalties, as applicable.

8.4 Limitation on Liability. IN NO EVENT SHALL A PARTY BE LIABLE TO THE OTHER PARTY IN CONNECTION WITH AGREEMENT FOR ANY SPECIAL, CONSEQUENTIAL, INDIRECT, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES KIND, INCLUDING LOST PROFITS AND LOST REVENUE, REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT, NEGLIGENCE, STRICT PRODUCT LIABILITY, OR OTHERWISE, EVEN IF INFORMED OF OR AWARE OF THE POSSIBILITY SUCH DAMAGES IN ADVANCE; PROVIDED, HOWEVER, THAT THE FOREGOING LIMITATION WILL NOT LIMIT (A) N OBLIGATION TO INDEMNIFY REEDY CREEK TO THE EXTENT REQUIRED BY SECTION 8.1, OR (B) A PARTY'S LIABIL BREACH OF ARTICLE 7.

9. DISPUTE RESOLUTION

9.1 Resolution by Executive Officers. In the event of any dispute, disagreement or controversy between the Parties arising from or relating to any alleged performance or non-performance of this Agreement or the interpretation or application of this Agreement ("**Dispute**"), the Chief Executive Officer or Manager of each Party (collectively, the "**Executive Officers**"), as applicable, shall attempt to reach a solution satisfactory to both Parties. If the Executive Officers do not reach such solution within a period of [***] or such longer period as the Parties may mutually agree upon, then, upon notice by either Party to the other, such Dispute shall be referred to non-binding mediation with a neutral mediator. If, such Dispute remains unresolved [***] following notice by a Party requesting non-binding mediation, such Dispute shall be adjudicated in accordance with Section 9.2.

9.2 Venue. In the event any Dispute is not resolved pursuant to process set forth in Section 9.1, such Dispute shall be finally resolved exclusively in any state or federal court located in Wake County, North Carolina.

9.3 Emergency Relief. Nothing in this Article 9 shall prevent either Party from immediately seeking injunctive relief from any court of competent jurisdiction.

10. MISCELLANEOUS

10.1 Construction and Interpretation. All terms defined in the singular form shall include the plural and vice versa. Unless otherwise stated, all sections referred to herein are sections of this Agreement. Each of the exhibits referred to in this Agreement and attached hereto, and all attachments and amendments thereto, are and shall be incorporated herein and made a part hereof. The headings of the articles and sections in this Agreement are inserted for convenience only and are not intended to interpret, define or limit the scope or content hereof or any provision hereof. The words "include," "includes" and "including" shall be deemed to be followed by the phrase "but not limited to" unless expressly stated otherwise.

10.2 Choice of Law. This Agreement shall be governed by and construed in accordance with the laws of the State of North Carolina without giving effect to the choice of law provisions thereof.

10.3 Severability. If any provision of this Agreement is held by any competent authority to be invalid or unenforceable in whole or in part, this Agreement shall continue to be valid as to the other provisions hereof and the remainder of the affected provision; provided that if the absence of such provision causes a material adverse change in either the risks or benefits of this Agreement to either Party, the Parties shall negotiate in good faith a commercially reasonable substitute or replacement for the invalid or unenforceable provision.

10.4 Assignment. This Agreement is not assignable by either Party to any Third Party without the prior written consent of the other Party (which consent shall not unreasonably be withheld), provided, however, that each Party may assign this Agreement, without such consent, to an Affiliate of such Party, or in the event of a Change of Control of such Party. The terms and conditions of this Agreement will be binding on and inure to the benefit of the successors and permitted assigns of the Parties. Any attempted assignment in violation of this Section 10.4 shall be null and void.

10.5 Waiver. Any term or provision of this Agreement may be waived at any time by the Party entitled to the benefit thereof only by a written instrument executed by such Party. No delay on the part of Novan or Reedy Creek in exercising any right, power or privilege hereunder will operate as a waiver thereof, nor will any waiver on the part of either Novan or Reedy Creek of any right, power or privilege hereunder operate as a waiver of any other right, power or privilege hereunder nor will any single or partial exercise of any right, power or privilege hereunder preclude any other or further exercise thereof or the exercise of any other right, power or privilege hereunder.

10.6 Relationship of Parties. The Parties are independent contractors, and no agency, franchise, joint venture, employment or other similar relationship is intended or created by this Agreement. No Party hereto shall have any express or implied right or authority to

assume or create any obligations on behalf of or in the name of any other Party or to bind any other Party to any contract, agreement or undertaking with any Third Party.

10.7 Compliance with Applicable Laws. Each Party shall comply with all Applicable Laws in the performance of its obligations under this Agreement.

10.8 Force Majeure. Either Party may suspend performance of any of its obligations (other than an obligation to make payment) under this Agreement, in whole or in part, without liability to the other Party by promptly notifying the other Party of the nature and estimated duration of the suspension period in the event of: act of God, war, riot, fire, explosion, terrorist action, accident, lack of adequate fuel, power, compliance with governmental requests, laws, regulations, orders or actions, breakage or failure of machinery or apparatus, national defense requirements or any other event, whether or not of the classes enumerated herein, beyond the reasonable control of the Party, or in the event of labor trouble, strike, lockout or injunction, which event renders the performance of the obligation commercially impracticable.

10.9 Entire Agreement. The Parties agree that this Agreement constitutes the entire agreement between the Parties relating to the subject matter hereof, and all prior agreements or arrangements, written or oral, between the Parties relating to the subject matter hereof are hereby superseded and merged with this Agreement, including the Summary of Principal Terms dated March 29, 2019.

10.10 Amendment. This Agreement may not be amended, supplemented or otherwise modified except in writing signed by both Parties.

10.11 Counterparts. This Agreement may be executed in two counterparts and by facsimile or PDF signature, each of which shall be deemed an original and which together shall constitute one instrument.

10.12 Notices. All notices required hereunder shall be in writing and shall be made by certified letter, postage prepaid, return receipt requested or next business day delivery service directed to the other Party as provided below:

If to Novan:

Novan, Inc.
4105 Hopson Road
Morrisville, NC 27560
Attn: Chief Executive Officer

With copy (which shall not constitute notice) to:

Smith, Anderson, Blount,
Dorsett, Mitchell & Jernigan, LLP
Wells Fargo Capitol Center

150 Fayetteville Street, Suite 2300
Raleigh, NC 27601
Attn: Gerald F. Roach, Esq.

If to Reedy Creek:

Reedy Creek Investments LLC
100 Matrix Drive, Box 8000
Cary, NC 27513
Attn: Donald R. Parker

With copy (which shall not constitute notice) to:

SAS Institute Inc.
Attn: David B. Keim, Assistant General Counsel
SAS Campus Drive, A7368
Cary, NC 27513
[***]
[***]
[***]

Notice given by certified mail shall be deemed given three (3) days after its deposit in the mail. Notice given by next business day delivery shall be deemed given one (1) business day after its deposit with a next business day delivery courier. Each Party agrees to provide a copy of any such notice by telefax, which copy shall not constitute notice given. Either Party from time to time may change its address or telefax number by giving the other Party notice as provided herein. Notice deposited after the last regularly scheduled pick-up time on a business day will be deemed to have been deposited on the next business day.

10.13 Further Assurances. The Parties will execute and deliver, or cause to be executed or delivered, such further documents and do or cause to be done such further acts and things as may be required to carry out the intent and purpose of this Agreement.

10.14 Use of Names. Neither Party will, without prior written consent of the other Party, use the name or any trademark or trade name owned by the other Party, or owned by an Affiliate of the other Party, in any publication, publicity, advertising, or otherwise, except as expressly permitted by Article 7.

10.15 Third-Party Beneficiary. This Agreement is solely for the benefit of the Parties and their respective successors and permitted assigns, and no other person or entity has any right, benefit, priority or interest under or because of the existence of this Agreement.

10.16 Advice of Counsel. Novan and Reedy Creek have each consulted counsel of their choice regarding this Agreement, and each acknowledges and agrees that this Agreement

shall not be deemed to have been drafted by one Party or another and shall be construed accordingly.

[Signatures Appear on Following Page]

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the Effective Date.

NOVAN, INC.

By:	/s/ George Kelly Martin
Print Name:	George Kelly Martin
Title:	CEO

REEDY CREEK INVESTMENTS LLC

By:	/s/ Donald R. Parker
Print Name:	Donald R. Parker
Title:	Manager

Certain confidential information contained in this exhibit have been omitted by means of redacting a portion of the text and replacing it with [***], pursuant to Regulation S-K Item 601(b) of the Securities Act of 1933, as amended. Certain confidential information has been excluded from this exhibit because it is: (i) not material; and (ii) the registrant treats such information as private or confidential.

Execution Version

DEVELOPMENT FUNDING AND ROYALTIES AGREEMENT

THIS DEVELOPMENT FUNDING AND ROYALTIES AGREEMENT (this "**Agreement**") is made and entered into effective as of May 4, 2019 (the "**Effective Date**") by and between **LIGAND PHARMACEUTICALS INCORPORATED**, a Delaware corporation having a place of business at 3911 Sorrento Valley Boulevard, Suite 110, San Diego, California 92121, U.S.A. ("**Ligand**"), and **NOVAN, INC.**, a Delaware corporation having a place of business at 4105 Hopson Road, Morrisville, North Carolina 27560, U.S.A., and its Affiliates ("**Novan**"). Novan and Ligand may be referred to herein individually as a "**Party**" or collectively as the "**Parties**."

RECITALS

WHEREAS, Ligand is engaged in the development and commercialization of pharmaceutical products;

WHEREAS, Novan owns or otherwise controls certain intellectual property rights and regulatory filings relating to the product designated as SB206, which is the subject of clinical development for molluscum contagiosum;

WHEREAS, Ligand desires to contribute to the funding of the development of the product designated as SB206 in exchange for the right to receive future payments based on the development and commercialization of such product; and

WHEREAS, Novan would like to obtain such funding from Ligand for such development activities, and sell to Ligand the right to receive such future payments, as set forth in this Agreement below.

NOW, THEREFORE, in consideration of the foregoing and of the mutual covenants herein contained, the Parties hereby agree as follows.

ARTICLE 1

DEFINITIONS

The terms in this Agreement with initial letters capitalized, whether used in the singular or the plural, will have the meaning set forth below or, if not listed below, the meaning designated in places throughout this Agreement.

1.1 "**Affiliate**" of a Person means any other Person that (directly or indirectly) is controlled by, controls or is under common control with such initial Person. For the purposes of this definition, the term "control" (and, with correlative meanings, the terms "controlled by" and "under common control with") as used with respect to a Person means: (a) direct or indirect ownership of more than fifty percent (50%) of the voting interest in the Person in question, or more than fifty percent (50%) interest in the income of the Person in question; or (b) other than through ownership of securities, possession, directly or indirectly, of the power to direct or cause the direction of management or policies of the Person in question.

1.2 "**Applicable Law**" means all laws, statutes, ordinances, codes, rules, and regulations that have been enacted by a Governmental Authority and are in force as of the Effective Date or come into force during the Term, in each case to the extent that the same are applicable to the performance by a Party of its obligations, and/or exercise of its rights, under this Agreement.

1.3 "**Bankruptcy Event**" means the occurrence of any of the following in respect of a Person: (a) an admission in writing by such Person of its inability to pay its debts generally or a general assignment by such Person for the benefit of creditors; (b) the filing of any petition or answer by such Person seeking to adjudicate itself as bankrupt or insolvent, or seeking for itself any liquidation, winding-up, reorganization, arrangement, adjustment, protection, relief or composition of such Person or its debts under any Applicable Law relating to bankruptcy, insolvency, receivership, winding-up, liquidation, reorganization, examination, relief of debtors or other similar Applicable Law now or hereafter in effect, or seeking, consenting to or acquiescing in the entry of an order for relief in any case under any such Applicable Law, or the appointment of or taking possession by a receiver, trustee, custodian, liquidator, examiner, assignee, sequestrator or other similar official for such Person or for any substantial part of its property; (c) corporate or other entity action taken by such Person to authorize any of the actions set forth in clause (a) or clause (b) above; (d) without the consent or acquiescence of such Person, the entering of an order for relief or approving a petition for relief or reorganization or any other petition seeking any reorganization, arrangement, composition, readjustment, liquidation, dissolution or other similar relief under any present or future bankruptcy, insolvency or similar Applicable Law, or the filing of any such petition against such Person, or, without the consent or acquiescence of such Person, the entering of an order appointing a trustee, custodian, receiver or liquidator of such Person or of all or any substantial part of the property of such Person, in each case where such petition or order shall remain unstayed or shall not have been stayed or dismissed within ninety (90) days from entry thereof; *provided* that in the case of an involuntary petition, such Person has not challenged such petition within ninety (90) days thereof; (e) the appointment of a trustee, receiver, or custodian for all or substantially all of the property of such Person, or for any lesser portion of such property, if the result materially and adversely affects the ability of such Person to fulfill its obligations hereunder, which appointment is not dismissed within sixty (60) days; or (f) the dissolution or liquidation of such Person.

1.4 "**Business Day**" means any day that is not a Saturday, Sunday or other day on which commercial banks in New York City are authorized or required by Applicable Law to remain closed.

1.5 "**Calendar Quarter**" means the respective periods of three (3) consecutive calendar months ending on March 31, June 30, September 30 and December 31; *provided, however*, that (a) the first Calendar Quarter of the Term will extend from the Effective Date to the end of the first complete Calendar Quarter thereafter, and (b) the last Calendar Quarter of the Term will end upon the expiration or termination of this Agreement.

1.6 "**Calendar Year**" means (a) for the first Calendar Year of the Term, the period beginning on the Effective Date and ending on December 31, 2019, (b) for each Calendar Year of the Term thereafter, each successive period beginning on January 1 and ending twelve (12) consecutive calendar months later on December 31, and (c) for the last Calendar Year of the Term, the period beginning on January 1 of the Calendar Year in which this Agreement expires or terminates and ending on the effective date of expiration or termination of this Agreement.

1.7 "**Change of Control**" means with respect to a Party: (a) the sale or exclusive license of all or substantially all of such Party's assets or business relating to this Agreement to a Third Party; (b) a merger, reorganization or consolidation involving the Party and a Third Party in which the voting securities of the Party outstanding immediately prior thereto cease to represent at least fifty percent (50%) of the combined voting power of the surviving entity immediately after such merger, reorganization or consolidation; or (c) a transaction (which may include a tender offer for such Party's stock or the issuance, sale or exchange of stock of such Party) with a Third Party or Third Parties in which the stockholders of such Party immediately prior to the transaction do not immediately after consummation of such transaction, (i) own, directly or indirectly through one or more intermediaries, stock or other securities of such Party that possess a majority of the voting power of all of such Party's outstanding stock and other securities or (ii) possess the power to elect a majority of the members of such Party's board of directors.

1.8 "**Claims**" has the meaning set forth in Section 7.1.

1.9 "**Commercially Reasonable Efforts**" means, as to Novan and the Product, the level of effort, expertise, and resources required to Develop and Commercialize the Product consistent with the reasonable efforts that would be typically exerted by a biotechnology or pharmaceutical company of comparable size and capabilities as Novan in pursuing the development and commercialization of a similar product with similar product characteristics at a similar stage in its development or product life, including without limitation with respect to commercial potential, the proprietary position of the Product, the regulatory status and approval process and other relevant technical, scientific, medical or legal factors, but not taking into account any competitive product in Novan's portfolio.

1.10 "**Commercialize**," "**Commercializing**," and "**Commercialization**" means activities directed to manufacturing, obtaining pricing and reimbursement approvals for, marketing, promoting, distributing, importing, and/or selling the Product.

1.11 "**Confidential Information**" means any and all technical, business or other information or materials that are disclosed or provided by such Party to the other Party under or in connection with this Agreement and are designated as confidential or would otherwise reasonably be understood to be confidential or proprietary in light of the nature of the information and the circumstances of the disclosure, whether disclosed or provided in oral, written, graphic, or electronic form, which may include without limitation trade secrets, processes, formulae, data, Know-How, improvements, inventions, chemical or biological materials, chemical structures, techniques, clinical, sublicensing and marketing and other Development and/or Commercialization plans, strategies, customer lists, financial data, intellectual property information, tangible or intangible proprietary information or materials or other information in whatever form. For clarity, Confidential Information of Novan shall include all reports delivered by Novan pursuant to this Agreement.

1.12 "**Control**" or "**Controlled**" means, with respect to an item, information, or an intellectual property right, that the applicable Party owns or has a license or other appropriate rights in, to, and under such item, information, or intellectual property right and has the ability to disclose and grant a license or sublicense to the other Party as provided for in this Agreement in, to, and under such item, information, or intellectual property right without violating the terms of any written agreement with any Third Party.

1.13 "**Cover**," "**Covered**," or "**Covering**" means, with respect to a Patent Right, that, in the absence of ownership of or a license under such Patent Right, the manufacture, use, offer for sale, sale or importation of the Product or components thereof would infringe a Valid Claim in such Patent Right.

1.14 "**Development**" means non-clinical, pre-clinical and clinical drug discovery, research, and/or development activities, including without limitation quality assurance and quality control development, and any other activities reasonably related to or leading to the development and submission of information to a Regulatory Authority. When used as a verb, "**Develop**" means to engage in Development.

1.15 "**Development Budget**" has the meaning set forth in Section 2.2.

1.16 "**Development Plan**" has the meaning set forth in Section 2.2.

1.17 "**Disclosing Party**" has the meaning set forth in Section 5.1.

1.18 "**Dollars**" or "**US$**" means the lawful currency of the United States.

1.19 "**Export Control Laws**" means all applicable laws and regulations relating to (a) sanctions and embargoes imposed by the Office of Foreign Assets Control of the U.S. Department of the Treasury or the European Union or (b) the export or re-export of commodities, technologies or services or data including without limitation the Export Administration Act of

1979, 24 U.S.C. §§ 2401-2420; the International Emergency Economic Powers Act, 50 U.S.C. §§ 1701-1706; the Trading with the Enemy Act, 50 U.S.C App. §§ 1 et. seq.; the Arms Export Control Act, 22 U.S.C. §§ 2778 and 2779; and the International Boycott Provisions of Section 999 of the U.S. Intern Revenue Code of 1986, and European Union laws and regulations (including without limitation Regulation (EC) No 428/2009, as amended), in each case a amended.

1.20 "**FCPA**" means the U.S. Foreign Corrupt Practices Act (15 U.S.C. § 78dd-1 et. seq.), as amended.

1.21 "**FDA**" means the United States Food and Drug Administration, or any successor agency thereto.

1.22 "**Field**" means the treatment of any and all indications, diseases, disorders, and/or conditions, including without limitation treatment of molluscum contagiosum in humans.

1.23 "**First Commercial Sale**" means, with respect to a particular product, the first commercial sale for monetary value by Novan, one or more of its Affiliates or one or more of its Licensees in an arm's length transaction to a Third Party that is not a Licensee, including without limitation any final sale to a distributor or wholesaler under any non-conditional sale arrangement, of such Product in the Field in the Territory after Regulatory Approval of such Product has been granted in the Field in the Territory. For the avoidance of doubt, sales or transfers of a Product for clinical and non-clinical research and trials (including studies reasonably necessary to comply with Applicable Law or requests by a Regulatory Authority), early access programs or for compassionate or similar use, shall not be considered a First Commercial Sale.

1.24 "**GAAP**" means generally accepted accounting principles in the United States, consistently applied.

1.25 "**Governmental Authority**" will mean any supranational, federal, national, multinational, regional, provincial, county, city, state, or local government, court, governmental agency, authority, board, bureau, instrumentality, regulatory body, or other political subdivision, domestic or foreign.

1.26 "**Indemnitee**" has the meaning set forth in Section 7.1.

1.27 "**Know-How**" means technical information and materials, including without limitation technology, software, instrumentation, devices, data, biological materials, assays, constructs, compounds, inventions (patentable or otherwise), practices, methods, algorithms, models, knowledge, know-how, trade secrets, skill and experience (including without limitation all biological, chemical, pharmacological, toxicological, clinical, assay and related know-how and trade secrets, and all manufacturing data, manufacturing processes, specifications, assays, quality control and testing procedures, regulatory submissions and related know-how and trade secrets).

1.28 "**Knowledge**" means, with respect to the applicable Party, that the officers of such Party have actual, or reasonably should have, knowledge of facts that make the associated statement true or untrue.

1.29 "**License**" means any agreement pursuant to which Novan grants to a Third Party (a "**Licensee**") a license, sublicense, option, or other right to any Novan Patents or Regulatory Filings or Regulatory Approvals relating to the Products; *provided, however*, that a License shall not include any agreement pursuant to which Novan or any of its Affiliates grants a license or sublicense of any of its intellectual property rights (i) solely to conduct research, (ii) solely to manufacture a Product, or (iii) otherwise to service providers solely on a non-exclusive basis in the ordinary course of Development or Commercialization of a Product (e.g., material transfer agreements, distribution agreements, and consulting agreements).

1.30 "**Licensee**" has the meaning set forth in the definition of License.

1.31 "**Losses**" has the meaning set forth in Section 7.1.

1.32 "**Milestone Payment**" has the meaning set forth in Section 4.2.

1.33 "**NDA**" means a New Drug Application filed with the FDA that is required for approval for Commercialization of a Product in the United States, or its foreign equivalent in the Territory.

1.34 "**Net Sales**" means, with respect to any Product, the total invoiced sales price received for such Product sold by Novan or its Affiliates or Licensees less (a) [***], (b) [***], (c) [***], (d) [***], (e) [***], and (f) [***]. Such Product will be considered sold when paid for. Notwithstanding the foregoing, Net Sales shall not include, and shall be deemed zero with respect to, (1) the distribution of reasonable quantities of promotional samples of a Product, (2) Product provided for clinical trials or research purposes, or charitable or compassionate use purposes or (3) Product provided to any Affiliate or Licensee under an agreement in which Net Sales by such Affiliate or Licensee shall be subject to Royalties under Section 4.3. For the avoidance of doubt, any revenue from sales of Product that is booked by Novan or its Affiliates or Licensees and recorded as revenue in accordance with GAAP will be counted as Net Sales, subject to the deductions set forth above in this Section 1.34, without duplication.

1.35 "**Novan Patents**" means any and all patents and patent applications in the Territory that are Controlled by Novan or its Affiliates and Cover a Product or its manufacture, use, sale, export or import.

1.36 "**Novan Technology**" means berdazimer sodium (NVN1000).

1.37 "**Patent Rights**" means (a) patents and patent applications, and any foreign counterparts thereof, (b) all divisionals, continuations, continuations-in-part of any of the foregoing, and any foreign counterparts thereof, and (c) all patents issuing on any of the foregoing, and any foreign counterparts thereof, together with all registrations, reissues, re-examinations, supplemental protection certificates, substitutions or extensions thereof, and any foreign counterparts thereof.

1.38 "**Person**" means any natural person, firm, corporation, limited liability company, partnership, joint venture, association, joint-stock company, trust, business trust, unincorporated organization, Governmental Authority or any other legal entity, including without limitation public bodies, whether acting in an individual, fiduciary or other capacity.

1.39 "**Prior CDA**" means the Mutual Nondisclosure Agreement between the Parties, effective as of January 21, 2019.

1.40 "**Product**" means (a) SB206 and/or (b) any other pharmaceutical product that incorporates and/or uses the Novan Technology to the extent that such product is Commercialized by Novan and/or its Affiliates or Licensees for the treatment of molluscum contagiosum in humans.

1.41 "**Public Official or Entity**" means (a) any officer, employee (including without limitation physicians, hospital administrators or other healthcare professionals), agent, representative, department, agency, de facto official, representative, corporate entity, instrumentality or subdivision of any government, military or international organization, including without limitation any ministry or department of health or any state-owned or affiliated company or hospital, or (b) any candidate for political office, any political party or any official of a political party.

1.42 "**Purchase Price**" has the meaning set forth in Section 4.1.

1.43 "**Receiving Party**" has the meaning set forth in Section 5.1.

1.44 "**Regulatory Approval**" means approval of an NDA by the FDA for the applicable Product in the United States, or approval by the applicabl Regulatory Authority of a regulatory approval application that is equivalent to an NDA in a country in the Territory other than the United States, and any approvals, licenses, registrations, or authorizations necessary for the manufacture, marketing, and sale of Product in such country and, where relevant, including without limitation any reimbursement or pricing approvals. For the sake of clarity, except as otherwise expressly provided herein, "Regulatory Approval" will not be achieved for a Product in a country or, where applicable, a multinational jurisdiction until any applicable approvals relating to pricing and reimbursement from the relevant Regulatory Authorities have been obtained in such country or such jurisdiction.

1.45 "**Regulatory Authority**" means any national or supranational Governmental Authority, including without limitation FDA, that has responsibility for granting any licenses or approvals or granting pricing and/or reimbursement approvals necessary for the development, marketing, and sale of a Product in any country.

1.46 "**Regulatory Exclusivity**" means any exclusive marketing rights or data exclusivity rights conferred by any Governmental Authority under Applicable Law with respect to a Product in a country or jurisdiction in the Territory to prevent Third Parties from Commercializing such Product in such country or jurisdiction, other than a Patent Right, including without limitation orphan drug exclusivity, pediatric exclusivity, rights conferred in the

U.S. under the Hatch-Waxman Act or the FDA Modernization Act of 1997, in the EU under Directive 2001/83/EC, or rights similar thereto in other countrie or regulatory jurisdictions in the Territory.

1.47 "**Regulatory Filings**" means any and all regulatory applications, filings, modifications, amendments, supplements, revisions, reports, submissions, authorizations, and Regulatory Approvals, and associated correspondence required to Develop and Commercialize Products in the Territory, including without limitation any reports or amendments necessary to maintain Regulatory Approvals.

1.48 "**Royalties**" has the meaning set forth in Section 4.3.1.

1.49 "**Royalty Term**" has the meaning set forth in Section 4.3.2.

1.50 "**SEC**" has the meaning set forth in Section 3.3.2.

1.51 "**SB206**" means the composition described in Investigational New Drug application #137015 in section 3.2.P.2.1, as may be amended from time to time.

1.52 "**Securities Act**" means the Securities Act of 1933, as amended.

1.53 "**Term**" has the meaning set forth in Section 6.1.

1.54 "**Territory**" means the United States, Canada and Mexico and all of their respective territories and possessions.

1.55 "**Third Party**" means any Person other than Novan, Ligand, and their respective Affiliates.

1.56 "**United States**" or "**U.S.**" means the United States of America and all of its territories and possessions.

1.57 "**Valid Claim**" means either (a) a claim of an issued and unexpired patent or a supplementary protection certificate within the Novan Patents that has not been held permanently revoked, unenforceable, or invalid by a decision of a court or other Governmental Authority of competent jurisdiction, unappealable or unappealed within the time allowed for appeal and that is not admitted to be invalid or unenforceable through reissue, disclaimer, or otherwise (i.e., only to the extent the subject matter is disclaimed or is sought to be deleted or amended through reissue), or (b) a claim of a pending patent application within the Novan Patents that has not been abandoned, finally rejected, or expired without the possibility of appeal or refiling.

ARTICLE 2

NOVAN RESPONSIBILITIES; LICENSING; REPORTING

2.1 Responsibilities. Novan will have the sole right, as between the Parties, to Develop and Commercialize Products in the Field, including withou limitation determining the marketing and regulatory strategies for seeking (if and when appropriate) Regulatory Approvals and Regulatory Exclusivity in the Territory for Products in the Field, filing for such Regulatory

Approvals and Regulatory Exclusivity for Products in the Field in the Territory, preparing, submitting, and maintaining any and all Regulatory Filings and Regulatory Approvals for Products in the Field in the Territory, and seeking any necessary Regulatory Approvals of Regulatory Authorities for Product labeling and promotional materials to be used in the applicable jurisdiction(s) in connection with Commercializing Products in the Field. As between the Parties, Novan will be responsible for all costs and expenses incurred by Novan in connection with the foregoing activities, except for the Purchase Price paid by Ligand pursuant to Section 4.1. If an Affiliate and/or a Licensee meets or fulfills any or all of the obligations of Novan under this Agreement, and/or observes any of the terms or conditions hereof, then Novan will be deemed to have met or fulfilled such obligations or observed such terms or conditions, as the case may be.

2.2 Development Plan and Development Budget Novan will conduct the activities set forth in the Development plan set forth on Appendix A (the "**Development Plan**") in accordance with the Development budget set forth on Appendix B (the "**Development Budget**"). Novan may update or modify in good faith the Development Plan and the Development Budget from time to time in its sole discretion without Ligand's consent; *provided* that Novan must obtain Ligand's consent (not to be unreasonably withheld, delayed or conditioned) with respect to any updates or modifications that are not made to implement reasonable and customary modifications in Development activities, or that could reasonably materially adversely affect Ligand's ability to receive Milestone Payments and Royalties under this Agreement. Novan will use the Purchase Price paid by Ligand pursuant to Section 4.1 solely to fund activities in accordance with the Development Plan and the Development Budget, including for the purpose of seeking Regulatory Approval of the Products in the Field each of which may be modified from time to time in accordance with this Section 2.2. Without limiting any other remedies available, if all Development of Products in the Field in the Territory is ceased prior to the first Regulatory Approval of Products in the Territory, Novan will pay to Ligand an amount equal to the Purchase Price less the amounts spent in accordance with the Development Budget on Development activities conducted prior to such cessation.

2.3 Diligence. Novan will use Commercially Reasonable Efforts to carry out its responsibilities under this Agreement. During the Term, Novan will use Commercially Reasonable Efforts to (i) Develop and Commercialize at least one (1) Product in the Field in the Territory, (ii) initiate a Phase 3 trial with respect to at least one (1) Product by [***] and (iii) file an NDA with respect to at least one (1) Product by [***]. Without limiting the foregoing, Novan will use Commercially Reasonable Efforts to perform all of the activities set forth in the Development Plan in accordance with the timelines set forth therein.

2.4 Licensing.

2.4.1 Right to License. Novan will retain the right to perform its activities under this Agreement through Licensees, subject to this Section 2.4. Novan will remain responsible for the performance of Licensees as set forth in this Agreement, including without limitation with respect to all payments due hereunder. Novan will provide Ligand with notice of

the entering into of each License promptly after execution of such License. In addition, Novan will provide a copy of any such License to Ligand after execution of such License. Ligand will treat Licenses as Confidential Information of Novan, subject to the terms of Article 5.

2.4.2 Terms. Each License granted by Novan pursuant to Section 2.4.1 will contain terms and conditions consistent in all material respects with Novan's obligations in this Agreement. Without limiting the foregoing, agreements with any Licensee that include the right to Commercialize any Product will contain provisions consistent with the following: (a) the requirements set forth in Sections 4.4, 4.5, and 8.2.19, and (b) a requirement that such Licensee comply with the confidentiality and non-use provisions of Article 5 with respect to both Parties' Confidential Information.

2.4.3 Subcontracting. Novan may utilize the services of Third Parties, including without limitation Third Party contract research organizations, contract manufacturing organizations, suppliers, partners and service providers to perform its Development and Commercialization activities; *provided* that Novan will remain at all times fully responsible for its respective responsibilities under this Agreement. Any agreement with a Third Party to perform Novan's responsibilities under this Agreement will include confidentiality and non-use provisions which are no less stringent than those set forth in Article 5.

ARTICLE 3

REGULATORY AND PATENT MATTERS

3.1 Regulatory Filings. As between the Parties, Novan will solely own and control any and all Regulatory Approvals and any and all other Regulatory Filings submitted in connection with seeking and maintaining Regulatory Approvals for Products in the Field in the Territory.

3.2 Regulatory Communications. Novan will be the sole contact, as between the Parties, with the applicable Regulatory Authorities and will be solely responsible, using Commercially Reasonable Efforts, for all communications with such Regulatory Authorities that relate to any Regulatory Approvals or other Regulatory Filings prior to and after any Regulatory Approval with respect to Products in the Field in the Territory. If Ligand is required to respond to any requests from or by any and all Regulatory Authorities with respect to any Product, Novan will have an opportunity to comment on the response to the extent such response may materially impact a Product before Ligand submits such response and Ligand will provide a copy of the final response to Novan.

3.3 Reports.

3.3.1 Within [***] after the end of each Calendar Quarter during the Term, Novan will deliver to Ligand a report containing information regarding its Development and Commercialization activities conducted by or on behalf of Novan and its Affiliates and Licensees during such Calendar Quarter. Without limiting the foregoing, such report shall include a

description of all material activities in connection with any Regulatory Approvals and Regulatory Exclusivity for Products in the Field in the Territory, preparing submitting, and maintaining any and all Regulatory Filings and Regulatory Approvals for Products in the Field in the Territory, and seeking any necessary Regulatory Approvals of Regulatory Authorities for Product labeling and promotional materials to be used in the applicable jurisdiction(s) in connection with Commercializing Products in the Field. In addition, such reports shall contain a description of Novan's performance against the activities and timelines set forth in the Development Plan and costs and expenses incurred against the Development Budget.

3.3.2 If at any time Novan is no longer required to publicly disclose audited financial reports with U.S. Securities and Exchange Commission ("**SEC**"), Novan will furnish to Ligand, within [***] after the last day of each quarter, financial statements, which shall include a balance sheet as of the last date of the applicable quarter and a statement of income and operating expenses with respect to such quarter.

3.3.3 Novan will provide Ligand with prompt written notice at such time as (a) Novan becomes insolvent as defined in Applicable Law, including without limitation interpretations in applicable case law; (b) Novan's liabilities (which, for clarity, shall not be deemed to include warrants and preferred stock issued by Novan) exceed its assets; (c) Novan is unable to pay its debts as they become due; (d) there is an occurrence of a default by Novan with respect to any of its debt or payment obligations or any agreement having a materially adverse effect on this Agreement or the Development of Products; (e) Novan suspends, closes, or otherwise ceases to operate a portion of its business having a material adverse effect on Novan's ability to comply with its obligations and/or Ligand's ability to receive payments under this Agreement; or (f) any corporate or other action is taken by Novan for the purpose of effecting any of the foregoing. In addition, if at any time Novan is no longer required to publicly disclose audited financial reports with the SEC, within [***] of a written request of Ligand (such request not to be made more than four times during any Calendar Year), Novan will provide Ligand with its most recent audited financial reports. Ligand will treat all notices and financial reports (and the information contained therein) as Confidential Information of Novan, subject to the terms of Article 5.

3.3.4 It is the intention of the Parties that the sale, transfer, assignment and conveyance of the Royalties contemplated by this Agreement constitute a sale of the Royalties from Novan to Ligand and not a financing transaction, borrowing or loan. In connection therewith, Novan shall treat the sale, transfer, assignment and conveyance of the Royalties as a sale of an "account" or a "payment intangible" (as appropriate) in accordance with the Uniform Commercial Code in the applicable jurisdiction ("**UCC**"), and Novan hereby authorizes Ligand to file financing statements (and continuation statements with respect to such financing statements when applicable) naming Novan as the debtor and Ligand as the secured party in respect of the Royalties. Not in derogation of the foregoing statement of the intent of the Parties in this regard, and for the purposes of providing additional assurance to Ligand in the event that, despite the intent of the Parties, the sale, transfer, assignment and conveyance contemplated hereby is hereafter held not to be a sale, Novan does hereby grant to Ligand, as security for the

obligations of Novan hereunder, a first priority security interest in and to all right, title and interest of Novan, in, to and under the Royalties and any "proceeds" (as such term is defined in the UCC) thereof, and Novan does hereby authorize Ligand, from and after the Effective Date, to file such financing statements (and continuation statements with respect to such financing statements when applicable) as may be necessary to perfect such security interest. Prior to filing any financing statement, Ligand shall provide a copy of such financing statement to Novan to review and provide comments on such financing statement, and shall in good faith take such comments into account.

3.4 Patent Matters.

3.4.1 As between the Parties, Novan will have the sole responsibility, at its expense, for the preparation, filing, prosecution, and maintenance of the Novan Patents, including without limitation any patent term extensions. Novan will provide copies to Ligand of any and all correspondence with the PTO relating to the Novan Patents that are owned by Novan. During the Term, Novan will maintain the Novan Patents owned by Novan comprising issued patents and with respect to the Novan Patents controlled but not owned by Novan, will maintain such Novan Patents to the extent Novan has the right and obligation to do so, in each case in a manner that would not result in a material adverse effect on the Royalties. In no event will Novan permit any of the Novan Patents to be abandoned in any country in the Territory in any manner that could reasonably have a material adverse effect on Ligand's ability to receive the Royalties. Novan will provide Ligand with notice of any decision to abandon any of the Novan Patents at least [***] prior to any abandonment thereof.

3.4.2 In the event that either Party has cause to believe that a Third Party may be infringing or misappropriating any of the Novan Patents in the Field in the Territory, it will promptly notify the other Party in writing, identifying the alleged infringer and the alleged infringement or misappropriation complained of and furnishing the information upon which such determination is based. As between the Parties, Novan will have the sole right to stop such infringement or misappropriation of the Novan Patents by such Third Party in the Field in the Territory or settle with such Third Party. Upon reasonable request by Ligand, Novan will give Ligand all reasonable information with respect to any such enforcement action or settlement. As between the Parties, Novan will bear all costs and expenses (including without limitation any costs or expenses incurred that exceed the amounts recovered by Novan) in pursuing any such enforcement action or settlement and will be responsible for payments awarded against or agreed to be paid by Novan. After deducting any amounts recovered by Novan, its Affiliates and Licensees in connection with the foregoing, whether by settlement or judgment, to reimburse Novan, its Affiliates and Licensees for their respective reasonable costs and expenses in making such recovery, Novan will retain any remainder; *provided* that, solely for purposes of Section 4.3, to the extent such remaining amount constitutes lost profits and/or recovery resulting from sales by a Third Party of a Product in the Territory that infringes a Valid Claim, such remaining amount will be deemed to be Net Sales in the Calendar Quarter in which such amounts were received by or paid, and thereby will be subject to the Royalties payments contemplated in Section 4.3.

3.4.3 Novan will promptly inform Ligand in writing of any actual, threatened, or alleged infringement or misappropriation, based on the making, using, selling, or offering for sale of Products in the Field in the Territory, of a Third Party's intellectual property rights of which it becomes aware.

ARTICLE 4

PAYMENTS

4.1 Purchase Price. In consideration for the rights transferred or granted under this Agreement to Ligand, including without limitation the sale of the Royalties, Ligand will pay Novan a one-time payment of Twelve Million Dollars ($12,000,000) (the "**Purchase Price**") within [***] after the Effective Date to an account designated in writing by Novan.

4.2 Milestone Payments. In partial consideration for the Purchase Price paid to Novan under Section 4.1, Novan will pay Ligand each milestone payment set forth in the table in this Section 4.2 below (each, a "**Milestone Payment**") after the first achievement of the corresponding milestone event set forth in the table in this Section 4.2 below (each, a "**Milestone Event**") for a Product. All such payments are non-refundable and non-creditable. For the avoidance of doubt, each of the Milestone Payments shall be payable no more than one time. Novan will notify Ligand of any achievement of a Milestone Event within [***] after Novan achieves such Milestone Event or otherwise obtains information from its Affiliates and Licensees which establish such achievement. Ligand may submit an invoice to Novan for each Milestone Payment at any time after the corresponding Milestone Event is achieved.Novan will pay any Milestone Payments payable under this Section 4.2 within [***] after the date of Novan's required notice under this Section 4.2.

Milestone Event	Milestone Payment
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

4.3 Royalty Payments.

4.3.1 Royalties on Products. In partial consideration for the Purchase Price paid to Novan under Section 4.1, Novan hereby sells to Ligand all of its right, title, and interest in and to royalties on annual aggregate Net Sales of Products in the Field in the Territory in each Calendar Year during the Royalty Term, in an amount calculated by multiplying the applicable royalty rate in the table below by the corresponding amount of incremental Net Sales of Products

in the Field in the Territory ("**Royalties**"). Novan shall have no right, title, or interest in the Royalties and Novan shall remit all Royalties to Ligand in accordance with Section 4.4. Ligand's ownership interest in the Royalties shall vest upon Novan's receipt of payment of the Purchase Price pursuant to Section 4.1. Ligand is acquiring no rights other than those expressly assigned herein. For the avoidance of doubt, Ligand is acquiring no rights under any intellectual property of Novan, including any Novan Patents.

Net Sales Tier	Royalty Rate
For that portion of annual aggregate Net Sales of Products in the Field in the Territory in a Calendar Year that are less than [***]	[***]
For that portion of annual aggregate Net Sales of Products in the Field in the Territory in a Calendar Year that are greater than or equal to [***] but less than [***]	[***]
For that portion of annual aggregate Net Sales of Products in the Field in the Territory in a Calendar Year that are greater than or equal to [***] but less than [***]	[***]
For that portion of annual aggregate Net Sales of Products in the Field in the Territory in a Calendar Year that are greater than or equal to [***]	[***]

4.3.2 Royalty Term. Royalties will be remitted under this Section 4.3, on a country-by-country basis, commencing on First Commercial Sale of the first Product in such country until the last to occur of: (i) [***]; (ii) [***]; and (iii) the [***] of the First Commercial Sale of such first Product in such country (the **"Royalty Term"**).

4.4 Royalty Reports and Payments. During the Term following the First Commercial Sale of any Product, within [***] after the end of each of the first three (3) Calendar Quarters of each Calendar Year and within [***] after the end of the last Calendar Quarter of each Calendar Year, Novan will pay to Ligand Royalties due for such Calendar Quarter calculated in accordance with Section 4.3 and will deliver to Ligand a Royalties report showing, on a country-by-country basis for the Territory, the information set forth in this Section 4.4 below:

4.4.1 the gross amount invoiced for and the amounts received and the Net Sales resulting from sales of Products sold by Novan, its Affiliates or Licensees during such Calendar Quarter, including without limitation the specific deductions applied in the calculation of such Net Sales amounts, and any amounts required to be included in Net Sales pursuant to Section 3.4.2;

4.4.2 the Royalties (in Dollars) that have accrued in such Calendar Quarter with respect to such Net Sales;

4.4.3 withholding taxes, if any, required by Applicable Law to be deducted with respect to such Royalties; and

4.4.4 the rate of exchange used by Novan in determining the amount of Dollars due hereunder.

If no Royalties are due for any Calendar Quarter hereunder, Novan will so report.Novan will keep, and will require in its Licenses, and use good faith efforts to enforce such requirements, its Licensees and their respective Affiliates to keep (all in accordance with GAAP), complete and accurate records in sufficien detail to properly reflect the Net Sales to enable the Royalties due hereunder to be determined for a period of at least three (3) Calendar Years.

In addition, Novan will deliver to Ligand no later than [***] following the end of each Calendar Quarter a preliminary statement setting forth the actual Ne Sales for the first two (2) months of such Calendar Quarter and estimated Net Sales for the third (3rd) month of such Calendar Quarter, the calculation o Royalties or Net Sales due on a country-by-country basis in the Territory (based on such actual and estimated Net Sales) and, if applicable, the exchange rat to be utilized by Novan to convert a local currency payment to Dollars.

4.5 Audits of Royalty Reports. Upon the written request of Ligand and not more than [***] in any twelve (12) month period, Novan will permit an independent certified public accounting firm selected by Ligand and reasonably acceptable to Novan, at Ligand's expense, to have access during norma business hours to such records of Novan as may be necessary to verify the accuracy of the payment reports made and the amounts owed to Ligand under this Agreement for any Calendar Year period ending not more than [***] prior to the date of such request. Such rights with respect to any Calendar Year will terminate [***] after the end of any such Calendar Year. Ligand will provide Novan with a copy of such accounting firm's written report within thirty (30) days after completion of such report. If such accounting firm concludes that an overpayment or underpayment was made, then the owing Party will pay the amount due within thirty (30) days after the date Ligand delivers to Novan such accounting firm's written report so concluding, and any accrued interest as determined in accordance with Section 4.9 from the date such overpayment was paid or such underpayment was originally due, as applicable, until payment thereof. Ligand will bear the full cost of such audit unless such audit discloses that the additional payment payable by Novan for the audited period is more than five percent (5%) of the amount of the payments due for that audited period or Ten Thousand Dollars, whichever is greater, in which case Novan will pay the reasonable documented fees and expenses charged by the accounting firm. If the Parties dispute any such accounting firm's conclusion, they will resolve such issue pursuant to Article 10. Ligand will treat all information subject to review under Section 4.5 in accordance with the confidentiality provisions of this Agreement.

4.6 Currency of Payments. All payments under this Agreement will be made in Dollars by wire transfer of immediately available funds into an account designated by the Party receiving the funds. Net Sales outside of the U.S. will be first determined in the currency in which they are earned and will then be converted into an amount in Dollars using Novan's

customary and usual conversion procedures used in preparing its financial statements pursuant to GAAP for the applicable reporting period.

4.7 Blocked Currency. In each country in the Territory where the local currency is blocked and cannot be removed from the country, at the election of Ligand, Royalties accrued on Net Sales in such country will be paid to Ligand in local currency by deposit in a local bank in such country designated by Ligand.

4.8 Taxes. Each Party will be solely responsible for the payment of all taxes imposed on its share of income arising directly or indirectly from the efforts of the Parties under this Agreement. The Parties agree to cooperate with one another and use reasonable efforts to reduce or eliminate tax withholding or similar obligations in respect of Royalties, Milestone Payments, and other payments made by Novan to Ligand under this Agreement.To the extent Novan is required under the Internal Revenue Code of 1986, as amended (the **"Code"**), or any other tax laws to deduct and withhold taxes on any payment to Ligand, Novan will deduct from such royalty or other payment the tax amount to be withheld, and Novan will pay the amounts of such taxes to the proper Governmental Authority in a timely manner and promptly transmit to Ligand an official tax certificate or other evidence of such withholding sufficient to enable Ligand to claim such payment of taxes. Upon Novan's reasonable request, Ligand will provide Novan any tax forms that may be reasonably necessary in order for Novan to determine whether to withhold tax on any such payments or to withhold tax on such payments at a reduced rate under the Code or any other tax laws, including without limitation any applicable bilateral income tax treaty. Novan will give reasonable support so that any withholding tax or value added tax may be minimized or avoided to the extent permitted under the Applicable Laws and treaties. Each Party will provide the other with reasonable assistance to enable the recovery, as permitted by Applicable Laws, of withholding taxes, value added taxes, or similar obligations resulting from payments made under this Agreement, such recovery to be for the benefit of the Party bearing such withholding tax or value added tax. Novan will require its Licensees to cooperate with Ligand in a manner consistent with this Section 4.8.

4.9 Interest Due. Novan will pay Ligand interest on any payments that are not paid on or before the date such payments are due under this Agreement at a monthly interest rate equal to the U.S. prime interest rate, as reported by *The Wall Street Journal* (New York edition) for the first Business Day of the month in which such payment was due plus one percentage point (1 ppt), or the maximum applicable legal rate, if less, calculated based on the total number of days payment is delinquent.

ARTICLE 5

NONDISCLOSURE OF CONFIDENTIAL INFORMATION

5.1 Nondisclosure. Each Party agrees that, during the Term and for a period of [***] thereafter (or, for any trade secret, for so long as the Disclosing Party maintains such trade secret as a trade secret), a Party (the "**Receiving Party**") receiving Confidential Information of the

other Party (the "**Disclosing Party**") will (a) maintain in confidence such Confidential Information, (b) not disclose such Confidential Information to any Third Party without the prior written consent of the Disclosing Party, except for disclosures expressly permitted in this Article 5, and (c) not use such Confidential Information for any purpose except those expressly permitted by this Agreement. The Parties agree that any Confidential Information (within the meaning of the Prior CDA) disclosed by the Parties or their Affiliates pursuant to the Prior CDA will be Confidential Information within the meaning of, and will be subject to this Article 5. The Agreement shall be deemed Confidential Information of both Parties.

5.2 Exceptions. The obligations under Section 5.1 will not apply with respect to any portion of Confidential Information of a Disclosing Party that the Receiving Party can show by competent evidence:

5.2.1 at the time of disclosure to Receiving Party is in the public domain;

5.2.2 after disclosure, becomes part of the public domain by publication or otherwise, except by breach of this Agreement by the Receiving Party or anyone to whom the Receiving Party disclosed Confidential Information;

5.2.3 was (a) in the Receiving Party's possession at the time of disclosure without any obligation to keep it confidential or any restriction on its use or (b) subsequently and independently developed by the Receiving Party's employees who had no knowledge of and who did not use, rely on or refer to any of Disclosing Party's Confidential Information, in each case as shown by Receiving Party's records; or

5.2.4 is received by the Receiving Party from a Third Party who has the lawful right to disclose such Confidential Information and who has not obtained such Confidential Information either directly or indirectly from the Disclosing Party.

5.3 Authorized Disclosure. To the extent (and only to the extent) that it is reasonably necessary or appropriate to fulfill its obligations or exercise its rights under this Agreement, the Receiving Party may disclose Confidential Information belonging to the Disclosing Party in the following instances:

5.3.1 prosecuting or defending litigation;

5.3.2 subject to Sections 5.4 and 5.5, required by Applicable Laws (including without limitation the rules and regulations of the SEC or any national securities exchange) and with judicial process; and

5.3.3 to Affiliates in connection with the performance of this Agreement and solely on a need-to-know basis; to potential or actual collaborators (including without limitation actual and potential Licensees), who prior to disclosure must be bound by written obligations of confidentiality and non-use no less restrictive than the obligations set forth in this Article 5; to potential or actual investment bankers, investors, lenders, acquirers, merger partners or other potential financial partners, and their attorneys and agents, who prior to disclosure must be bound by written or professional obligations of confidentiality and non-use no less restrictive

than the obligations set forth in this Article 5; or employees, independent contractors (including without limitation contract research organizations, contract manufacturing organizations, consultants and clinical investigators) or agents, each of whom prior to disclosure must be bound by written obligations of confidentiality and non-use no less restrictive than the obligations set forth in this Article 5; *provided, however*, that the Receiving Party will remain responsible for any failure by any Person who receives Confidential Information pursuant to this Section 5.3.3 to treat such Confidential Information as required under this Article 5.

If and whenever any Confidential Information is disclosed in accordance with this Section 5.3, such disclosure will not cause any such information to cease to be Confidential Information except to the extent that such disclosure results in a public disclosure of such information (other than in breach of this Agreement). Where reasonably possible and subject to Sections 5.4 and 5.5, the Receiving Party will notify the Disclosing Party in writing of the Receiving Party's intent to make such disclosure pursuant to Sections 5.3.1–5.3.3 sufficiently prior to making such disclosure so as to allow the Disclosing Party adequate time to take whatever action appropriate to protect the confidentiality of the information while still permitting such disclosure, and the Receiving Party will cooperate with the Disclosing Party in such efforts.

5.4 Required Disclosure. A Receiving Party may disclose Confidential Information of the Disclosing Party to the extent such disclosure is required pursuant to interrogatories, judicial requests for information or documents, subpoena, civil investigative demand issued by a court or Governmental Authority or as otherwise required by Applicable Law; *provided, however*, that the Receiving Party will notify the Disclosing Party promptly in writing upon receipt thereof, giving (where practicable) the Disclosing Party sufficient advance notice to permit it to oppose, limit or seek a protective order or confidential treatment for such disclosure; and *provided, further*, that the Receiving Party will furnish only that portion of the Confidential Information that it is advised by counsel is legally required whether or not a protective order or other similar order is obtained by the Disclosing Party.

5.5 Securities Filings. In the event a Party proposes to file with the SEC or the securities regulators of any state or other jurisdiction a registration statement or any other disclosure document which describes or refers to this Agreement under the Securities Act, the Securities Exchange Act, of 1934, as amended, or any other applicable securities laws, such Party will notify the other Party in writing of such intention and will provide such other Party with a copy of relevant portions of the proposed filing not less than five (5) days prior to such filing (and any revisions to such portions of the proposed filing a reasonable time prior to the filing thereof), including without limitation any appendices to this Agreement, will consider in good faith the other Party's comments and will use reasonable efforts to obtain confidential treatment of any information concerning this Agreement that such other Party requests, no later than two (2) days prior to such filing, be kept confidential, and will only disclose Confidential Information that it is advised by counsel is legally required to be disclosed. No such notice will be required under this Section 5.5 if the substance of the description of or reference to this Agreement contained in the proposed filing has been included in any previous filing made by the

either Party hereunder or otherwise approved by the other Party (including pursuant to Section 5.6).

5.6 Disclosure of Agreement. Except for a press release and a Current Report on Form 8-K previously approved in form and substance by Ligand and Novan or any other public announcement using substantially the same text as such press release or Form 8-K, or as otherwise permitted under Section 5.3.3 or Section 5.5, neither Party may issue any press release or make any other public statement or other disclosure disclosing to any Third Party any information relating to this Agreement or its terms or the transactions contemplated hereby without the prior written consent of the other Party, such consent not to be unreasonably withheld, delayed, or conditioned; *provided* that either Party shall be entitled to respond to analysts' and investors' questions in the ordinary course and in a manner substantially consistent with any previous disclosure made in accordance with this Section 5.6.

ARTICLE 6

TERM AND TERMINATION

6.1 Term and Expiration. The term of this Agreement will commence on the Effective Date and will continue for as long as payments are due and payable under this Agreement or until such date as this Agreement is sooner terminated in accordance with Section 6.2, 6.3 or 6.4 or by mutual written consent of the Parties (the "**Term**").

6.2 Termination by Ligand. Ligand may terminate this Agreement for any or no reason upon ninety (90) days prior written notice to Novan.

6.3 Termination for Material Breach.

6.3.1 If Ligand believes that Novan is in material breach of this Agreement, then Ligand may deliver notice of such breach to Novan.In such notice Ligand will identify with specificity the alleged breach and the actions or conduct that it wishes Novan to take for an acceptable and prompt cure of such breach; *provided* that such identified actions will not be binding upon Novan with respect to the actions that it may need to take to cure such breach. Novan will have sixty (60) days to cure such breach. If Novan fails to cure such breach within such cure period, Ligand may, subject to Section 6.3.2, terminate this Agreement immediately by providing Novan a written notice at the end of such cure period. Notwithstanding the foregoing, if Novan fails to cure such breach within such cure period, but within such cure period Novan is using good faith efforts to cure such breach, then Ligand may not terminate this Agreement for so long as Novan is using good faith efforts to cure such breach.

6.3.2 Notwithstanding the foregoing, if Novan disputes in good faith the existence or materiality of such breach and provides notice to Ligand of such dispute within such cure period, Ligand will not have the right to terminate this Agreement in accordance with this Section 6.3 unless and until it has been determined in accordance with Article 10 that this Agreement was materially breached by Novan and Novan failed to cure such breach within the applicable cure period. It is understood and acknowledged that during the pendency of such a

dispute, all of the terms and conditions of this Agreement will remain in effect and the Parties will continue to perform all of their respective obligations hereunder.

6.4 Termination for Insolvency. To the extent permitted under Applicable Law, Ligand may terminate this Agreement upon written notice to Novan on or after the occurrence of any Bankruptcy Event relating to Novan.

6.5 Effect of Expiration or Termination of Agreement. Expiration or termination of this Agreement for any reason will not (a) release any Party from any obligation that has accrued prior to the effective date of such expiration or termination, (b) preclude any Party from claiming any other damages, compensation, or relief that it may be entitled to upon such expiration or termination, or (c) terminate any right to obtain performance of any obligation provided for in this Agreement that will survive expiration or termination. Without limiting the foregoing, upon expiration or termination of this Agreement, the rights and obligations of the Parties under this Section 6.5 and Articles 1, 4, 5 (for the term set forth in Section 5.1), 7, 9, 10, and 11 will survive such expiration or termination. Without limiting any other remedies available, if this Agreement is terminated by Ligand pursuant to (x) Section 6.3 for a material breach of Section 2.3 or (y) Section 6.4, then within thirty (30) days following the effective date of such termination, Novan shall pay to Ligand an amount equal to the Purchase Price less any payments made by Novan under this Agreement as of the effective date of termination. Upon expiration of this Agreement or early termination of this Agreement, Ligand will have the right to retain all amounts previously paid to Ligand by Novan.

ARTICLE 7

INDEMNITY

7.1 Novan Indemnity Obligations. Novan will defend Ligand, its Affiliates, and their respective directors, officers, employees, contractors and agents (collectively, the "**Indemnitees**"), and will indemnify and hold harmless the Indemnitees, from and against any liabilities, losses, costs, damages, fees, or expenses incurred by such Indemnitees, and reasonable attorney's fees and other legal expenses with respect thereto, ("**Losses"**) arising out of any allegation, claim, action, lawsuit, or other proceeding ("**Claims**") brought against any Indemnitee to the extent directly resulting from or relating to: (a) any breach by Novan of any of its representations, warranties, covenants, or obligations pursuant to this Agreement, (b) research, Development, manufacturing, Commercialization, transfer, importation or exportation, labeling, handling or storage, or use of or other exploitation of any Product by or on behalf of Novan, its Affiliates, Licensees, distributors, or contractors, including without limitation Claims brought following the Effective Date based on product liability, bodily injury, risk of bodily injury, death, or property damage, (c) any allegations of infringement or misappropriation of the intellectual property of any Third Party with respect to any Product or the Novan Patents, (d) the gross negligence or willful misconduct of Novan, its Affiliates and/or Licensees, or (e) any violation of Applicable Law by Novan, its Affiliates, or Licensees; except in any such case to the extent such Losses and Claims directly result from: (i) the gross negligence or willful misconduct of Ligand

or an Indemnitee, (ii) any breach by Ligand of any of its representations, warranties, covenants, or obligations pursuant to this Agreement, or (iii) any violation of Applicable Law by Ligand or an Indemnitee.

7.2 Procedure. If any Indemnitee intends to claim indemnification under this Article 7, the Indemnitee will promptly notify Novan in writing of any Claim in respect of which the Indemnitee intends to claim such indemnification, and Novan will assume the defense thereof with counsel selected by Novan and reasonably acceptable to the Indemnitee; *provided, however*, that an Indemnitee will have the right to retain its own counsel, with the fees and expenses to be paid by the Indemnitee, if representation of such Indemnitee by the counsel retained by Novan would be inappropriate due to actual or potential differing interests between such Indemnitee and any other Party represented by such counsel in such proceedings. Novan will have the right to control the defense of, and settle, dispose of or compromise any Claims for which it is providing indemnification under this Article 7; *provided* that the prior written consent of the Indemnitee (which will not be unreasonably withheld, delayed, or conditioned) will be required in the event any such settlement, disposition or compromise would adversely affect the interests of the Indemnitee. The failure to deliver notice to Novan within a reasonable time after the commencement of any such action, to the extent prejudicial to Novan's ability to defend such action, will relieve Novan of any liability to the Indemnitee under this Article 7, but the omission to so deliver notice to Novan will not relieve it of any liability that it may have to any Indemnitee otherwise than under this Article 7. The Indemnitee under this Article 7, its employees, and its agents, will cooperate with Novan and its legal representatives in the investigation of any Claim covered by this indemnification.

ARTICLE 8

REPRESENTATIONS, WARRANTIES, AND COVENANTS

8.1 Mutual Representations and Warranties. Each Party represents and warrants to the other Party that:

8.1.1 it has the full right and corporate power and authority to enter into and perform this Agreement;

8.1.2 it has full legal power to extend the rights transferred or granted to the other under this Agreement;

8.1.3 it is not aware of any impediment that would inhibit its ability to perform the terms and conditions imposed on it by this Agreement; and

8.1.4 it has taken all necessary action on its part required to authorize the execution and delivery of this Agreement.

8.2 Further Representations and Warranties, and Covenants, of Novan Novan represents and warrants as of the Effective Date, and, as applicable, Novan covenants, that:

8.2.1 it has enforceable written agreements with all of its employees, consultants, or independent contractors who receive Confidential Information under this Agreement obligating them to keep such information confidential and to use such information only as permitted in this Agreement, and assigning to Novan ownership of all intellectual property rights created in the course of their employment or performance of consulting or contracting services;

8.2.2 as of the Effective Date, it has the full right to transfer and grant the rights to receive payments transferred and granted to Ligand under this Agreement, and is not currently bound by any agreement with any Third Party, or by any outstanding order, judgment, or decree of any court or administrative agency, that restricts it in any way from transferring or granting to Ligand the rights as set forth in this Agreement;

8.2.3 it has not granted as of the Effective Date any right, option, license or interest in or to any Novan Patents or Regulatory Filings that is in conflict with the rights granted to Ligand under this Agreement and Novan will not do any of the foregoing during the Term; it has not granted, or permitted to be attached, any lien, security interest, or other encumbrance with respect to Novan Patents or Regulatory Filings;

8.2.4 Novan will not create, incur, assume or suffer to exist any lien, security interest, or other encumbrance on the Novan Patents or Regulatory Filings, except to the extent that such lien, security interest, or encumbrance does not have an adverse effect on the interest of Ligand under this Agreement, including without limitation the right to receive payments and related information under this Agreement;

8.2.5 Novan will not assign, transfer, convey, or otherwise encumber its right, title, and interest in Novan Patents or Regulatory Filings in a manner that conflicts with any rights transferred or granted to Ligand hereunder, including without limitation by assigning, transferring, or conveying its right, title, and interest in Novan Patents or Regulatory Filings to any Person to which this Agreement (including, for clarity, the obligation to pay to Ligand the Milestone Payments and Royalties) is not contemporaneously assigned, transferred, and conveyed;*provided* that this Section 8.2.5 will not restrict Novan's right to perform its activities under this Agreement through Licensees in accordance with Section 2.4 or to enter into any lending arrangements that are secured by any Novan Patents, Regulatory Filings or other assets of Novan, or product revenue monetization arrangements similar to this Agreement,*provided* that in each case the Milestone Payments and Royalties remain free and clear of any lien, security interest, or other encumbrance, and continue to be payable to Ligand in accordance with Article 4;

8.2.6 Novan has no Knowledge of any infringement or misappropriation by any Third Party of any of the Novan Patents or Regulatory Filings as of the Effective Date;

8.2.7 to Novan's Knowledge, Novan Controls, and is unaware of any facts that have lead Novan to suspect that it does not Control,Novan Patents existing as of the Effective Date;

8.2.8 Novan has not utilized and will not utilize, in conducting Development, manufacture, or Commercialization of Products, any Person tha at such time, to Novan's Knowledge, is debarred by FDA or other Regulatory Authority;

8.2.9 Novan has obtained, and during the Term will maintain, all licenses, authorizations, and permissions necessary under Applicable Law for meeting and performing its obligations under this Agreement and all such licenses, authorizations, and permissions are in full force and effect;

8.2.10 All of Novan's activities relating to its use of Novan Patents and Regulatory Filings, and the research, Development an Commercialization of Products pursuant to this Agreement have complied and will comply in all material respects with all Applicable Laws;

8.2.11 Novan has not incurred, will not incur and does not presently intend to incur, debts, liabilities, or other obligations beyond its ability to pay such debts, liabilities, or other obligations as they become absolute and matured. Novan is not subject to any Bankruptcy Event, and no action has beer taken or is intended by Novan or, to its Knowledge, any other Person, to make Novan subject to a Bankruptcy Event;

8.2.12 Novan has no indebtedness for borrowed money of Novan. The fair salable value of Novan's assets (including goodwill minus disposition costs) exceeds the fair value of its liabilities. After giving effect to the transactions described in this Agreement, Novan (a) is not left with unreasonably small capital in relation to its business as presently conducted and (b) is able to pay its debts (including trade debts) as they mature.

8.2.13 Novan shall provide Ligand with written notice as promptly as possible (but in no event more than [***]) after acquiring Knowledge of the occurrence of a Bankruptcy Event in respect of Novan;

8.2.14 the claims and rights of Ligand created by this Agreement to receive the Milestone Payments and Royalties are not and shall not be subordinated to any creditor of Novan or any other Person (other than as a result of Ligand's own election);

8.2.15 Novan and, to its Knowledge, its Affiliates and Licensees and their respective employees and contractors have not, and Novan and its Affiliates will not, and will use good faith efforts to cause its Licensees and their respective employees and contractors to not, directly or indirectly through Third Parties, pay, promise, or offer to pay, or authorize the payment of, any money or give any promise or offer to give, or authorize the giving of anything of value to a Public Official or Entity or other Person for purpose of obtaining or retaining business for or with, or directing business to, any Person, including without limitation Ligand or Novan. Without any limitation to the foregoing, Novan and its Affiliates and Licensees and their respective employees and contractors have not, and Novan and its Affiliates will not, and will use good faith efforts to cause its Licensees and their respective employees and contractors to not, directly or indirectly promise, offer, or provide any corrupt payment, gratuity, emolument,

bribe, kickback, illicit gift, or hospitality or other illegal or unethical benefit to a Public Official or Entity or any other Person;

8.2.16 Novan is aware of all applicable anti-corruption and anti-bribery laws, including without limitation the FCPA, and all applicable anti-corruption laws in effect in the countries in which Novan conducts or will conduct business. Novan and its Affiliates will not, and Novan will use good faith efforts to cause its Licensees and their respective employees and contractors to not, cause any Indemnitees to be in violation of the FCPA, Export Contro Laws, or any other Applicable Laws;

8.2.17 Novan and its Affiliates will fully cooperate and will use good faith efforts to cause its Licensees and their respective employees, contractors, and subcontractors to cooperate fully with Ligand in ensuring compliance with the FCPA, Export Control Laws, and all other Applicable Laws During the Term, Novan will provide Ligand with such due diligence information relating to compliance with the FCPA, Export Control Laws, and othe Applicable Laws by Novan and its Affiliates, subcontractors, and Licensees and their respective principals, directors, officers, employees, representatives, and contractors, as Ligand may reasonably request;

8.2.18 Novan will immediately notify Ligand if Novan has any information or reasonable belief that there may be a violation of the FCPA Export Control Laws, or any other Applicable Law in connection with the performance of this Agreement or the sale of Products in the Territory; and

8.2.19 Neither Novan nor its Affiliates or Licensees will directly or indirectly sell any Product to any Person outside of the Territory tha Novan knows is going to market, distribute, or sell such Product, directly or indirectly, in the Territory. Novan will ensure that reasonable safeguards are put in place so that all Products that are sold by Novan, its Affiliates or its Licensees outside of the Territory will not subsequently be imported into or sold in the Territory.

ARTICLE 9

DISCLAIMER; LIMITATION OF LIABILITY

9.1 DISCLAIMER. EXCEPT AS PROVIDED UNDER ARTICLE 8, EACH PARTY EXPRESSLY DISCLAIMS ANY AN WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OF THE INTELLECTUAL PROPERTY R THIRD PARTIES, OR ARISING FROM A COURSE OF DEALING, USAGE OR TRADE PRACTICES, IN ALL CASES WITH THERETO.

9.2 LIMITATION OF LIABILITY.

9.2.1 NEITHER PARTY WILL BE LIABLE FOR INDIRECT, INCIDENTAL,

CONSEQUENTIAL, SPECIAL, EXEMPLARY, PUNITIVE, OR MULTIPLE DAMAGES ARISING IN CONNECTION WITH THIS AC OR THE EXERCISE OF ITS RIGHTS OR PERFORMANCE OF ITS OBLIGATIONS HEREUNDER, OR FOR LOST PROFITS OR LO ARISING FROM OR RELATING TO ANY BREACH OF THIS AGREEMENT, REGARDLESS OF ANY NOTICE OF SUCH DAMAGES.

9.2.2 NOTWITHSTANDING ANYTHING IN THIS AGREEMENT TO THE CONTRARY, SECTION 9.2.1 WILL NOT LI RESTRICT (A) DAMAGES AVAILABLE FOR BREACHES OF CONFIDENTIALITY OBLIGATIONS UNDER ARTICLE 5, INDEMNIFICATION OBLIGATIONS UNDER ARTICLE 7, OR (C) THE OBLIGATIONS TO PAY MILESTONE PAYMENTS AND RO UNDER SECTIONS 4.2 AND 4.3.

9.3 No Assumed Obligations. Notwithstanding any provision in this Agreement, Ligand is not assuming any liability or obligation of Novan or any of Novan's Affiliates of whatever nature, whether presently in existence or arising or asserted hereafter. All such liabilities and obligations shall be retained by and remain liabilities and obligations of Novan or its Affiliates, as the case may be.

ARTICLE 10

DISPUTE RESOLUTION

10.1 Resolution by Senior Executives. The Parties will seek to settle amicably any and all disputes or differences arising out of or in connection with this Agreement. Any dispute between the Parties will be promptly presented to the Chief Executive Officer of Novan and the Chief Executive Officer o Ligand, or their respective designees, for resolution. Such officers, or their designees, will attempt in good faith to promptly resolve such dispute. Notwithstanding the foregoing, either Party may seek equitable or interim relief or provisional remedy in any court of competent jurisdiction to enforce its rights under this Agreement, including without limitation injunctive relief and specific performance, without having to prove actual damages or post a bond. If the Chief Executive Officers of the Parties, or their respective designees, are unable to resolve a given dispute within [***] of the matter being referred to them either Party may have the dispute adjudicated in accordance with Section 10.2.

10.2 Applicable Law and Venue. This Agreement will be governed by, enforced, and will be construed in accordance with the laws of the State of New York, United States of America without regard to any Applicable Law, rule, or principle that would result in the application of the laws of any other jurisdiction. All actions and proceedings arising out of or relating to this Agreement will be heard and determined exclusively in any New York State or federal court sitting in the Southern District of New York, and each Party hereby irrevocably consents to personal jurisdiction and venue in, and agrees to service of process issued or authorized by, such court in any such action or proceeding and irrevocably waive any defense of an inconvenient forum to the maintenance of any such action or proceeding. Notwithstanding

the foregoing, either Party may seek injunctive relief in any court in any jurisdiction where appropriate.

ARTICLE 11

MISCELLANEOUS

11.1 Assignment.

11.1.1 Novan shall not enter into an agreement after the date hereof (i) with respect to a Change of Control of Novan or (ii) whereby Novan directly or indirectly sells, licenses, conveys, assigns or otherwise transfers all or any significant portion of its Regulatory Filings, Know-How, Patent Rights or other intellectual property rights or interests in and to any Product to a Third Party unless, in each case, such Third Party that succeeds to the rights of Novan to develop such Product assumes the obligations of Novan contained in this Agreement with respect to the development of such Product (including, without limitation, the obligations set forth in Sections 2.2 and 2.3 of this Agreement and the obligation to pay to Ligand the Milestone Payments and Royalties) and Novan assigns all of the applicable Novan Patents and Regulatory Filings to such Third Party*provided* that this Section 11.1.1 will not restrict Novan's right to perform its activities under this Agreement through Licensees in accordance with Section 2.4.

11.1.2 This Agreement may not be assigned or otherwise transferred by either Party without the consent of the other Party, which consent will not be unreasonably withheld, delayed, or conditioned; *provided, however*, that either Party may, without such consent, assign this Agreement together with all of its rights and obligations hereunder to its Affiliates, or to a successor in interest in connection with the transfer or sale of all or substantially all of its business to which this Agreement relates, or in the event of a Change of Control, subject in each case to Section 11.1.1 and the assignee or successor-in-interest agreeing to be bound by the terms of this Agreement. Any purported assignment in violation of this Section 11.1 will be void. Any permitted assignee or successor will assume and be bound by all obligations of its assignor or predecessor under this Agreement.

11.2 Severability. If any provision of this Agreement is held to be invalid or unenforceable, all other provisions will continue in full force and effect, and the Parties will substitute for the invalid or unenforceable provision a valid and enforceable provision which conforms as nearly as possible with the original intent of the Parties.

11.3 Notices. Any notice or other communication to a Party pursuant to this Agreement will be sufficiently made or given on the date it was sent; *provided* that such notice or other communication is sent by first class certified or registered mail, postage prepaid, or is sent by next day express delivery service, addressed to it at its address in this Section 11.3, below, or to such other address as the Party to whom notice is to be given may have furnished to the other Party in writing in accordance herewith.

If to Ligand:

Ligand Pharmaceuticals, Inc.
3911 Sorrento Valley Boulevard, Suite 110
San Diego, California 92121, U.S.A.
Attention: Chief Financial Officer

With copies to (which alone will not constitute notice):

Ligand Pharmaceuticals, Inc.
3911 Sorrento Valley Boulevard, Suite 110
San Diego, California 92121, U.S.A.
Attention: General Counsel

and

Latham & Watkins LLP
12670 High Bluff Drive
San Diego, CA 92130
Attention: Matthew Bush

If to Novan, to:

Novan, Inc.
4105 Hopson Road
Morrisville, NC 27560, U.S.A.
Attn: Chief Executive Officer

With copies to (which alone will not constitute notice):

Smith, Anderson, Blount,
Dorsett, Mitchell & Jernigan, LLP
Wells Fargo Capitol Center
150 Fayetteville Street, Suite 2300
Raleigh, NC 27601, U.S.A.
Attn: Gerald F. Roach, Esq.

11.4 Expenses. Except as expressly set forth in this Agreement or as may be specifically agreed to in writing by Novan and Ligand, each Party wil be responsible for all costs and expenses it incurs in connection with this Agreement.

11.5 Headings. The headings of Articles and Sections of this Agreement are for ease of reference only and will not affect the meaning or interpretation of this Agreement in any way.

11.6 Waiver. The failure of either Party in any instance to insist upon the strict performance of the terms of this Agreement will not be construed to be waiver or relinquishment of any of the terms of this Agreement, either at the time of the Party's failure to insist upon strict performance or at any time in the future, and such terms will continue in full force and effect.

11.7 Counterparts; Electronic Delivery. This Agreement and any amendment may be executed in one or more counterparts (including without limitation by way of PDF or electronic transmission), each of which will be deemed an original, but all of which together will constitute one and the same instrument. When executed by the Parties, this Agreement will constitute an original instrument, notwithstanding any electronic transmission, storage and printing of copies of this Agreement from computers or printers. For clarity, PDF signatures will be treated as original signatures.

11.8 Use of Names. Neither Party will, without prior written consent of the other Party, use the name or any trademark or trade name owned by the other Party, or owned by an Affiliate of the other Party, in any publication, publicity, advertising, or otherwise, except as expressly permitted by Article 5.

11.9 Independent Contractors. Nothing contained in this Agreement will be deemed to constitute a joint venture, partnership, or employer-employee relationship between Ligand and Novan, or to constitute one as the agent of the other. Neither Party will be entitled to any benefits applicable to employees of the other Party. Both Parties will act solely as independent contractors, and nothing in this Agreement will be construed to make one Party an agent, employee, or legal representative of the other Party for any purpose or to give either Party the power or authority to act for, bind, or commit the other Party.

11.10 Entire Agreement. This Agreement, together with the Appendices attached hereto, constitutes the entire agreement and understanding between the Parties with respect to the subject matter hereof, and supersedes all prior or contemporaneous proposals, oral or written, confidentiality agreements, and all other communications between the Parties with respect to such subject matter, including without limitation the Prior CDA.

11.11 Modifications. The terms and conditions of this Agreement may not be amended or modified, except in writing signed by both Parties.

11.12 Exports. The Parties acknowledge that the export of technical data, materials, or products is subject to the exporting Party receiving any necessary export licenses and that the Parties cannot be responsible for any delays attributable to export controls which are beyond the reasonable control of either Party. Novan and Ligand agree not to export or re-export, directly or indirectly, any information, technical data, the direct product of such data, samples, or equipment received or generated under this Agreement in violation of any applicable export control laws.

11.13 Further Assurances. Each Party agrees to do and perform all such further reasonable acts and things and will execute and deliver such other agreements, certificates, instruments, and documents necessary to carry out the intent and accomplish the purposes of this Agreement and to evidence, perfect, or otherwise confirm the other Party's rights hereunder.

Novan shall make available to Ligand such information as Ligand may, from time to time, reasonably request with respect to the right to receive payments under this Agreement.

11.14 Interpretation.

11.14.1 This Agreement was prepared in the English language, which language will govern the interpretation of, and any dispute regarding, the terms of this Agreement.

11.14.2 Each of the Parties acknowledges and agrees that this Agreement has been diligently reviewed by and negotiated by and between them, that in such negotiations each of them has been represented by competent counsel and that the final agreement contained herein, including without limitation the language whereby it has been expressed, represents the joint efforts of the Parties and their counsel. Accordingly, in the event an ambiguity or a question of intent or interpretation arises, this Agreement will be construed as if drafted jointly by the Parties and no presumption or burden of proof will arise favoring or disfavoring any Party by virtue of the authorship of any provisions of this Agreement.

11.14.3 The definitions of the terms herein will apply equally to the singular and plural forms of the terms defined. Whenever the context may require, any pronoun will include the corresponding masculine, feminine, and neuter forms. The word "any" will mean "any and all" unless otherwise clearly indicated by context.

11.14.4 Unless the context requires otherwise, (a) any definition of or reference to any agreement, instrument, or other document herein will be construed as referring to such agreement, instrument, or other document as from time to time amended, supplemented, or otherwise modified (subject to any restrictions on such amendments, supplements or modifications set forth herein or therein), (b) any reference to any Applicable Laws herein will be construed as referring to such Applicable Laws as from time to time enacted, repealed, or amended, (c) any reference herein to any Person will be construed to mean the Person's successors and assigns (after any such succession or assignment), (d) the words "herein", "hereof" and "hereunder", and words of similar import, will be construed to refer to this Agreement in its entirety and not to any particular provision hereof, and (e) all references herein to Articles, Sections, or Appendices, unless otherwise specifically provided, will be construed to refer to Articles, Sections, and Appendices of this Agreement.

11.14.5 References to sections of the Code of Federal Regulations and to the United States Code will mean the cited sections, as these may be amended from time to time.

11.15 Force Majeure Event Except for the payment of money, neither Party will be in breach or default, nor will either Party be liable or responsible to the other Party for losses or damages, nor will either Party have the right to terminate this Agreement, for any breach, default or delay by the other Party that is attributable to an event beyond their reasonable control, including without limitation acts of God, acts of government (including without limitation injunctions), fire, flood, earthquake, strike, lockout, labor dispute, breakdown of plant, shortage of equipment or supplies, loss or unavailability of manufacturing facilities or materials, casualty or accident, stoppage or interruption of transportation or utilities, civil commotion, acts of public

enemies, acts of terrorism or threat of terrorist acts, blockage or embargo and the like (each, a "**Force Majeure Event**"); *provided, however*, that such Party will use reasonable efforts to avoid and/or minimize the impact of such occurrence, and give prompt written notice of any Force Majeure Event to the other Party.

[*Signature Page Follows*]

IN WITNESS WHEREOF, each of the Parties has caused its duly authorized officer to execute and deliver this Agreement as of the Effective Date.

LIGAND PHARMACEUTICALS INCORPORATED

By:	/s/ Charles Berkman
Name:	Charles Berkman
Title:	SVP, GC & Secretary

NOVAN, INC.

By:	/s/ G. Kelly Martin
Name:	G. Kelly Martin
Title:	CEO

Appendix A

Development Plan

[***]

Appendix B

Development Budget

[***]

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

Novan, Inc.
Durham, North Carolina

We hereby consent to the incorporation by reference in the Registration Statements on Form S-1 (No. 333-233632), Form S-3 (No. 333-236583) and Form S-8 (No. 333-213854, No. 333-219913, No. 333-233630, No. 333-233631, and No. 333-258743) of Novan, Inc. of our report dated February 18, 2022, relating to the consolidated financial statements, which appears in this Form 10-K. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

/s/ BDO USA, LLP
Raleigh, North Carolina

February 18, 2022

Exhibit 31.1

CERTIFICATION OF PERIODIC REPORT UNDER SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002

I, Paula Brown Stafford, certify that:

1. I have reviewed this annual report on Form 10-K of Novan, Inc. (the "registrant");

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 Rules 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.

By: /s/ Paula Brown Stafford

February 18, 2022

Paula Brown Stafford
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF PERIODIC REPORT UNDER SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002

I, John M. Gay, certify that:

1. I have reviewed this annual report on Form 10-K of Novan, Inc. (the "registrant");

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 Rules 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.

By: /s/ John M. Gay

February 18, 2022

John M. Gay
Chief Financial Officer
(Principal Financial 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

I, Paula Brown Stafford, Chief Executive Officer of Novan, Inc. (the "Company"), do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

(1) the Annual Report on Form 10-K of the Company for the year ended December 31, 2021 (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 results of operations of the Company for the periods presented therein.

Date: February 18, 2022

/s/ Paula Brown Stafford
Paula Brown Stafford
Chief Executive Officer
(Principal Executive Officer)

This certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. § 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, and shall not be deemed "filed" by the Company for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and shall not be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Report, irrespective of any general incorporation language contained in such filing.

A signed original of this written statement required by Section 906 of the Sarbanes-Oxley Act of 2002 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002

I, John M. Gay, Chief Financial Officer of Novan, Inc. (the "Company"), do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

(1) the Annual Report on Form 10-K of the Company for the year ended December 31, 2021 (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 results of operations of the Company for the periods presented therein.

Date: February 18, 2022

/s/ John M. Gay
John M. Gay
Chief Financial Officer
(Principal Financial Officer)

This certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. § 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, and shall not be deemed "filed" by the Company for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and shall not be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Report, irrespective of any general incorporation language contained in such filing.

A signed original of this written statement required by Section 906 of the Sarbanes-Oxley Act of 2002 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.