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

FORM 10-K

☒ **Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934**

For the fiscal year ended December 31, 2022

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: 001-38241

OPTINOSE, INC.

(Exact name of registrant as specified in its charter)

Delaware	**42-1771610**
(State of other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)

1020 Stony Hill Road, Suite 300
Yardley, Pennsylvania 19067
(Address of principal executive offices, including zip code)

(267) 364-3500
(Registrant's telephone number, including area code)

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, $0.001 par value	OPTN	The Nasdaq Global Select Market

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

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

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 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, a smaller reporting company, or an emerging growth company. See the definitions of “large accelerated filer,” “accelerated filer,” “smaller reporting company,” and “emerging growth company” in Rule 12b-2 of the Exchange Act.

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

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

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

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

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

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

As of June 30, 2022 (the last business day of the registrant's most recently completed second fiscal quarter), the aggregate market value of the registrant's common stock held by non-affiliates was approximately $201.7 million based on the last reported sale price of the registrant's common stock on the Nasdaq Global Select Market on June 30, 2022.

The number of shares of common stock outstanding at March 1, 2023 was 111,810,073 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant’s definitive proxy statement for its 2023 annual meeting of stockholders are incorporated by reference into Part III of this Form 10-K where indicated. Such definitive proxy statement will be filed with the U.S. Securities and Exchange Commission within 120 days after the year ended December 31, 2022.

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Unless the context otherwise requires, all references in this Form 10-K to "Optinose," "Company," "we," "us," and "our" refer to OptiNose, Inc. and its subsidiaries.

Trademark Notice

This Form 10-K contains references to our trademarks and to trademarks belonging to other entities. OPTINOSE®, XHANCE®, EDS® and EXHALATION DELIVERY SYSTEM™ are trademarks of Optinose in the United States. All other trademarks, trade names and service marks appearing in this Form 10-K are the property of their respective owners. We do not intend our use or display of other companies' trade names or trademarks to imply a relationship with, or endorsement or sponsorship of us by, any other companies.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Form 10-K contains “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. These statements include, among others, statements relating to:

- the potential uses for and advantages of XHANCE®, our product candidates and the Exhalation Delivery System (EDS) and related technologies;
- our planned activities in pursuit of a follow-on indication for chronic sinusitis;
- the potential for XHANCE to be the first product approved by the U.S. Food and Drug Administration (FDA) for the treatment of chronic sinusitis;
- our expectation that the FDA will accept for filing the supplemental new drug application (sNDA) that we submitted in February 2023 for XHANCE for the treatment of chronic sinusitis, and our expectation that, assuming FDA acceptance of the sNDA submission and a standard review period, that the FDA target action date will be in December 2023;
- the potential to expand into the primary care segment and our plans to seek a partner for such expansion;
- our belief that the current practice of postoperative intranasal steroid (INS) use could support XHANCE’s adoption as a maintenance therapy to improve outcomes following sinus surgery;
- the potential for XHANCE to be the standard of care for the treatment of chronic rhinosinusitis with and without nasal polyps;
- the potential for direct-to-consumer (DTC) advertising to be a future driver of XHANCE prescription growth;
- the potential benefits of our patient affordability programs and their potential effect on XHANCE demand and financial results;
- our ability to maintain sufficient inventory of XHANCE and for our manufacturers to timely supply XHANCE;
- our expectation for XHANCE prescriptions to be impacted by the seasonality observed in the INS market and the seasonal variation in patient visits with their doctor;
- our expectation for XHANCE prescriptions and average net revenue per prescription to be adversely impacted by the annual resetting of patient healthcare insurance plan deductibles and changes in individual patients' healthcare insurance coverage, both of which often occur in January;
- XHANCE prescription, net revenue, market share and other business trends;
- the potential for increasing rates of enforcement of payor utilization management criteria to negatively impact XHANCE prescription volumes;
- our belief that the restrictions imposed on the logistics and frequency of territory managers' visits during the COVID-19 pandemic have now become permanent in some physician offices;
- our expectation that the research and development costs will significantly decrease in 2023 as compared to 2022;
- our expectation that our operating expenses consisting of selling, general and administrative and research and development in 2023 will be between $90.0 million and $95.0 million and that our non-cash stock-based compensation expense will be approximately $8.0 million;
- our expectation that XHANCE net product revenues for the full year of 2023 will be between $62.0 million and $68.0 million and our expectation that XHANCE net product revenues for the first quarter 2023 will be approximately $10.0 million;
- our expectation that the average net product revenue per prescription for XHANCE for the full year of 2023 will be approximately $200;

- our potential non-compliance with certain covenants of the A&R Note Purchase Agreement, and the consequences of failing to achieve compliance with such covenants or obtain a waiver or modification of such covenants;
- our belief that our existing cash and cash equivalents will be sufficient to fund our operations and debt service obligations for approximately the next 12 months if we are able to maintain compliance with the financial and other covenants and terms of the A&R Note Purchase Agreement or obtain a waiver to or modification of such covenants;
- our expectations and the accuracy of our estimates regarding our future expenses, revenue, capital requirements, potential sources of capital and consequences of failing to obtain additional capital;
- our ability to continue as a going concern;
- the rate and degree of market acceptance and market opportunity of XHANCE;
- our ability to maintain regulatory approval of XHANCE;
- our ability to attract collaborators with development, regulatory and commercialization expertise;
- regulatory developments in the United States and foreign countries;
- our ability to operate our business without infringing the intellectual property rights of others;
- the scope and duration of patent protection and other barriers to entry that we expect to benefit XHANCE;
- the performance of our third-party suppliers, manufacturers, wholesalers, distributors and preferred pharmacy network (PPN) partners;
- the potential for us to decrease our reliance on sole-source suppliers and increase the third party manufacturing capacity that is available to us;
- the success of competing products that are or become available;
- our belief that our facilities meet our needs and that we could obtain alternative space on commercially reasonable terms;
- our expectations regarding our ability to obtain and adequately maintain sufficient intellectual property protection for XHANCE;

as well as other statements relating to our future operations, financial performance and financial condition, prospects, strategies, objectives or other future events. Forward-looking statements appear primarily in the sections of this Form 10-K entitled "Item 1 - Business," "Item 1A - Risk Factors," and "Item 7 - Management's Discussion and Analysis of Financial Condition and Results of Operations". In some cases, you can identify forward-looking statements by words such as "may," "will," "could," "would," "should," "expect," "intend," "plan," "anticipate," "target," "believe," "estimate," "predict," "project," "potential," "continue," "ongoing," "scheduled" and similar expressions, although not all forward-looking statements contain these identifying words.

Forward-looking statements are based upon our current expectations and assumptions and are subject to a number of known and unknown risks, uncertainties and other factors that could cause actual results to differ materially and adversely from those expressed or implied by such statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed under section "Item 1A - Risk Factors" of this Form 10-K. As a result, you should not place undue reliance on forward-looking statements.

Additionally, the forward-looking statements contained in this Form 10-K represent our views only as of the date of this Form 10-K (or any earlier date indicated in such statement). While we may update certain forward-looking statements from time to time, we specifically disclaim any obligation to do so, even if new information becomes available in the future. However, you are advised to consult any further disclosures we make on related subjects in the reports that we file with the SEC.

The foregoing cautionary statements are intended to qualify all forward-looking statements wherever they may appear in this Form 10-K. For all forward-looking statements, we claim the protection of the safe harbor for forward-looking statements contained in the Private Securities Litigation Reform Act of 1995.

RISK FACTOR SUMMARY

The risk factors summarized below could materially harm our business, operating results and/or financial condition, impair our future prospects and/or cause the price of our common stock to decline. For more information, see “Item 1A. Risk Factors” in this Annual Report on Form 10-K for the year ended December 31, 2022. Material risks that may affect our business, operating results and financial condition include, but are not necessarily limited to, the following:

Risks Related to Our Financial Position and Capital Resources

- We have identified conditions and events that raise substantial doubt about our ability to continue as a going concern.
- We have incurred significant losses since our inception and anticipate that we will incur continued losses in the future. We may never achieve or maintain profitability, and will likely require additional capital to fund our operations.
- Our failure to comply with the covenants or other terms of the A&R Note Purchase Agreement, including as a result of events beyond our control, could result in a default under the A&R Note Purchase Agreement that could materially and adversely affect the ongoing viability of our business.
- The A&R Note Purchase Agreement contains restrictions that limit our flexibility in operating our business.
- Provisions of the Pharmakon Senior Secured Notes and the 2022 Warrants could impede a sale of the Company.
- The 2022 Warrants contain anti-dilution provisions that may result in the reduction of their exercise prices in the future.
- The coronavirus (COVID-19) pandemic has and may continue to adversely affect our business, results of operations and financial condition.

Risks Related to Commercialization of XHANCE

- If we are unable to successfully commercialize XHANCE, our business, financial condition and results of operations may be materially adversely affected and the price of our common stock may decline.
- The commercial success of XHANCE will depend upon its acceptance by multiple stakeholders, including physicians, patients and healthcare payors.
- If third-party payors do not reimburse patients for XHANCE or if reimbursement levels are set too low for us to sell XHANCE at a profit, our ability to successfully commercialize XHANCE and our results of operations will be harmed.
- If we are unable to differentiate XHANCE from current and future products or existing methods of treatments, our ability to successfully commercialize XHANCE would be adversely affected.
- If the market opportunities for XHANCE are smaller than we believe, our revenue may be adversely affected.
- We rely on PPN partners for distribution of XHANCE in the U.S., and the failure of those PPN partners to distribute XHANCE effectively would adversely affect sales of XHANCE.
- If we cannot implement and maintain effective patient affordability programs or improve formulary access for XHANCE in the face of increasing pressure to reduce the price of medications, the adoption of XHANCE by physicians and patients may decline.
- If the U.S. Food and Drug Administration (FDA) or other applicable regulatory authorities approve generic or similar products that compete with XHANCE, or if the FDA or other applicable regulatory authorities change or create new pathways that may expedite approval of such products, it could decrease our expected sales of XHANCE.

- Even though we have obtained regulatory approval for XHANCE, we still face extensive FDA regulatory requirements and may face future regulatory difficulties.
- Our relationships with physicians, patients, payors and pharmacies in the U.S. are subject to applicable anti-kickback, fraud and abuse laws and regulations. Our failure to comply with these laws could expose us to criminal, civil and administrative sanctions, reputational harm, and could harm our results of operations and financial conditions.
- Regulatory approval for any approved product is limited by the FDA to those specific indications and conditions for which clinical safety and efficacy have been demonstrated.

Risks Related to Clinical Development and Regulatory Approval of XHANCE for the Treatment of Chronic Sinusitis and Our Other Product Candidates

- The design and execution of clinical trials to support FDA-approval of XHANCE for the treatment of chronic sinusitis is subject to substantial risk and uncertainty.
- The clinical development and regulatory approval processes of the FDA are lengthy, time consuming and inherently unpredictable, and if we are ultimately unable to obtain regulatory approval for our product candidates or maintain regulatory approval for our approved products, our business may be substantially harmed.

Risks Related to Our Reliance on Third Parties

- If we encounter difficulties in maintaining commercial manufacturing and supply agreements with our third-party manufacturers and suppliers of XHANCE or if we encounter issues with our contract manufacturers or suppliers, our ability to commercialize and manufacture XHANCE would be impaired.

Risks Related to Our Business Operations and Industry

- Our long-term growth depends on our ability to develop and commercialize additional ENT and allergy products.
- Our sales force and other employees, PPN partners, CMOs, CROs, principal investigators, collaborators, independent contractors, consultants and other vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

Risks Related to Our Intellectual Property

- If we are unable to protect our intellectual property rights or if our intellectual property rights are inadequate to protect our technology, XHANCE or our other product candidates, our competitors could develop and commercialize technology similar to ours, and our competitive position could be harmed.
- We may become involved in lawsuits to protect or enforce our patents or the patents of our licensors, which could be expensive, time consuming and unsuccessful.
- Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which could be uncertain and could harm our business.
- Our competitors may be able to circumvent our patents by developing similar or alternative technologies or products in a non-infringing manner.
- Changes in either U.S. or foreign patent law or interpretation of such laws could diminish the value of patents in general, thereby impairing our ability to protect our products.

Risks Related to Ownership of Our Common Stock

- The price of our common stock may be volatile and you may lose all or part of your investment.
- Future issuances of our common stock or rights to purchase common stock, including pursuant to our equity incentive plans, could result in additional dilution of the percentage ownership of our stockholders and could cause our stock price to fall.
- Some provisions of our charter documents and Delaware law may have anti-takeover effects that could discourage an acquisition of us by others.

MARKET, INDUSTRY AND OTHER DATA

This Annual Report on Form 10-K contains estimates, projections, market research and other information concerning our industry, our business, markets for XHANCE and the size of those markets, the prevalence of certain medical conditions, XHANCE market access, prescription data and other physician, patient and payor data. Unless otherwise expressly stated, we obtain this information from reports, research surveys, studies and similar data prepared by market research firms and other third parties, industry, medical and general publications, government data and similar sources as well as from our own internal estimates and research and from publications, research, surveys and studies conducted by third parties on our behalf. Information that is based on estimates, projections, market research or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances that are reflected in this information. As a result, you are cautioned not to give undue weight to such information.

PART I

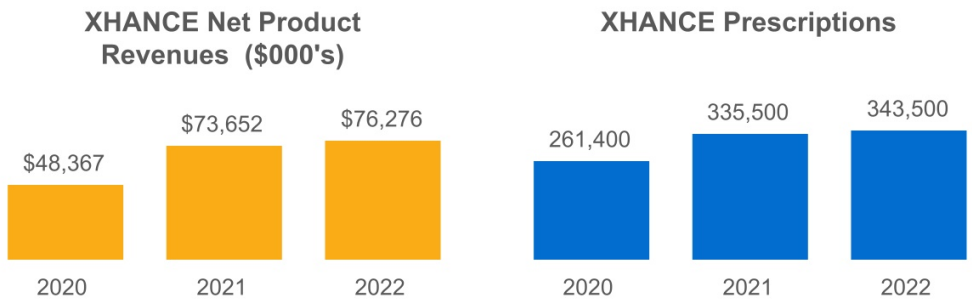
ITEM 1. BUSINESS

Overview

Our Company

We are a specialty pharmaceutical company focused on the development and commercialization of products for patients treated by ear, nose and throat (ENT) and allergy specialists. Our first commercial product, XHANCE® (fluticasone propionate) nasal spray, 93 microgram (mcg), is a therapeutic utilizing our proprietary Exhalation Delivery System™ (EDS®) that delivers a topically-acting corticosteroid for the treatment of chronic rhinosinusitis with nasal polyps and, if approved, chronic rhinosinusitis without nasal polyps (also known as chronic sinusitis). Chronic rhinosinusitis is a serious nasal inflammatory disease that is treated using therapies, such as intranasal steroids (INS), which have significant limitations. We believe XHANCE has a differentiated clinical profile with the potential to become part of the standard of care for this disease because it is able to deliver medication to the primary site of inflammation high and deep in the nasal passages in regions not adequately reached by conventional INS.

In September 2017, the U.S. Food and Drug Administration (FDA) approved XHANCE for the treatment of nasal polyps in patients 18 years of age or older. XHANCE was made widely available through commercial channels in April 2018.



We completed two Phase 3b clinical trials of XHANCE for a follow-on indication for the treatment of chronic sinusitis. Positive top-line results from the trials (which we refer to as ReOpen1 and ReOpen2) were announced in March and

June 2022, respectively. In September 2022, we met with FDA to discuss our planned supplemental new drug application (sNDA) for XHANCE as a treatment for adults with chronic sinusitis and submitted the application in February 2023. Assuming the FDA's acceptance of the sNDA submission and a standard review period, we expect the FDA's target action date to be in December 2023. If the sNDA is approved, XHANCE has the potential to be the first drug therapy approved by the FDA for the treatment of chronic sinusitis.

The Unmet Need

Chronic rhinosinusitis is a serious nasal inflammatory disease characterized by chronic inflammation affecting tissues high and deep in the nasal passages, including the area where the openings from the sinuses normally ventilate and drain. This disease significantly impacts the quality of life and daily functioning of an estimated 30 million adults in the U.S. The U.S. healthcare system spends approximately $60 billion annually in direct costs treating patients with chronic rhinosinusitis and its associated symptoms, including an estimated $5 billion on sinus surgeries. In the U.S., physicians perform over 500,000 sinus surgeries each year, and we estimate that as of 2017, over seven million adults had undergone sinus surgery to treat chronic rhinosinusitis with and without nasal polyps.

In medical literature and medical practice, chronic rhinosinusitis is commonly divided into two subgroups: chronic rhinosinusitis with nasal polyps and chronic rhinosinusitis without nasal polyps. Chronic rhinosinusitis patients with and without nasal polyps suffer from chronic inflammation of the lining of the deep nasal passages and sinuses. Patients with chronic rhinosinusitis with nasal polyps also develop non-cancerous polyps on these chronically inflamed surfaces, typically originating in the deep crevices or sinus cavities on both sides of the nose. We estimate that up to 10 million adults in the U.S. have chronic rhinosinusitis with nasal polyps.

Both subgroups of chronic rhinosinusitis share the same four defining diagnostic symptoms: nasal congestion/obstruction; facial pain and pressure; purulent runny nose and postnasal drip; and loss of sense of smell and taste. Additional symptoms may include headaches, chronic sleep problems, fatigue, frequent episodes of acute rhinosinusitis and mood disorders. There is evidence suggesting that the harm to a sufferer's quality of life from chronic rhinosinusitis, as measured in multiple domains, such as bodily pain, social functioning and mental health, is comparable to or worse than other serious diseases, including chronic obstructive pulmonary disease, congestive heart failure and angina. As a result, many patients eventually seek surgery for symptom relief.

Although the term chronic rhinosinusitis is often used in medical literature and medical practice, the FDA did not historically recognize chronic rhinosinusitis as an indication for drug development purposes. Instead, the FDA recognized chronic sinusitis and nasal polyps as indications for drug development purposes rather than the terminology chronic rhinosinusitis with or without nasal polyps. Recently, the FDA has approved drug products for the treatment of chronic rhinosinusitis with nasal polyps and issued a guidance document in November 2021 for clinical trial programs for nasal polyps in which it adopted the different terminology “treatment of chronic rhinosinusitis with nasal polyps” to replace the terminology “treatment of nasal polyps.” Subsequent to issuance of that guidance, FDA requested that previously approved labels for multiple drugs, including XHANCE, with an indication for “treatment of nasal polyps” be changed to reflect the new terminology, and accordingly the XHANCE indication was changed from “nasal polyps” to “chronic rhinosinusitis with nasal polyps.” This modification is the result of a change in terminology and was not based on new XHANCE clinical trial data. As a result of the FDA's evolving view on the terminology to be applied to what was historically labeled “chronic sinusitis” and “nasal polyps”, it is uncertain whether the phase 3 clinical trial program that we conducted for XHANCE will, if approved, result in an additional indication using the language “for the treatment of chronic sinusitis”, “for the treatment of chronic rhinosinusitis”, “for the treatment of chronic rhinosinusitis without nasal polyps”, or other similar language. It is our view that these variations in terminology are synonymous from a promotional perspective and that all are distinct from XHANCE's current indication. In this Annual Report on Form 10-K, we use the terms "chronic sinusitis" and "chronic rhinosinusitis without nasal polyps" as being synonymous.

Limitations of Therapies

Multiple clinical practice guidelines specify the use of INS early in the treatment algorithm for chronic rhinosinusitis with and without nasal polyps. Steroids are generally pharmacologically effective at treating inflammation. However, conventional INS, including nasal sprays and nasal aerosols, are topically-acting and unable to effectively and consistently place the steroids onto the primary site of inflammation and nasal polyp origin, high and deep in the nasal passages. These products deposit a majority of the drug in the front of the nose or on the floor of the nasal passages, reducing their effectiveness and leaving many patients without sufficient symptomatic relief. These recognized limitations cause some physicians to seek out alternative treatment regimens such as high-volume steroid nasal rinses. This approach, however, has not been well studied, is difficult to administer, can be costly and may risk systemic side effects. Physicians may also prescribe oral steroids on an episodic basis to patients who have not received sufficient symptomatic relief from INS. Oral steroids, which are often effective in reducing inflammation and nasal polyps, offer only temporary benefit and are limited by the risk of significant systemic side effects associated with both short- and long-term use. Additionally, in June 2019, December 2020, and July 2021, the FDA approved the first three monoclonal antibodies as add-on maintenance treatments (to an INS) in adult patients with inadequately controlled chronic rhinosinusitis with nasal polyposis, and other monoclonal antibodies are in development. The cost of currently approved monoclonal antibodies range from approximately $33,000 to $47,000 per year. We believe the high costs of these monoclonal antibodies, the need for subcutaneous injection or intravenous administration and the systemic nature of these treatments, which target components of the immune response, may limit the use by certain physicians and patients.

In cases where patients remain symptomatic despite medical management, physicians often recommend various forms of sinus surgery to help restore normal sinus ventilation or drainage. The effectiveness of sinus surgery can vary significantly, many patients experience persistent or recurrent symptoms, and surgery may not address the underlying cause of inflammation. In patients with nasal polyps, regrowth of the nasal polyps has been reported in as high as 60% of cases within four years. In addition, it has been reported that up to 80% of patients continue to have symptoms within two years of surgery. Because sinus surgery is often not curative and may not address the underlying cause of the inflammation, many patients continue to receive short- and long-term courses of INS after surgery.

Our Solution

XHANCE combines the EDS with a liquid formulation of fluticasone propionate, a well-characterized, second-generation corticosteroid. XHANCE is designed to deliver medication into the high and deep regions of the nasal passages where both nasal polyps and inflamed and swollen membranes can obstruct normal sinus ventilation and drainage. In multiple studies utilizing advanced imaging, the EDS produced a differentiated pattern of drug delivery in healthy subjects with significant drug deposited in the high and deep regions of the nasal passages, areas not well accessed by conventional INS delivery mechanisms. We believe XHANCE has the potential to become part of the standard of care for the treatment of patients with chronic rhinosinusitis before they progress to more costly treatment alternatives. We also believe that the current treatment practice of postoperative INS use could support XHANCE's adoption as a maintenance therapy to improve outcomes following sinus surgery.

To support FDA approval of XHANCE as a treatment for nasal polyps, we conducted five clinical trials evaluating over 1,500 adult patients, including two randomized, double-blinded, placebo-controlled Phase 3 pivotal clinical trials in adults with nasal polyps and two supportive open-label Phase 3 clinical trials in adults with symptoms of chronic sinusitis with or without nasal polyps. In both Phase 3 pivotal clinical trials, patients treated with XHANCE experienced statistically significant reductions of both nasal congestion/obstruction symptoms and total polyp grade, which were the co-primary endpoints. Treatment benefits were also observed in all four defining symptoms of chronic rhinosinusitis, as well as in polyp elimination (reduction of polyp to grade 0), quality of life measures, need for sinus surgery based on study-defined criteria and patient global impression of change. In addition, the magnitude of improvement for patients treated by XHANCE in our Phase 3 pivotal clinical trials, as measured by the Sinonasal Outcome Test-22, a validated clinical outcome assessment, was comparable to the reported benefits in third-party studies of endoscopic sinus surgery (ESS) and balloon sinus dilation. In our supportive open-label Phase 3 clinical trials, which evaluated approximately 900 patients with symptoms of chronic sinusitis with and without nasal polyps for a period of up to one year, XHANCE was generally well tolerated and produced results on efficacy measures similar to those observed in our Phase 3 pivotal clinical trials. In these supportive trials, we observed comparable symptom improvements in patients with and without nasal polyps and continuing incremental polyp reduction and symptom improvement through 12 months. XHANCE had an adverse event profile generally comparable to the profile reported in similarly designed trials with conventional INS. The most common adverse reactions (incidence ≥ 3%) are epistaxis, nasal septal ulceration, nasopharyngitis, nasal mucosal erythema, nasal mucosal ulcerations, nasal congestion, acute sinusitis, nasal septal erythema, headache, and pharyngitis.

We believe XHANCE offers a cost-effective treatment solution to payors who are increasingly being asked to pay for multiple high-cost therapies for a variety of diseases priced at tens of thousands of dollars per year. As of January 1, 2023, the wholesale acquisition cost for XHANCE was $596.97. XHANCE is priced significantly higher than low cost generic INS and over-the-counter (OTC) INS products.

We expect XHANCE to be adopted by physicians at a natural point in the care pathway for use in patients with chronic rhinosinusitis with or without nasal polyps after treatment failure with cheaper generic or OTC traditional INS therapies but before they progress to costly surgical interventions and monoclonal antibodies. We estimate that sinus surgery costs on average $13,500 per procedure, and monoclonal antibodies cost approximately $33,000 to $47,000 per year based on the wholesale acquisition cost and recommended dosing for XOLAIR™ (omalizumab), NUCALA™ (mepolizumab), and DUPIXENT™ (dupilumab).

U.S. Market Opportunity

We believe there is a market opportunity for XHANCE consisting of ENT physicians, allergists and primary care physicians in the U.S. that most frequently prescribe INS. This group of approximately 5,000 primary care physicians, which we refer to as "specialty-like" primary care physicians, account for approximately 25% of all INS prescriptions written by primary care physicians. We refer to these ENT physicians, allergists and high-decile INS-prescribing primary care physicians collectively as the "specialty segment" of our target market. We believe the approximately 15,000 physicians in this specialty segment together treat an estimated 3.5 million U.S. patients with chronic rhinosinusitis, an estimated 1.2 million of whom have chronic rhinosinusitis with nasal polyps. We believe the total annual U.S. market opportunity for XHANCE in this specialty segment is over $3.4 billion, of which approximately one-third consists of patients with chronic rhinosinusitis with nasal polyps. If we obtain approval for the follow-on indication of chronic sinusitis, we intend to broaden, through potential collaborations, our commercialization efforts to target additional primary care physicians that we believe treat an additional estimated 6.25 million U.S. patients with chronic rhinosinusitis, an estimated one-third of whom have chronic rhinosinusitis with nasal polyps. We refer to these additional primary care physicians as the "primary care segment" of our target market. We believe the total additional annual U.S. market opportunity for XHANCE in this primary care segment is over $6.0 billion, of which approximately one-third consists of patients with chronic rhinosinusitis with nasal polyps. Therefore, we estimate the total annual U.S. market opportunity for the combined specialty and primary care segments is over $9.5 billion, of which approximately one-third consists of patients with chronic rhinosinusitis with nasal polyps.

Intellectual Property and Barriers to Entry

XHANCE benefits from substantial intellectual property and other technical barriers to entry, including drug delivery complexities. Our XHANCE U.S. patent portfolio consists of 13 issued device and method of use patents expiring on various dates from 2023 through 2036 and three issued design patents expiring through 2030, as well as pending patent applications. The 13 issued device and method of use patents are published in the FDA's Approved Drug Products with Therapeutic Equivalence Evaluations, commonly known as the Orange Book.

We believe the unique features of the EDS, as well as its delivery of a topically-acting drug, will present generic and 505(b)(2) new drug application (NDA) competitors of XHANCE with technical and human factors engineering challenges specific to drug-device combination products and chemistry, manufacturing and controls challenges unique to suspension and respiratory products. We also believe that any future substitutable generic competitors may be required to conduct, among other things, non-inferiority clinical trials demonstrating equivalent efficacy and safety outcomes to establish clinical bioequivalence to XHANCE. We believe these clinical trials, if required, would necessitate a significant amount of time and capital investment and present clinical development uncertainties. However, XHANCE is referenced on the list of product specific guidances for complex generic drug products that the FDA plans to issue, which may provide clarity for generic competitors to develop generic products that compete with XHANCE.

Our Growth Strategy

Our goal is to become a leading specialty pharmaceutical company dedicated to developing proprietary products that become a part of the standard of care for diseases in the ENT and allergy segments. The key elements of our strategy are to:

- ***Continue to commercialize XHANCE in the ENT and allergy specialty segments in the U.S.*** We believe that approximately 15,000 targeted physicians treat an estimated 3.5 million chronic rhinosinusitis patients, an estimated 1.2 million of whom have chronic rhinosinusitis with nasal polyps. We have a sales

force of approximately 77 territory managers who target approximately 7,000 ENT and allergy specialists and "specialty-like" primary care physicians.

- ***Seek regulatory approval of XHANCE for the treatment of chronic sinusitis and expansion into the primary care segment to broaden our market opportunity.*** We completed two Phase 3b clinical trials in pursuit of a follow-on indication for XHANCE for the treatment of chronic sinusitis. We announced positive top-line results from these trials in March and June 2022 and believe XHANCE has the potential to be the first drug therapy approved by the FDA for the treatment of chronic sinusitis. In addition to increasing the number of patients for whom the product can be promoted within the currently targeted physician segment, we believe approval of the new indication by FDA could be a catalyst for us to enter into one or more collaborations to broaden the marketing of XHANCE to additional primary care physicians that we believe treat an additional estimated 6.25 million patients in the U.S. with chronic rhinosinusitis, an estimated two-thirds of whom have chronic sinusitis but do not have nasal polyps. In addition, at some point in the future, we, together with any potential partner secured for the primary care segment, intend to consider directing promotional resources to an additional estimated 20 million adult chronic rhinosinusitis sufferers who are not regularly under the care of physicians for this disease using programs such as direct-to-consumer and direct-to-patient promotion.
- ***Seek additional development candidates or approved therapies focused on the ENT and allergy specialty segments.*** We continue to evaluate strategic licensing, acquisition, development and commercial partnerships. These targeted opportunities could increase our growth and leverage our existing infrastructure and capabilities.
- ***Explore business development activities for the EDS outside of the ENT and allergy segments.*** We evaluate potential opportunities for additional uses of the EDS to support development and commercialization outside of ENT and allergy. We currently have two agreements in place that include an out-license of the EDS and related technology. In January 2019, OptiNose AS, our wholly-owned subsidiary, completed a licensing agreement with Inexia Limited (now Orexia Therapeutics, a subsidiary of Centessa Pharmaceuticals, a novel asset-centric pharmaceutical company) (the Centessa License Agreement). Pursuant to the terms of the Centessa License Agreement, we granted Orexia an exclusive license to the EDS and related intellectual property for the research, development and commercialization of products containing orexin receptor agonist and/or orexin receptor positive modulator molecules. In September 2019, OptiNose AS, entered into a licensing agreement (Currax License Agreement) with Currax Pharmaceuticals LLC (Currax) whereby we granted Currax an exclusive license to certain OptiNose patents and a non-exclusive license to certain OptiNose know-how related to Onzetra® Xsail® (sumatriptan nasal powder) in the U.S., Canada and Mexico.
- ***Expand XHANCE into international markets.*** We intend to remain opportunistic in pursuit of select international opportunities in order to maximize the commercial potential and the availability of XHANCE to patients.

Chronic Rhinosinusitis and Market Opportunity

Chronic Rhinosinusitis

Chronic rhinosinusitis (CRS) is a serious nasal inflammatory disease significantly impacting patients' quality of life and daily functioning. CRS, unlike allergic rhinitis, is characterized by chronic inflammation affecting tissues high and deep in the nasal passages, including the area where the openings from the sinuses normally ventilate and drain, causing symptoms that persist for a period of 8 to 12 weeks or longer. CRS patients typically suffer from these symptoms four to six months a year, with symptoms often persisting for many years.

In medical literature and medical practice, CRS is commonly divided into two subgroups: CRS with nasal polyps (CRSwNP) and CRS without nasal polyps (CRSsNP). CRS patients with and without nasal polyps suffer from chronic inflammation of the lining of the deep nasal passages and sinuses. Patients with CRSwNP also develop non-cancerous polyps on these chronically inflamed surfaces, typically originating in the deep crevices or sinus cavities on both sides of the nose. We estimate that up to 10 million adults in the U.S. have CRSwNP. Both subgroups of CRS share the same four defining diagnostic symptoms: (1) nasal congestion/obstruction; (2) facial pain and pressure; (3) purulent runny nose, and postnasal drip; and (4) loss of sense of smell and taste. Additional symptoms may include headaches, chronic sleep problems, fatigue, frequent episodes of acute rhinosinusitis and mood disorders. There is evidence suggesting that the harm to a sufferer's quality of life from CRS, as measured in multiple domains, such as bodily pain, social functioning and mental health, is comparable to or worse than other

serious diseases, including chronic obstructive pulmonary disease, congestive heart failure and angina. As a result, many patients eventually seek surgery for symptom relief.

The American Academy of Otolaryngology-Head and Neck Surgery estimates that approximately 30 million adults in the U.S. have CRS, and it is estimated that up to 10 million adults have CRSwNP. CRS imposes a significant healthcare burden on insurers and employers. It has been reported that the U.S. healthcare system spends approximately $60 billion annually in direct costs treating patients with CRS and its associated symptoms, including an estimated $5 billion on sinus surgeries. In the U.S., physicians perform over 500,000 sinus surgeries each year, and we estimate that as of 2017, over seven million adults had undergone sinus surgery to treat CRS with and without nasal polyps. CRS has been reported to account for an aggregate of 73 million restricted activity days per year. Additionally, people with CRS have been reported to be absent from work because of this disease 6.5% of the time and to suffer a 38% loss of productivity.

U.S. Market Opportunity

We estimate that approximately 9.75 million CRS patients are currently being treated in physician offices in the U.S. We derived this estimate from a large patient claims database that reflects actual treatment patterns of CRS over a two-year period from 2010 to 2012. We also estimate that approximately 10,000 ENT and allergy specialists, as well as approximately 5,000 "specialty-like" primary care physicians, treat approximately 36% of all CRS patients in the U.S., or approximately 3.5 million patients, an estimated 1.2 million of whom have CRSwNP. In accordance with multiple published clinical practice guidelines, physicians typically medically manage CRS patients by prescribing INS despite the fact that there are no FDA-approved products for the treatment of CRSsNP.

If we obtain FDA approval for the follow-on indication for the treatment of chronic sinusitis (CS), we intend to broaden, through potential collaborations, our marketing outreach to additional primary care physicians that treat an additional estimated 6.25 million U.S. patients with CRS, an estimated one-third of whom have CRSwNP. We expect to execute this expansion primarily through one or more collaborations with third parties that already have a sales force calling on primary care physicians. We may also direct promotional resources to an additional estimated 20 million CRS sufferers who are not regularly under the care of physicians for this disease using programs such as direct-to-consumer and direct-to-patient promotion.

Based on internal estimates, we believe the total annual U.S. market opportunity for XHANCE in the specialty segment is over $3.4 billion, of which approximately one-third consists of patients with CRSwNP. Based on these same estimates, we believe the total additional annual U.S. market opportunity for XHANCE in the primary care segment is over $6.0 billion, of which approximately one-third consists of patients with CRSwNP. Therefore, we estimate the total annual U.S. market opportunity for the combined specialty and primary care segments is over $9.5 billion, of which approximately one-third consists of patients with CRSwNP.

Treatment Landscape

The treatment of CRS with and without nasal polyps typically begins with medical management. In cases where patients remain symptomatic despite medical management, physicians often recommend various forms of sinus surgery to help restore normal sinus ventilation and drainage. The following is a brief description of the current treatment landscape and product candidates in development for CRS with and without nasal polyps:

Current Therapies

- ***Intranasal Steroids.*** Multiple published clinical practice guidelines generally recommend topically-acting INS as the first line of prescription therapy for the treatment of CRS with and without polyps. As a result, physicians typically prescribe INS nasal sprays or nasal aerosols despite the fact that there are no FDA-approved products for the treatment of CRSsNP. Therefore, the majority of chronic rhinosinusitis sufferers being treated have tried INS. We estimate that physicians in the U.S. prescribe approximately 17 million INS prescriptions each year for the treatment of chronic rhinosinusitis, which includes, among other INS products, a generic fluticasone propionate nasal spray. The only other branded INS to receive an indication for the treatment of nasal polyps is Nasonex™, which was marketed by Merck & Co., Inc. before being removed from the prescription market but is available over-the-counter without a prescription for other indications. Generic versions of Nasonex™, mometasone furoate monohydrate, remain available as prescription drugs. Physicians not only prescribe INS as a standalone therapy, but also typically prescribe INS following sinus surgery as some third-party clinical trials suggest that INS treatment can improve symptoms and delay symptom recurrence. In lieu of prescription INS nasal sprays, physicians may recommend use of over-the-counter INS nasal sprays including over-the-counter products containing fluticasone propionate and mometasone furoate monohydrate.

- ***Oral steroids.*** Physicians may prescribe oral steroids on an episodic basis to patients who have not received sufficient symptomatic relief from INS. Oral steroids are often effective at treating the underlying inflammation associated with the disease and reducing postoperative scarring, but the benefit is temporary. As inflammation returns, many patients resume INS therapy.
- ***Monoclonal antibodies.*** In June 2019, the FDA approved DUPIXENT™ as an add-on (to an INS) maintenance treatment in adult patients with inadequately controlled chronic rhinosinusitis with nasal polyposis. In November 2020, the FDA approved XOLAIR™ add-on maintenance treatment of nasal polyps in adult patients with inadequate response to nasal corticosteroids. In July 2021, the FDA approved NUCALA™ add-on maintenance treatment of chronic rhinosinusitis with nasal polyps in adult patients with inadequate response to nasal corticosteroids. In addition, these monoclonal antibodies are being, or are expected to be, studied as potential treatments for patients with chronic rhinosinusitis without nasal polyps.
- ***Other medical management.*** Physicians commonly employ a variety of other non-surgical treatments in the medical management of chronic rhinosinusitis, including nasal saline rinses, multi-week courses of antibiotics, leukotriene antagonists, decongestants, aspirin desensitization and antifungals. The recognized limitations of drug deposition with current INS cause some physicians to seek out alternative treatment regimens, such as high doses of locally compounded liquid budesonide in high-volume nasal rinses. Chronic rhinosinusitis is one of the most common reasons for adult outpatient antibiotic use in the U.S., comprised of approximately 37 million prescriptions per year.
- ***Sinus surgery and other procedures.*** Physicians generally recommend surgical treatment of chronic rhinosinusitis with and without nasal polyps only after patients fail medical management. The primary surgical alternative is Endoscopic Sinus Surgery (ESS), which attempts to open the sinus drainage pathways while preserving as much bone and sinus tissue lining as possible. The physician typically uses rigid steel instruments and powered cutting tools to remove inflamed tissue, including any nasal polyps, and underlying bone and cartilage to create a larger passage through the nasal anatomy to the sinuses. At the conclusion of the procedure, patients often have their nasal passages packed with a material that acts as a spacer to prevent surgical adhesions and control bleeding. Patients typically require one or more follow-up debridement treatments in which the physician may remove more tissue, crusting, scabs or scar tissue at the area of surgery in order to keep the sinus drainage pathway open and promote proper healing.

  Several companies have developed less invasive technologies for the treatment of chronic rhinosinusitis since the introduction of ESS, such as balloon sinus dilation devices and steroid-releasing sinus implants. Balloon sinus dilation employs a high pressure inflated balloon to open blocked sinus pathways to increase ventilation and mucus drainage. Steroid-releasing sinus implants are used to hold open the surgically enlarged sinus, while releasing a steroid over a period of time in order to reduce postoperative sinus inflammation and scarring. SINUVA® (mometasone furoate) sinus implant is a commercially available corticosteroid-eluting implant indicated for the treatment of nasal polyps in adult patients who have had ethmoid sinus surgery that can be placed in the ethmoid sinus under endoscopic visualization for up to 90 days. In the SINUVA clinical studies, patients were advised to use nasal steroid sprays and sinus rinses for the duration of the study.

Potential Future Therapies

Additional potential future therapies include but are not limited to monoclonal antibodies, and corticosteroid-eluting implants. Benralizumab, which is already approved for other indications, is being developed for the treatment of nasal polyps, and is believed to inhibit specific pathways of inflammation present in nasal polyps. Lyra Therapeutics is developing corticosteroid-eluting implants as potential treatment for patients with chronic rhinosinusitis.

Limitations of Therapies

The current and potential future therapies to treat patients suffering from chronic rhinosinusitis with and without nasal polyps have a number of limitations, including:

- ***Limited efficacy of INS treatments using traditional nasal sprays and nasal aerosols.*** Although steroids are generally pharmacologically effective, conventional INS, including nasal sprays and nasal aerosols, are unable to effectively and consistently place the steroids onto the primary site of inflammation and nasal polyp origin, high and deep in the nasal passages. These products deposit a majority of the drug in the front of the nose or on the floor of the nasal passages, reducing their effectiveness and leaving many patients without sufficient symptomatic relief.

- ***Short-term benefits of oral steroids outweighed by significant side effects.*** Oral steroids offer only temporary benefit and are limited by the risk of significant systemic side effects associated with both short- and long-term use. These side effects include, among others, weight gain; increased risk of infections; loss of bone mineral density; death of bone tissue; cataract formation; glaucoma; adrenal suppression; and psychiatric complications, including mania, depression, and psychosis.
- ***Varying degrees of efficacy with other medical management.*** Other non-surgical treatments have varying degrees of supporting data and efficacy. In addition, high-volume steroid nasal rinses are difficult to administer, can be costly, may risk systemic side effects due to the absorption of the steroid into the body, can be associated with fluid draining from the nose after the procedure and are difficult for patients to comply with over prolonged courses of outpatient therapy.
- ***Sinus surgery and other procedures are costly and may not be a complete solution.*** The effectiveness of sinus surgery varies significantly and many patients experience persistent or recurrent symptoms. Reports indicate that nasal polyp regrowth following surgery occurs in as high as 60% of cases within four years. In addition, it has been reported that up to 80% of patients continued to have symptoms within two years of surgery. Because sinus surgery is often not curative and may not address the underlying cause of the inflammation, many patients receive short- and long-term courses of INS after surgery and approximately 20% of patients elect surgical revisions. Postoperative scarring and persistent inflammation are common and can compromise symptom outcomes and also negatively impact the ability of the sinuses to heal. Sinus surgery is also a costly procedure, with estimated costs on average $13,500 per procedure. While balloon sinus dilation has the ability to open sinuses in a less invasive manner, it also may not address the underlying cause of the inflammation associated with chronic rhinosinusitis and is costly. Similarly, steroid-releasing sinus implants have limited duration of anti-inflammatory effect, are costly and face reimbursement challenges.
- ***Treatment with monoclonal antibodies is costly, difficult to administer and may have negative side effects.*** The current FDA-approved monoclonal antibodies for the treatment of nasal polyps cost approximately $33,000 to $47,000 per year. Monoclonal antibodies also require subcutaneous injections or intravenous administration. We believe the systemic nature of these treatments, which target components of the immune response, may result in more adverse side effects than treatments with topically-acting steroids.

Our Solution

XHANCE

XHANCE combines the EDS with a liquid formulation of fluticasone propionate, a potent, well-characterized, second-generation anti-inflammatory corticosteroid for the treatment of serious nasal diseases characterized by chronic inflammation, such as chronic rhinosinusitis. XHANCE is designed to deliver fluticasone propionate into the high and deep regions of the nasal passages where nasal polyps or inflamed and swollen membranes can obstruct normal sinus ventilation and drainage.

In September 2017, the FDA approved our NDA for XHANCE for the treatment of nasal polyps in patients 18 years of age or older. In January 2023, the indication statement for XHANCE was changed from “for the treatment of nasal polyps” to “for the treatment of chronic rhinosinusitis with nasal polyps” to reflect current FDA labeling terminology and not based on new XHANCE clinical data.

In March and June 2022, we announced positive top line results from our two Phase 3b clinical trials in of XHANCE for a follow-on indication for the treatment of chronic sinusitis. In February 2023, we submitted a prior approval efficacy supplement (sNDA) to support the approval of a new indication for XHANCE for the treatment of chronic sinusitis. Assuming the FDA's acceptance of the sNDA submission and a standard review period, we expect the FDA's target action date to be in December 2023. If the sNDA is approved, XHANCE has the potential to be the first drug therapy approved by the FDA for the treatment of chronic sinusitis.

We believe XHANCE could become a part of the standard of care for the treatment of patients with chronic rhinosinusitis with and without nasal polyps before they progress to more costly treatment alternatives and could also be adopted as a maintenance therapy to improve outcomes following sinus surgery.

The Exhalation Delivery System (EDS)

The EDS enables the development of drug-device combination products intended for self-administration. We have developed both a liquid delivery EDS and a powder delivery EDS utilizing natural functional behaviors of the upper

nasal airways intended to offer better drug deposition. The EDS is designed to overcome many limitations inherent in conventional nasal spray and nasal aerosol delivery systems, most notably, enabling higher and deeper intranasal drug delivery.

Liquid Exhalation Delivery System

The liquid EDS depicted below, which is the EDS used in XHANCE, consists of the primary drug container for the liquid drug formulation, an amber glass vial sealed by a crimp-fitted metering spray pump, enclosed within a proprietary liquid delivery subassembly. The nasal spray applicator, which is a component of the subassembly, is attached to the pump and extends to the top of the nosepiece of the liquid delivery subassembly. The EDS includes a flexible mouthpiece and an asymmetrically-shaped nosepiece, covered by an orange cap, as part of a mechanism that uses the patient's exhaled breath to naturally seal closed the soft palate and to facilitate delivery of drug to the nasal passages through the sealing nosepiece. The nosepiece is designed to create a seal with the nostril and also to expand and stent the upper part of the nasal valve, which is an important anatomical structure that is the narrowest part of the entire respiratory tract and a barrier that causes most medication delivered by conventional INS to deposit in the front part of the nose.

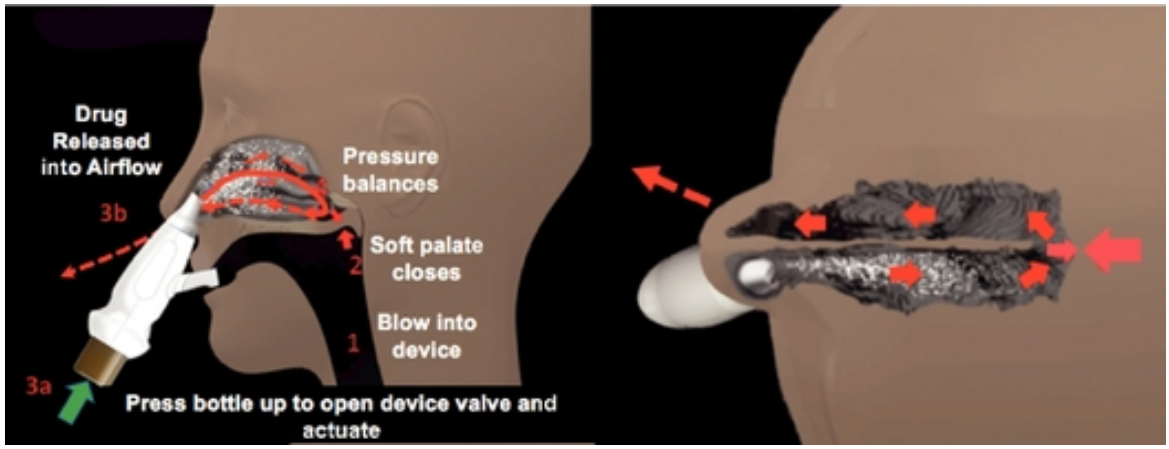
Powder Exhalation Delivery System

The powder EDS depicted below, which is the EDS used in Onzetra® Xsail®, consists of a reusable device body incorporating a flexible mouthpiece to adjust to individual anatomic variations, and a white button piercing assembly to pierce the medication capsule. Disposable nosepieces are provided in a foil pouch to be inserted into the drug delivery device body. Each pre-filled nosepiece section contains a medication capsule containing a dry powder formulation and a clear release tab. The capsule is pierced by pressing and releasing the white button piercing assembly. The flexible mouthpiece and an asymmetrically-shaped nosepiece are part of the mechanism that uses the patient's exhaled breath to naturally seal closed the soft palate and to facilitate delivery of drug to the nasal passages through the sealing nosepiece. The medication capsule is intended for single dose administration and is not refillable or removable from the nosepiece.

Following drug administration, the disposable nosepiece, including the dose-expended medication capsule, is then removed and discarded.

How the Exhalation Delivery System (EDS) works

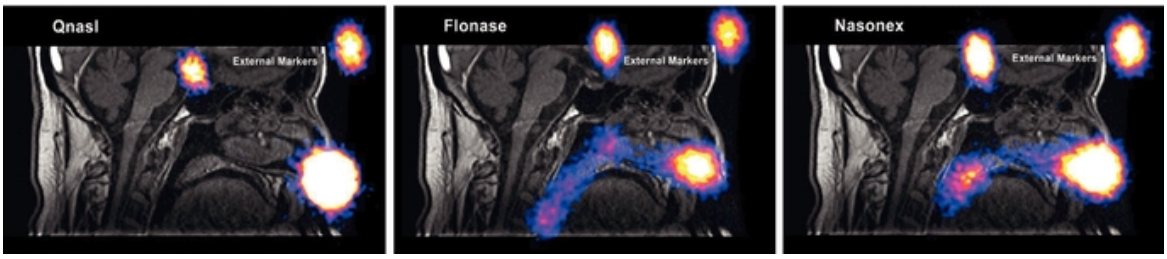
When exhaling into the EDS, the soft palate automatically elevates and creates an air-tight seal separating the nasal cavity from the throat and lungs. This natural action is the same as that which prevents air from escaping from the nose when trying to blow up a balloon or blow a trumpet. The exhaled air is then routed through the EDS which introduces medication into the air flow and then directs the air and medication through the sealing nosepiece. The positive air pressure, which is the opposite of the negative pressure produced by sniffing with ordinary nasal sprays, acts to dynamically expand the nasal valve and the narrowed nasal passages, helping to deliver the drug around obstructing anatomic barriers and fill one side of the nasal cavity. This enables high and deep deposition of medication in the nasal passages. The positive air pressure, proportional to the pressure on the other side of the soft palate, helps to open a passage between the two sides of the nasal cavity, behind the back edge of the nasal septum. The picture below illustrates this action, which allows the exhaled air pressure to escape from the opposite nostril.



The drug delivery mechanism of the EDS is designed to overcome the drug deposition shortcomings of conventional nasal sprays and nasal aerosols. In conventional nasal sprays and nasal aerosols, the medication is inhaled or sniffed into the nose creating negative pressure within the nasal passages, which does not facilitate the

expansion of the nasal valve or the nasal passages and may obstruct the drug from reaching deep into the nose where most nasal polyps and inflamed and swollen sinus membranes exist.

The pattern of drug deposition produced by conventional nasal sprays and the EDS has been evaluated in multiple studies using a combination of advanced imaging modalities to depict the regions of the nasal passages where drug is deposited after administration in healthy human volunteers. In an open label, crossover study conducted by a third party in nine patients with allergic rhinitis, investigators examined the nasal deposition of radio-labeled materials that allow for traceability following use of Qnasl™ (HFA-beclomethasone, nasal aerosol), Flonase™ (fluticasone propionate, nasal spray) and Nasonex™ (mometasone furoate monohydrate, nasal spray). In this study, gamma cameras were used to capture emitted radiation from these tracers to create two-dimensional images in a similar process to the capture of x-ray images. These gamma images were merged with magnetic resonance images (MRI) to quantify regional deposition within the nasal passages. The images below illustrate how the pattern of drug deposition in the nasal passages produced by Qnasl™, Flonase™ and Nasonex™ was concentrated in the front and lower regions of the nasal passages, as opposed to the high and deep regions of the nasal passages targeted in the treatment of CRS.



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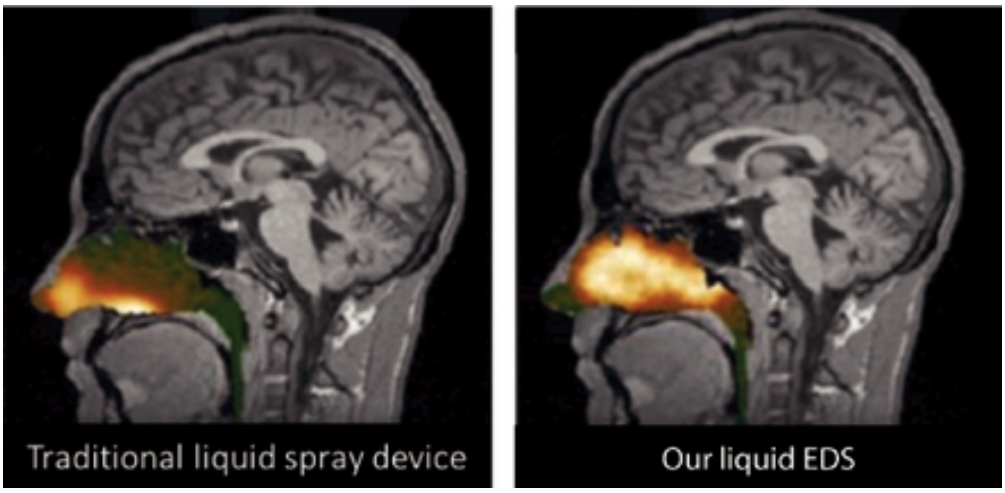
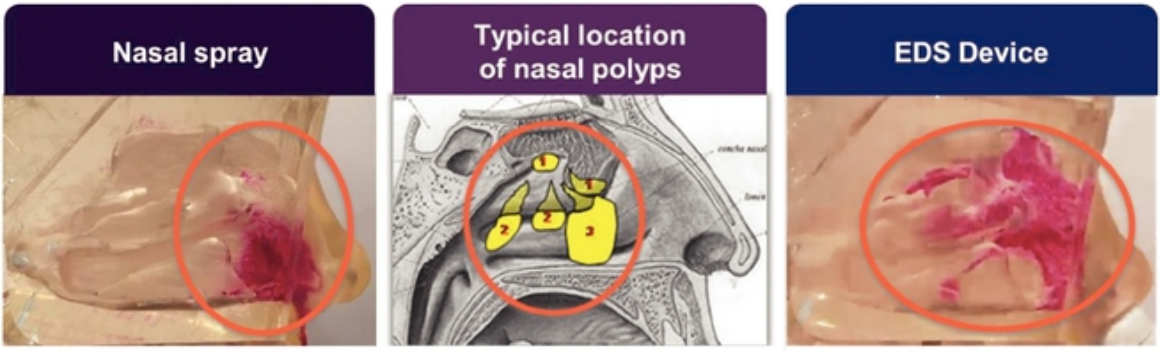
We conducted six deposition studies evaluating 53 healthy subjects that produced approximately 250 images. As depicted in the representative figures below, the EDS produced a differentiated pattern of drug delivery with significantly more drug deposited in the high and deep regions of the nasal passages.



The pictures above use gamma camera image information, which was then superimposed on the corresponding MRI section. These images represent deposition in healthy subjects two minutes after delivery using a traditional liquid nasal spray and a version of the liquid EDS. Deposition with traditional liquid nasal spray was greatest in the front parts of the nose, whereas deposition with the EDS was greatest in the high and deep regions of the nose.

The pictures below illustrate how the liquid EDS (with exhalation) places medication higher and deeper in the nasal passages than a conventional nasal spray (without sniffing) in nasal cast models. As depicted below, although conventional nasal spray systems can reach, and therefore treat, large nasal polyps, they are not generally suitable

for reaching nasal polyps or inflammation in the higher and deeper regions where obstruction of the sinus openings occurs.



The liquid EDS is also designed to address user dissatisfaction with conventional nasal delivery by reducing drug drip-out from the front and back of the nose and the bad taste that often accompanies drug entering the throat. By reducing the loss of drug to non-targeted sites, such as the gastrointestinal tract by swallowing, or lungs, the EDS has the potential to improve the efficiency of drug activity and to improve tolerability by reducing off-target effects.

Our Pipeline

XHANCE for Chronic Sinusitis

In addition to XHANCE's existing indication for the treatment of nasal polyps, in order to broaden our U.S. market opportunity, we conducted a clinical trial program in pursuit of a follow-on indication for the treatment of CS in the U.S. We announced positive top-line results from the clinical trials in March and June 2022 and submitted a supplemental new drug application (sNDA) in February 2023. Assuming the FDA's acceptance of the sNDA submission and a standard review period, we expect the FDA's target action date to be in December 2023. If the sNDA is approved, XHANCE has the potential to be the first drug therapy approved by the FDA for the treatment of chronic sinusitis.

In the future, as appropriate, we intend to broaden, through potential collaborations, our commercialization efforts to additional primary care physicians that we believe treat an additional estimated 6.25 million U.S. patients with chronic rhinosinusitis, an estimated one-third of whom have chronic rhinosinusitis with nasal polyps. In addition, at some point in the future, we intend to consider, with a collaboration partner, directing promotional resources to an additional estimated 20 million adults who are not regularly under the care of physicians for this disease using programs such as direct-to-consumer and direct-to-patient promotion.

EDS Technology

We opportunistically evaluate opportunities to develop product candidates using the EDS and related technologies for indications and markets outside of our ENT and allergy focus through business development and partnering activities.Although our current focus is to prioritize the successful commercialization of XHANCE for the ENT and allergy specialty segment and the pursuit of FDA approval of XHANCE for the treatment of chronic sinusitis, we may apply or out-license the EDS and related technology to other product candidates across a broad range of disease areas. For example, by placing drug high and deep in the nose, in regions where cranial nerves connect directly with the brain, we believe it may be possible to deliver medications directly into the brain and avoid the difficulties of getting drug past the blood-brain barrier. This may enable treatment of brain diseases using small or large molecules that otherwise do not readily enter the nervous system.

Sales and Marketing

We have established a commercial infrastructure designed to drive adoption and sales of XHANCE with healthcare professionals who treat patients with nasal polyps. We believe that approximately 15,000 physicians treat an estimated 3.5 million chronic rhinosinusitis patients, an estimated 1.2 million of whom have chronic rhinosinusitis with nasal polyps.

Customer Model. At the start of 2022 we had a sales force of approximately 90 territory managers who targeted over 10,000 ENTs, allergists and "specialty-like" primary care physicians. At the end of 2022 we had reduced the size of our sales force to approximately 77 territory managers, as part of actions intended to reduce our operating expenses, who target approximately 7,000 ENTs, allergists and "specialty-like" primary care physicians. In addition

to in-person promotion by our territory managers we target additional physicians through digital and non-personal promotion in areas where we do and do not have territory managers.

Our sales team is equipped with educational materials demonstrating the benefit and safety profile of XHANCE. In the future, particularly after receipt of a potential future new indication for the treatment of chronic sinusitis, we may increase the number of geographic territories as well as hire additional territory managers in order to increase the number of called-on target physicians and frequency of calls. We believe that in the long term, direct to consumer (DTC) advertising could be an effective way to increase XHANCE prescription growth.

XHANCE Co-Pay Savings Program. We believe our co-pay savings program provides an affordability solution for patients that physicians will support. This program provides patient co-pay assistance to eligible commercially insured patients. These patients may obtain XHANCE for as little as $0 out-of-pocket.

Market Access. Based on currently available third-party data and our internal analyses as of December 31, 2022, we believe that approximately 80% of commercially insured lives are currently in a plan that covers XHANCE. However, payors may change coverage levels for XHANCE, positively or negatively, at any time. Additionally, payors generally impose restrictions on access to or usage of XHANCE, such as by requiring prior authorizations or "step-edits". For example, insurers may require that a physician attest that they are treating a patient for an approved indication prior to becoming eligible for coverage for XHANCE. Approximately half of the commercially covered lives as of December 31, 2022 are in a plan that requires a prior authorization and most of those prior authorizations request information regarding prior use of INS and patient diagnosis. In some cases, patients do not meet the payors' utilization management criteria, and in other cases, healthcare providers may not complete the administrative process required to demonstrate or document that the patients for whom XHANCE has been prescribed meet the payors' utilization management criteria (i.e., prior authorizations or step-edits) and, as a result, patients may not gain access to XHANCE treatment. In our contract negotiations with payors we seek to balance patient access and affordability, breadth of coverage, payor utilization management and rebates levels. We have also contracted with the Centers for Medicare and Medicaid Services for coverage of certain government insured lives and continue to expand XHANCE market access for other government-insured populations.

Trade and Distribution. We currently sell XHANCE primarily to PPN partners. We established this channel to offer patients the option of filling prescriptions through a network of preferred pharmacies that may be able to better serve the needs of patients through services including delivery of XHANCE by mail and performing certain patient services such as patient insurance benefit verification. We also sell XHANCE to wholesale pharmaceutical distributors, who, in turn, sell XHANCE to retail pharmacies, hospitals and other customers. We have contracted with a third-party logistics provider for key services related to logistics, warehousing and inventory management, and distribution. Further, our third-party logistics provider provides customer order fulfillment services and accounts receivable management.

Customers

Approximately 81% of our XHANCE net revenues during the fiscal year ended December 31, 2022 were to PPN partners. The three leading PPNs accounted for approximately 22% of our XHANCE net revenues. Additionally, approximately 19% of our XHANCE net revenues during the fiscal year ended December 31, 2022 were to the three largest wholesale pharmaceutical distributors, Cardinal Health, McKesson Corporation, and AmerisourceBergen Drug Corporation.

Manufacturing

We contract with third parties for the manufacture, testing and storage of XHANCE. In our experience, contract manufacturers (CMOs) are generally cost-efficient and reliable and therefore we currently have no plans to build our own manufacturing capabilities. Because we rely on CMOs, we employ personnel with extensive technical, manufacturing, analytical and quality experience to oversee contract manufacturing and testing activities, and to compile manufacturing and quality information for our regulatory submissions. Manufacturing is subject to extensive regulations that impose various procedural and documentation requirements, and which govern record-keeping, manufacturing processes and controls, personnel, quality control and quality assurance, among other activities. Our systems and our contractors are required to comply with these regulations, and we assess this compliance regularly through monitoring of performance and a formal audit program.

We have entered into the following key supply agreements for the commercial manufacture and supply of XHANCE:

- A supply agreement with Hovione Inter Ltd for the supply of fluticasone propionate, the active pharmaceutical ingredient included in the liquid suspension formulation. This agreement terminates in

March 2023, although we are currently in discussions to enter into an extension of the term. We have also been actively pursuing a second source for supply that we anticipate will be online in early 2024. In the event we cannot reach an agreement on an extension, we have existing materials on hand to support production through 2023, and the ability to spot purchase to bridge to a new supplier.

- A manufacture and supply agreement with Contract Pharmaceuticals Limited Canada (CPL) for the formulation and assembly of the finished drug product during the fill/pack operation. This agreement was amended and renewed in February 2021 and now terminates on December 31, 2024, subject to earlier termination or extension in accordance with the terms of the agreement.
- A manufacturing services agreement with Advance Mold & Manufacturing, Inc. for the manufacture of the liquid delivery sub-assembly, which consists of injection molded parts and other purchased components. The agreement expires in October 2023 (subject to earlier termination or extension in accordance with its terms) but will automatically renew for successive one-year terms unless either party provides at least ninety days prior written notice to the other that it does not intend to renew the agreement.

We believe our third-party manufacturers have adequate capacity to manufacture sufficient quantities of XHANCE to meet anticipated commercial demands and we are pursuing opportunities to decrease our reliance on sole-source suppliers and increase the third party manufacturing capacity that is available to us. We have initiated the process of qualifying alternate third party suppliers for select components of XHANCE. Alternate third party suppliers of XHANCE components are subject to qualification and approval from the FDA.

Competition

Our industry is highly competitive and subject to rapid and significant technological change as research provides a deeper understanding of the pathology of diseases and new technologies and treatments are developed. We believe our scientific knowledge, technology, and development capabilities provide us with substantial competitive advantages, but we face potential competition from multiple sources, including large pharmaceutical, biotechnology, specialty pharmaceutical and, to a lesser degree, medical device companies.

XHANCE competes primarily with INS, oral steroids, monoclonal antibodies and other medical management products, including locally compounded liquid budesonide in high-volume nasal rinses. XHANCE also competes with surgical procedures, balloon sinus dilation products and steroid-releasing sinus implants. Key competitive factors affecting the commercial success of XHANCE and any other product candidates we may develop are likely to be efficacy, safety and tolerability profile, reliability, convenience of administration, price and reimbursement.

The only other branded INS to receive an indication for the treatment of nasal polyps is Nasonex™, which was marketed by Merck & Co., Inc. before being removed from the prescription market but is available over-the-counter without a prescription for other treatment indications. Generic versions of Nasonex™, mometasone furoate monohydrate, were first approved by the FDA for, among other indications, the treatment of nasal polyps and launched in 2016 and remain available by prescription. Also, Beconase AQ™, which is an INS marketed by GlaxoSmithKline, is indicated for the prophylaxis of nasal polyps after surgical resection. In addition, SINUVA™ is a commercially available corticosteroid-eluting implant indicated for the treatment of nasal polyps in adult patients who have had ethmoid sinus surgery that can be placed in the ethmoid sinus under endoscopic visualization for up to 90 days. In the SINUVA™ clinical studies, patients were advised to use INS and sinus rinses for the duration of the study. Also, Lyra Therapeutics is developing corticosteroid-eluting implants as potential treatment for patients with chronic rhinosinusitis.

There are no products approved for the treatment of chronic sinusitis without nasal polyps. There are two categories of INS: first-generation INS products, which include Rhinocort™, Nasacort AQ™ and Qnasl™; and second-generation INS products, which include Flonase™, Veramyst™, Omnaris™ and Zetonna™. The primary difference between first- and second-generation INS products is that first-generation INS are absorbed into the blood to a greater extent than second-generation INS, with systemic bioavailability ranging from 10% to 50% compared to a systemic bioavailability with fluticasone propionate, a second-generation INS, of less than 2%. Many of the most widely-prescribed INS products are available in generic form and some, such as Flonase™ (which contains fluticasone propionate the same active pharmaceutical ingredient as XHANCE), Nasonex (which contains mometasone furoate monohydrate) and other products containing fluticasone propionate and mometasone furoate monohydrate, are available over-the-counter without a prescription at prices generally ranging from approximately $15-30 per month supply.

Several companies have developed or are currently developing monoclonal antibodies for the treatment of nasal polyps. These monoclonal antibodies, which inhibit specific pathways of inflammation present in nasal polyps, include benralizumab, DUPIXENT™, XOLAIR™, and NUCALA™. In June 2019, the FDA approved DUPIXENT™ as an add-on (to an INS) maintenance treatment in adult patients with inadequately controlled chronic rhinosinusitis with nasal polyposis. In November 2020, the FDA approved XOLAIR™ as an add-on maintenance treatment of nasal polyps in adult patients with inadequate response to nasal corticosteroids. In July 2021, the FDA approved NUCALA™ as an add-on maintenance treatment of chronic rhinosinusitis with nasal polyps in adult patients with inadequate response to nasal corticosteroids. In addition these monoclonal antibodies are being, or are expected to be, studied as potential treatments for patients with chronic rhinosinusitis without nasal polyps. Monoclonal antibodies could represent significant competition for XHANCE.

Seasonality

A seasonal effect has historically been observed in the INS prescription market in which market volume generally peaks near the middle of the second quarter and declines into the early part of the third quarter of each calendar year. Based on third-party prescription data, INS market prescriptions decreased 4% from the fourth quarter of 2020 to the first quarter of 2021, increased 14% from the first quarter of 2021 to the second quarter of 2021, decreased 4% from the second quarter of 2021 to the third quarter of 2021, increased 1% from the third quarter of 2021 to the fourth quarter of 2021, were flat from the fourth quarter of 2021 to the first quarter of 2022, increased 7% from the first quarter of 2022 to the second quarter of 2022, decreased 7% from the second quarter of 2022 to the third quarter of 2022, and increased 4% from the third quarter of 2022 to the fourth quarter of 2022.

Although the underlying disease that we are treating is chronic and causes symptoms year-round, we believe the variation in patient flow through the offices of relevant physician specialists, and seasonality in disease flare-ups, has an impact on the number of patients that present themselves and who are therefore available to receive a new prescription for XHANCE. Demand has historically been, and we expect will continue to be, impacted by the INS market seasonality and the seasonal variation in patient visits with their doctor resulting in reduced XHANCE prescription demand in the third quarter.

Additionally, as we experienced in 2021 and 2022, we expect that the first quarter prescription demand and average net revenue per prescription for XHANCE will be adversely impacted in 2023 and future years by the annual resetting of patient healthcare insurance plan deductibles and changes in individual patients' healthcare insurance coverage, both of which often occur in January.

XHANCE Clinical Development

Nasal Polyps Program

Our clinical trial program for nasal polyps evaluated XHANCE in the following five clinical trials comprised of over 1,500 patients:

- two randomized, double-blinded, placebo-controlled Phase 3 pivotal clinical trials designed to compare the safety and efficacy of XHANCE to a placebo EDS in adults with bilateral nasal polyps, which we refer to as NAVIGATE I and NAVIGATE II or collectively, our pivotal clinical trials. Each of NAVIGATE I and NAVIGATE II had co-primary endpoints of (i) change in subjective nasal congestion/obstruction symptoms from baseline to week 4 and (ii) change in objectively measured total (bilateral) nasal polyp grade from baseline to week 16. These trials also evaluated several secondary endpoints, including the impact of XHANCE treatment on study-defined surgical eligibility criteria and changes in Sinonasal Outcome Test 22 score, which considers the core defining signs and symptoms of nasal polyps and the impact on functioning, quality of life and sleep. We also conducted a complete response analysis to evaluate the percentage of patients with a recorded nasal polyp grade of zero on at least one side of the nasal cavity.
- two open-label Phase 3 clinical trials which we refer to as EXHANCE-3 and EXHANCE-12 or collectively, as our supportive clinical trials, to evaluate the safety of XHANCE in adults with symptoms of chronic sinusitis with or without nasal polyps over an extended period of time (3 months in the case of EXHANCE-3 and 12 months in the case of EXHANCE-12). In these trials we also assessed a variety of objective and subjective efficacy parameters, including an assessment of each patient's symptoms and functioning and the impact of XHANCE treatment on study-defined surgical eligibility criteria.
- one Phase 1, open-label, randomized, single-dose, bioavailability study to compare the bioavailability of fluticasone propionate from XHANCE to Flonase™ and Flovent HFA™ in healthy patients and patients with mild-to-moderate asthma. We conducted this Phase 1 trial to establish a bridge between XHANCE, which

consists of our fluticasone propionate formulation combined with our EDS device, and Flonase™ and Flovent HFA™, the referenced listed drugs for our NDA. In our NDA, we relied in part on the FDA's previous findings of safety for Flonase™ and Flovent HFA™, including non-clinical toxicology findings and finding related to hypothalamic pituitary adrenal (HPA) axis suppression, which is a known side effect of corticosteroids. To do so, we were required to establish that the systemic exposure, or the amount of drug absorbed into the body, to fluticasone propionate following use of XHANCE did not exceed the exposure produced by Flovent HFA™.

Clinical Trial Highlights

Our Phase 3 clinical development program for nasal polyps included a population of patients generally reflective of our intended patient population, with approximately 90% having previously tried INS therapy and almost one-third having previously undergone sinus surgery. Key results from this Phase 3 clinical trial program include:

- In our pivotal clinical trials, XHANCE produced statistically significant benefits on both of the co-primary endpoints: a reduction of nasal congestion/obstruction symptoms at week 4 and a reduction in total polyp grade at week 16.
- In our Phase 3 clinical trials, patients with nasal polyps generally experienced greater improvements in symptoms and reductions in polyp grade with longer duration of use.
- In our pivotal clinical trials, approximately 16% of patients treated with XHANCE had nasal polyps eliminated (reduced to polyp grade 0) in at least one nostril after 16 weeks of treatment, and approximately 27% had nasal polyps eliminated in at least one nostril after an additional eight weeks of treatment. In our supportive trials, we observed complete response rates in at least one nostril of 48% of patients in EXHANCE-3 and 47.1% of patients in EXHANCE-12.
- In our pivotal clinical trials, XHANCE produced improvement across all four defining symptoms of chronic rhinosinusitis with nasal polyps.
- Over 85% of patients receiving XHANCE across our pivotal clinical trials reported improvement, and approximately two-thirds reported being "much" or "very much" improved, compared to approximately one-third of patients in the placebo EDS group. In our supportive clinical trials, approximately 70% of patients with symptoms of chronic sinusitis, both with and without nasal polyps, reported that they were "much" or "very much" improved after treatment with XHANCE.
- On a Sinonasal Outcome Test-22, the improvement with the 186- and 372- mcg doses of XHANCE was superior to the placebo EDS in both NAVIGATE I and NAVIGATE II. The magnitude of improvement associated with treatment with XHANCE was approximately 20 points. Although cross-trial comparisons have significant limitations and must be interpreted with caution, in a previous third-party study evaluating a large cohort (n=1468) of patients who were underwent sinus surgery, the degree of change on this outcome measure was approximately 18 points.
- After 12 months of treatment with XHANCE in our supportive clinical trials, at least 50% of patients had a Sinonasal Outcome Test-22 score that was at or below 9.3, which is the average score that has been reported for healthy individuals.
- XHANCE was well tolerated and had an adverse event profile generally similar to that observed in several comparably designed third party studies with traditional INS. The most common adverse reactions (incidence ≥ 3%) are epistaxis, nasal septal ulceration, nasopharyngitis, nasal mucosal erythema, nasal mucosal ulcerations, nasal congestion, acute sinusitis, nasal septal erythema, headache, and pharyngitis.

In connection with the approval of our NDA for XHANCE, the FDA required that we complete a clinical trial of XHANCE for the treatment of nasal polyps in pediatric patients by January 2022. Although this trial is ongoing, we will need to submit a request to the FDA to extend this deadline due to enrollment rates.

Chronic Sinusitis Program

In addition to XHANCE’s existing indication for the treatment of nasal polyps, in order to broaden our U.S. market opportunity, we conducted a clinical trial program in pursuit of a follow-on indication for the treatment of chronic sinusitis in the U.S. We believe XHANCE has the potential to be the first drug therapy approved by the FDA for the treatment of chronic sinusitis. We announced positive top-line results for ReOpen1 and ReOpen2 in March and

June 2022, respectively. In September 2022, we met with the FDA to discuss our planned sNDA for XHANCE as a treatment for adults with chronic sinusitis and submitted the sNDA in February 2023.

ReOpen1

Re-Open1 was a randomized double-blinded, placebo controlled Phase 3 clinical trial examining the safety and efficacy of XHANCE versus a placebo EDS in adults with chronic sinusitis with or without nasal polyps. ReOpen1 served as one of two pivotal clinical trials we submitted to the FDA with our sNDA in February 2023 for XHANCE for the treatment of adults with chronic sinusitis. This clinical trial was conducted in the United States, Canada, Sweden, Poland, Bulgaria, The Republic of Georgia and Russia.

Top-line results from ReOpen1 are summarized below.

Study Design

The clinical trial included a single-blind EDS-placebo lead-in and an EDS-placebo control group, a multi-center, multi-national study population to increase generalizability and an assessment of the safety and efficacy of multiple doses (186 or 372 mcg twice daily) over a 24-week period. A total of 332 adult subjects were enrolled in this study.

	Placebo EDS (N=110)	**OPN-375 186 µg (N=110)**	**OPN-375 372 µg (N=107)**
Full Analysis Set	110	110	107
Completed Study	96	102	101
Subjects Discontinuing Early	16	9	8
Subjects with Nasal Polyps	69	69	67
Subjects without Nasal Polyps	41	41	40

ReOpen1 had co-primary endpoints of (i) change in a composite score of nasal congestion/obstruction symptoms, nasal discharge, and facial pain and pressure from baseline to week, and (ii) change in average percent of opacified volume of the ethmoid and maxillary sinuses from baseline to week 24. The severity of nasal symptoms was recorded by patients in an electronic diary immediately before dosing in the morning (AM) and evening (PM), and was measured using 7-day average instantaneous AM diary scores. Each symptom was scored from 0-3. The volume of the ethmoid and maxillary sinuses occupied by disease was assessed using computer-assisted assessment of CT scans to determine the percentage (0-100%) of the sinus cavity space summed across all ethmoid and maxillary sinuses that was opacified. CT scans were performed at screening and at Week 24. This trial also evaluated several secondary endpoints, including the proportion of patients with acute disease exacerbations and their time to exacerbation and the Sinonasal Outcome Test-22 score, which considers the core defining signs and symptoms of chronic sinusitis and the impact on functioning, quality of life and sleep.

Top-Line Efficacy Results

The 186- and 372-mcg treatment groups achieved statistically significant reductions in the primary assessments of composite symptom scores at week 4 and reductions in the opacified volume of the maxillary and ethmoid sinuses on CT scans at week 24 relative to a placebo EDS.

The following table summarizes the mean change in composite symptom scores (or CSS) from baseline to week 4 and the change in the percent of opacified volume (or APOV) of the ethmoid and maxillary sinuses from baseline to week 24.

				Difference from Placebo EDS		
Treatment	**n**	**Baseline Score (Standard Deviation)**	**Mean (Standard Error) Change from Baseline**	**Mean**	**95% confidence interval**	**P-value (1)**
Change in CSS from Baseline to Week 4						
XHANCE 372 mcg	107	5.48 (1.83)	-1.60 (0.16)	-0.98	-1.43, -0.54	<0.001
XHANCE 186 mcg	110	5.42 (1.81)	-1.58 (0.16)	-0.97	-1.41, -0.52	<0.001
Placebo EDS	110	5.77 (1.78)	-0.62 (0.16)	-	-	-

Change in APOV in the Ethmoid and Maxillary Sinuses from Baseline to Week 24						
XHANCE 372 mcg	107	68.95 (18.84)	-6.20 (1.41)	-4.59	-8.41, -0.78	0.018
XHANCE 186 mcg	110	68.88 (19.51)	-5.58 (1.44)	-3.98	-7.86, -0.09	0.045
Placebo EDS	110	68.94 (20.33)	-1.60 (1.42)	-	-	-
The p-value, or probability value, is a measure of statistical significance reflecting the likelihood that an observed result occurred by chance.						

In addition to the co-primary efficacy endpoints described above, we also assessed a number of secondary endpoints in the trial, including the following:

- *Defining Symptoms (secondary endpoint*). The XHANCE 186- and 372-mcg treatment groups achieved statistically significant improvement relative to the subjects receiving placebo EDS on all four of the core defining symptoms of chronic sinusitis (nasal congestion, rhinorrhea, facial pain/pressure, and sense of smell) at week 4.
- *Acute exacerbations (secondary endpoint)*. The XHANCE 186- and 372-mcg treatment groups had a reduced occurrence of acute exacerbations of sinusitis relative to the subjects receiving placebo EDS which reached statistical significance in the high dose group.
- *Sinonasal Outcome Test-22 (secondary endpoint)*. The XHANCE 186- and 372-mcg treatment groups had statistically significant improvements in SNOT-22 scores by week 4 relative to the subjects receiving placebo EDS.

Although ReOpen1 was not designed or powered to detect statistical differences between the XHANCE treatment groups and placebo EDS in patient subgroups, we also performed the following subgroup analyses:

- *Subgroup Analysis - CSS*. The subgroup of chronic sinusitis patients without nasal polyps receiving XHANCE and the subgroup of chronic sinusitis patients with concomitant nasal polyps receiving XHANCE had statistically significant reductions in CSS scores relative to the subjects receiving placebo EDS in each of these subgroups despite the lack of powering for this subgroup analysis.
- *Subgroup Analysis - APOV*. The subgroup of chronic sinusitis patients with concomitant nasal polyps receiving XHANCE achieved a statistically significant reduction in APOV relative to the subjects receiving placebo EDS in this subgroup despite the lack of powering for this subgroup analysis. The subgroup of chronic sinusitis patients without nasal polyps receiving XHANCE did not achieve a statistically significant change in APOV relative to the subjects receiving placebo EDS in this subgroup.

Top-Line Safety Results

XHANCE was well tolerated across the 186- and 372-mcg dose groups and the safety profile in this trial was generally consistent with the safety profile contained in XHANCE's currently approved label. No serious adverse events were reported in ReOpen1. The table below summarizes adverse events that occurred at a rate of more than 3% with XHANCE and more common than the placebo EDS in this trial.

Summary of Adverse Events with XHANCE Reported in ≥ 3%
and More Common Than Placebo EDS in ReOpen1

Adverse Event (AE)	Placebo EDS BID (N =112) n (%)	XHANCE 186 mcg BID (N =111) n (%)	XHANCE 372 mcg BID (N =109) n (%)
Epistaxis	1 (0.9)	5 (4.5)	13 (11.9)
Nasopharyngitis	3 (2.7)	6 (5.4)	3 (2.8)
Asthma	1 (0.9)	5 (4.5)	4 (3.7)
Nuclear Cataract	0	5 (4.5)	4 (3.7)
Cortical Cataract	1 (0.9)	6 (5.4)	2 (1.8)

ReOpen2

ReOpen2 was a randomized double-blinded, placebo controlled Phase 3 clinical trial examining the safety and efficacy of XHANCE versus a placebo EDS in adults with chronic sinusitis without nasal polyps. ReOpen2 served as the second of two pivotal clinical trials we submitted to the FDA with our sNDA in February 2023 for XHANCE for the treatment of adults with chronic sinusitis. This clinical trial was conducted in the United States, Australia, Bulgaria, Czechia, New Zealand, Poland, Romania, Spain, The Republic of Georgia and the United Kingdom.

Top-line results from ReOpen2 are summarized below.

Study Design

The clinical trial included a single-blind EDS-placebo lead-in and an EDS-placebo control group, a multi-center, multi-national study population to increase generalizability and an assessment of the safety and efficacy of multiple doses (186 or 372 mcg twice daily) over a 24-week period. A total of 222 adult subjects were enrolled in this study.

	Placebo EDS (N=110)	**OPN-375 186 µg (N=110)**	**OPN-375 372 µg (N=107)**
Full Analysis Set	75	72	73
Completed Study	69	70	71
Subjects Discontinuing Early	6	3	3

ReOpen2 had co-primary endpoints of (i) change in a composite score of nasal congestion/obstruction symptoms, nasal discharge, and facial pain and pressure from baseline to week, and (ii) change in average percent of opacified volume of the ethmoid and maxillary sinuses from baseline to week 24. The severity of nasal symptoms was recorded by patients in an electronic diary immediately before dosing in the morning (AM) and evening (PM), and was measured using 7-day average instantaneous AM diary scores. Each symptom was scored from 0-3. The volume of the ethmoid and maxillary sinuses occupied by disease was assessed using computer-assisted assessment of CT scans to determine the percentage (0-100%) of the sinus cavity space summed across all ethmoid and maxillary sinuses that was opacified. CT scans were performed at screening and at Week 24. This trial also evaluated several secondary endpoints, including the proportion of patients with acute disease exacerbations and their time to exacerbation and the Sinonasal Outcome Test-22 score, which considers the core defining signs and symptoms of chronic sinusitis and the impact on functioning, quality of life and sleep.

Top-Line Efficacy Results

The 186- and 372-mcg treatment groups achieved statistically significant reductions in the primary assessments of composite symptom scores at week 4 and reductions in the opacified volume of the maxillary and ethmoid sinuses on CT scans at week 24 relative to a placebo EDS.

The following table summarizes the mean change in composite symptom scores (or CSS) from baseline to week 4 and the change in the percent of opacified volume (or APOV) of the ethmoid and maxillary sinuses from baseline to week 24.

				Difference from Placebo EDS		
Treatment	**n**	**Baseline Score (Standard Deviation)**	**Mean (Standard Error) Change from Baseline**	**Mean**	**95% confidence interval**	**P-value (1)**
Change in CSS from Baseline to Week 4						
XHANCE 372 mcg	73	5.97 (1.59)	-1.74 (0.20)	-0.93	-1.49, -0.37	0.001
XHANCE 186 mcg	72	5.87 (1.48)	-1.54 (0.20)	-0.73	-1.29, -0.17	0.011
Placebo EDS	75	6.15 (1.77)	-0.81 (0.20)	-	-	-
Change in APOV in the Ethmoid and Maxillary Sinuses from Baseline to Week 24						
XHANCE 372 mcg	73	61.50 (18.46)	-5.14 (1.74)	-6.33	-11.08, -1.58	0.009

XHANCE 186 mcg	72	60.51 (19.37)	-7.00 (1.73)	-8.19	-12.93, -3.45	<0.001
Placebo EDS	75	64.09 (17.74)	+1.19 (1.74)	-	-	-
1 - The p-value, or probability value, is a measure of statistical significance reflecting the likelihood that an observed result occurred by chance.						

Top-Line Safety Results

XHANCE was well tolerated across the 186- and 372-mcg dose groups and the safety profile in this trial was generally consistent with the safety profile contained in XHANCE's currently approved label. No serious adverse events were reported in ReOpen2. The table below summarizes adverse events that occurred at a rate of more than 3% with XHANCE and more common than the placebo EDS in this trial.

Summary of Adverse Events with XHANCE Reported in ≥ 3% and More Common Than Placebo EDS in ReOpen2

Adverse Event (AE)	**Placebo EDS BID (N =75) n (%)**	**XHANCE 186 mcg BID (N =73) n (%)**	**XHANCE 372 mcg BID (N =74) n (%)**
COVID-19	2 (2.7)	3 (4.1)	7 (9.5)
Epistaxis	0	4 (5.5)	7 (9.5)
Headache	6 (8.0)	2 (2.7)	7 (9.5)
Depression	1 (1.3)	0	3 (4.1)

Pooled Results from the ReOpen Program

In July 2022, we announced selected pooled results from the ReOpen program. First, to inform possible differences in response of patients previously using a standard nasal steroid spray, a pre-planned analysis of pooled data assessed symptom improvement for patients entering the trials with at least moderate symptoms despite reporting use of a standard nasal steroid spray. For this subgroup, patients receiving XHANCE improved more from baseline than patients receiving placebo comparator. Second, a pooled analysis was performed to assess change in CT scans, measured by APOV at week 24, for the subgroup of patients receiving XHANCE who had chronic sinusitis without nasal polyps. Compared to patients treated with placebo comparator, XHANCE treatment produced greater reduction in sinus opacification in this subgroup. Differences between active and placebo in 186 mcg or 372 mcg XHANCE treatment groups were similar and nominally statistically significant. Finally, an analysis of pooled data found that the 372 mcg treatment group achieved a type 1 error controlled statistically significant reduction of 66% in the incidence of exacerbations compared to placebo comparator. Reductions in the number of exacerbations, ranging from 53 to 80%, were found for subgroups of chronic sinusitis patients with or without nasal polyps in the 186 mcg or 372 mcg XHANCE treatment groups in additional pre-planned exploratory analyses that were not type 1 error controlled. Exacerbations were defined as a worsening of at least one of the four cardinal symptoms of chronic sinusitis (nasal congestion/obstruction, rhinorrhea, facial pain/pressure, and loss of sense of smell) lasting at least 3 days accompanied by an escalation in medical care, such as doctor visits or antibiotic or steroid prescription.

In addition, we completed an analysis of mean change in APOV by Patient-Reported Global Change Score (PGIC). The PGIC is a 7-point Likert scale on which the subject directly reports their perceived overall change in disease since initiating study medication.

The following three tables summarize these results.

				Difference from Placebo EDS	
Treatment	**n**	**Baseline Score**	**LS Mean Change from Baseline**	**LS Mean**	**Nominal P-value (1)**
Change in Symptoms in Prior Nasal Steroid Users from Baseline to Week 4 (Pooled)					
XHANCE 186 or 372 mcg	172	5.63	-1.46	-0.7	<0.001
Placebo EDS	108	5.84	-0.77	-	-
Change in APOV in CS Patients without Nasal Polyps from Baseline to Week 24 (Pooled)					
XHANCE 186 or 372 mcg	225	61.33	-6.31	-4.76	0.004

XHANCE 372 mcg	112	61.26	-6.5	-4.95	0.01
XHANCE 186 mcg	113	61.4	-6.12	-4.57	0.019
Placebo EDS	116	63.32	-1.55	-	-

Treatment Group	n	Events	LS Mean	Incidence Rate Ratio (Active/PBO)	P-value [1]
Frequency of Exacerbations over 24 Weeks (Full Analysis Set/All Patients)					
XHANCE 186 or 372 mcg	362	35	0.081	0.389	0.001
XHANCE 372 mcg	180	15	0.072	0.343	0.002[2]
XHANCE 186 mcg	182	20	0.092	0.441	0.012
Placebo EDS	185	41	0.208	-	-
Frequency of Exacerbations over 24 Weeks (Patients with Nasal Polyps)					
XHANCE 186 or 372 mcg	137	12	0.052	0.276	0.005
XHANCE 372 mcg	68	4	0.038	0.203	0.01
XHANCE 186 mcg	69	8	0.07	0.376	0.055
Placebo EDS	69	17	0.187	-	-
Frequency of Exacerbations over 24 Weeks (Patients without Nasal Polyps)					
XHANCE 186 or 372 mcg	225	23	0.113	0.472	0.032
XHANCE 372 mcg	112	11	0.113	0.47	0.077
XHANCE 186 mcg	113	12	0.113	0.474	0.076
Placebo EDS	116	24	0.239	-	-

1. The p-value, or probability value, is a measure of statistical significance reflecting the likelihood that an observed result occurred by chance and compares the indicated group to the relevant placebo EDS group. Unless otherwise noted, all p-values shown in this table represent nominal p-values (meaning they are exploratory, not type 1 error controlled) and therefore have an increased possibility of being a chance finding
2. This p-value for all patients receiving XHANCE 372 mcg in the ReOpen Program is a type 1 error controlled statistically significant result. All other p-values shown in this table are nominal p-values.

Mean change in APOV by Patient-Reported Global Change Score at Week 24							
	PGIC Category						
	Very Much Improved	Much Improved	Minimally Improved	No Change	Minimally Worsened	Much Worsened	Very Much Worsened
Subjects	67	64	164	90	16	10	4
Mean Change in APOV	(10.53)%	(7.26)%	(2.86)%	(0.32)%	2.01 %	4.82 %	5.30 %

Pooled Safety Results from the ReOpen Program

XHANCE was well tolerated across the 186- and 372-mcg dose groups and the safety profile in the ReOpen program was generally consistent with the safety profile contained in XHANCE's currently approved label. No serious adverse events were reported in the ReOpen program. The table below summarizes adverse events that occurred at a rate of more than 3% with XHANCE and more common than the placebo EDS in this trial.

Summary of Adverse Events with XHANCE Reported in ≥ 3% and More Common Than Placebo EDS in Pooled data

Adverse Event (AE)	Placebo EDS BID (N =187) n (%)	XHANCE 186 mcg BID (N =184) n (%)	XHANCE 372 mcg BID (N =183) n (%)
Epistaxis	1 (0.5)	9 (4.9)	20 (10.9)
COVID-19	8 (4.3)	5 (2.7)	12 (6.7)
Nasopharyngitis	8 (4.3)	9 (4.9)	7 (3.8)
Headache	7 (3.7)	4 (2.2)	10 (5.5)

Intellectual Property and Barriers to Entry

XHANCE benefits from substantial intellectual property and barriers to entry, including the following:

- ***Strong patent protection.*** Our XHANCE U.S. patent portfolio consists of 13 issued device and method of use patents expiring on various dates from 2023 through 2036, three issued design patents expiring through 2030 and pending patent applications. We rely primarily on the protections afforded by device and method of use patents. Our issued U.S. patents and patent applications for XHANCE are based on the EDS and related technology, including the combination of this technology with fluticasone propionate.
- ***Complex drug-delivery system.*** We believe the unique features of our liquid EDS device, as well as its delivery of a topical-acting corticosteroid, affords us significant protection against generic competition, as well as against a potential 505(b)(2) NDA, that seeks to reference XHANCE in order to obtain approval for a therapeutically equivalent, substitutable competitor product. XHANCE, utilizing our liquid EDS device, presents technical and human factors engineering complexities for drug-device combination products and chemistry, manufacturing and controls challenges unique to suspension and respiratory products. Any future substitutable generic entrant will need to have considerable combination product know-how to develop and validate a substitutable drug delivery device or technology to compete with XHANCE.
- ***Clinical and regulatory complexity.*** We conducted a clinical development program comprised of over 1,500 patients to support FDA approval of our NDA for XHANCE for the treatment of nasal polyps, including human factors studies and Phase 3 clinical trial assessments evaluating and validating the use of XHANCE. As with other drugs that primarily have local activity, we believe the regulatory pathway for products seeking approval as substitutable generic equivalents to XHANCE will be more complex and costly than the pharmacokinetic studies generally required for systemically-acting medications. We believe that any future substitutable generic competitors may be required to conduct, among other things, non-inferiority clinical trials demonstrating equivalent efficacy and safety outcomes to establish clinical bioequivalence to XHANCE. We believe these clinical trials, if required, would necessitate a significant amount of time and capital investment and present clinical development uncertainties. However, the FDA has included XHANCE on the list of upcoming product specific guidances for complex generic drug products that the FDA plans to issue, which may provide clarity for generic competitors to develop generic products that compete with XHANCE.

Intellectual Property

We strive to protect our proprietary technology that we believe is important to our business, including seeking and maintaining patents intended to cover our product candidates and technologies that are important to the development of our business. We also rely on trade secrets to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection, as well as know-how, trademarks, continuing technological innovation and in-licensing opportunities to develop and maintain our proprietary position. We internally developed our intellectual property related to XHANCE, Onzetra Xsail, the Exhalation Delivery System and related technologies. We have sought and intend to continue to seek appropriate patent protection for our product candidates, as well as other proprietary technologies and their uses by filing patent applications in the U.S. and other select countries.

Patents

As of February 1, 2023, we owned over 60 U.S. patents expiring between 2023 and 2036, and pending U.S. patent applications. In addition to our U.S. intellectual property, as of February 1, 2023, we also owned over 200 foreign issued patents expiring between 2022 and 2035, and foreign patent applications. As part of actions intended to reduce operating expenses, we intend to reduce the scope of our patent portfolio primarily in certain foreign countries where we believe commercial potential is more limited.

Our XHANCE U.S. patent portfolio consists of 13 issued device and method of use patents expiring on various dates from 2023 through 2036, three issued design patents expiring between 2029 and 2030 and pending patent applications. The 13 device and method of use patents are published in the FDA's Approved Drug Products with Therapeutic Equivalence Evaluations, commonly known as the Orange Book. Drugs listed in the Orange Book can, in turn, be cited by potential generic competitors in support of approval of an abbreviated NDA (ANDA), or a 505(b)(2) NDA. If any of these potential generic competitors claim that their product will not infringe XHANCE's listed patents, or that such patents are invalid, then they must send notice to us once the ANDA or 505(b)(2) NDA has been accepted for filing by the FDA. We may then initiate a patent infringement lawsuit in response to the notice of the Paragraph IV certification, which would automatically prevent the FDA from approving the ANDA or 505(b)(2) NDA until the earlier of 30 months, expiration of the patent, settlement of the lawsuit, or a decision in the infringement case that is favorable to the ANDA or 505(b)(2) NDA applicant.

The rest of our patent portfolio largely relates to patents and applications owned by us and directed to Onzetra Xsail and other product candidates, and the powder EDS, liquid EDS and related technologies.

Trade Secrets and Other Proprietary Information

We seek to protect our proprietary information, including our trade secrets and proprietary know-how, by requiring our employees, consultants and other advisors to execute confidentiality agreements upon the commencement of their employment or engagement. These agreements generally provide that all confidential information developed or made known during the course of the relationship with us be kept confidential and not be disclosed to third parties except in specific circumstances. In the case of our employees, the agreements also typically provide that all inventions resulting from work performed for us, utilizing our property or relating to our business and conceived or completed during employment shall be our exclusive property to the extent permitted by law. Where appropriate, agreements we obtain with our consultants also typically contain similar assignment of invention provisions. Further, we generally require confidentiality agreements from business partners and other third parties that receive our confidential information.

Trademarks

We also rely on trademarks and trade designs to develop and maintain our competitive position. OPTINOSE®, XHANCE®, Exhalation Delivery System™ and EDS® are trademarks of ours in the U.S.

Licensing of the Exhalation Delivery System (Outside of ENT/Allergy Indications)

Currax License Agreement

On September 25, 2019, OptiNose AS, our wholly-owned subsidiary, entered into the Currax License Agreement. Under the terms of the Currax License Agreement, we granted Currax an exclusive license to certain OptiNose patents and a non-exclusive license to certain OptiNose know-how to use, sell, offer for sale, have sold and import Onzetra® Xsail® (sumatriptan nasal powder) in the U.S., Canada and Mexico.

Under the terms of the Currax License Agreement, we received a $3.7 million upfront payment in 2019, and an additional $0.75 million in December 2020 upon expiration of the escrow that was established for a limited period to cover potential indemnification obligations, and an additional $1.0 million milestone payment in January 2021 upon the achievement of a specified regulatory milestone. We do not expect to receive any further payments from Currax under the terms of the License Agreement other than reimbursement for certain expenses.

License Agreement with Centessa Pharmaceuticals

On January 31, 2019, OptiNose AS entered into a licensing agreement with Inexia Limited (now Orexia Therapeutics, which is a wholly-owned subsidiary of Centessa Pharmaceuticals (the Centessa License Agreement). Under the terms of the Centessa License Agreement, we granted Orexia an exclusive, royalty-bearing, worldwide, non-transferable, sublicensable license to the EDS and other intellectual property for the development, sale, import and manufacture of products containing orexin receptor agonist and/or orexin receptor positive modulator

molecule(s) as the sole active pharmaceutical ingredient(s) for the treatment, diagnosis or prevention of human diseases or conditions associated primarily with orexin receptor agonism and orexin receptor positive modulation. The license excludes the treatment of any disease or condition affecting the ear, nose or throat, or the treatment of any disease or condition associated primarily with another receptor, other than the Orexin 1 and Orexin 2 receptors. Orexia is solely responsible for all costs and activities related to its identification, development and commercialization of products under the Centessa License Agreement.

Under the terms of the Centessa License Agreement, we received a $0.5 million upfront payment. For each product developed under the Centessa License Agreement, we are eligible to receive up to $8.0 million of development milestone payments and up to $37.0 million of sales milestone payments. In addition, we are eligible to receive tiered, low-to-mid single digit royalties based on net sales of any products successfully developed and commercialized under the Centessa License Agreement. We do not anticipate the receipt of any milestone or royalty payments from Orexia in the near term.

Government Regulation

We are subject to extensive regulation by the FDA and other federal, state, and local regulatory agencies. The Federal Food, Drug and Cosmetic Act (the FD&C Act) and the FDA's implementing regulations set forth, among other things, requirements for the testing, development, manufacture, quality control, safety, effectiveness, approval, labeling, storage, record-keeping, reporting, distribution, import, export, sale, advertising and promotion of our products and product candidates. Although the discussion below focuses on regulation in the U.S., because that is currently our primary focus, we may seek approval for, and market, our products in other countries in the future. Generally, our activities in other countries will be subject to regulation that is similar in nature and scope as that imposed in the U.S., although there can be important differences.

Development and Approval

Under the FD&C Act, FDA approval of an NDA is required before any new drug can be marketed in the U.S. NDAs require extensive studies and submission of a large amount of data by the applicant.

Preclinical Testing. Before testing any compound in human patients in the U.S., a company must generate extensive preclinical data. Preclinical testing generally includes laboratory evaluation of product chemistry and formulation, as well as toxicological and pharmacological studies in several animal species to assess the toxicity and dosing of the product. Certain animal studies must be performed in compliance with the FDA's Good Laboratory Practice (GLP) regulations and the U.S. Department of Agriculture's Animal Welfare Act.

IND Application. Human clinical trials in the U.S. cannot commence until an investigational new drug (IND) application is submitted and becomes effective. A company must submit preclinical testing results to the FDA as part of the IND, and the FDA must evaluate whether there is an adequate basis for testing the drug in initial clinical studies in human volunteers. Unless the FDA raises concerns, the IND becomes effective 30 days following its receipt by the FDA, and the clinical trial proposed in the IND may begin. Once human clinical trials have commenced, the FDA may stop a clinical trial by placing it on "clinical hold" because of concerns about the safety of the product being tested, or for other reasons.

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

A study sponsor is required to publicly post specified details about certain clinical trials and clinical trial results on government or independent websites (e.g., http://clinicaltrials.gov). Human clinical trials typically are conducted in three sequential phases, although the phases may overlap, be combined, or be subdivided in some cases:

- Phase 1 clinical trials involve the initial administration of the investigational drug to humans, typically to a small group of healthy human subjects, but occasionally to a group of patients with the targeted disease or disorder. Phase 1 clinical trials generally are intended to evaluate the safety, metabolism and pharmacologic actions of the drug, the side effects associated with increasing doses, and, if possible, to gain early evidence of effectiveness.
- Phase 2 clinical trials generally are controlled studies that involve a relatively small sample of the intended patient population, and are designed to develop initial data regarding the product's effectiveness, to determine dose response and the optimal dose range, and to gather additional information relating to safety and potential AEs.
- Phase 3 clinical trials are conducted after preliminary evidence of effectiveness has been obtained, and are intended to gather the additional information about safety and effectiveness necessary to evaluate the drug's overall risk-benefit profile, and to provide a basis for physician labeling. Generally, Phase 3 clinical development programs consist of expanded,multi-site, large-scale studies of patients with the target disease or disorder to obtain statistical evidence of the efficacy and safety of the drug at the proposed dosing regimen.Phase 3 data often form the core basis on which the FDA evaluates a drug’s safety and effectiveness when considering the product application.

The sponsoring company, the FDA, or the IRB may suspend or terminate a clinical trial at any time on various grounds, including a finding that the patients are being exposed to an unacceptable health risk. Further, success in early-stage clinical trials does not assure success in later-stage clinical trials. Data obtained from clinical activities are not always conclusive and may be subject to alternative interpretations that could delay, limit or prevent regulatory approval.

NDA Submission and Review. The FD&C Act provides two pathways for the approval of new drugs through an NDA. An NDA under Section 505(b)(1) of the FD&C Act is a comprehensive application to support approval of a product candidate that includes, among other things, data and information to demonstrate that the proposed drug is safe and effective for its proposed uses, that production methods are adequate to ensure its identity, strength, quality, and purity of the drug, and that proposed labeling is appropriate and contains all necessary information. A 505(b)(1) NDA contains results of the full set of preclinical studies and clinical trials conducted by or on behalf of the applicant to characterize and evaluate the product candidate.

Section 505(b)(2) of the FD&C Act provides an alternate regulatory pathway to obtain FDA approval that permits the filing of an NDA where at least some of the information required for approval comes from studies not conducted by or for the applicant and for which the applicant has not obtained a right of reference. The applicant may rely to some extent upon the FDA's findings of safety and effectiveness for an approved product that acts as the reference drug and submit its own product-specific data — which may include data from preclinical studies or clinical trials conducted by or on behalf of the applicant — to address differences between the product candidate and the reference drug. We obtained FDA approval of XHANCE through the Section 505(b)(2) regulatory approval pathway, with Flonase™ and Flovent HFA™ as the reference drugs. Flonase™ and Flovent HFA™ contain fluticasone propionate, which is also the active ingredient in XHANCE.

The submission of an NDA under either Section 505(b)(1) or Section 505(b)(2) generally requires payment of a substantial user fee to the FDA. The FDA reviews applications to determine, among other things, whether a product is safe and effective for its intended use and whether the manufacturing controls are adequate to assure and preserve the product's identity, strength, quality, and purity. For some NDAs, the FDA may convene an advisory committee to seek insights and recommendations on issues relevant to approval of the application. Although the FDA is not bound by the recommendation of an advisory committee, the agency considers such recommendations carefully when making decisions.

Our product and product candidates include products that combine drug and device components in a manner that the FDA considers to meet the definition of a "combination product" under FDA regulations. The FDA exercises significant discretion over the regulation of combination products, including the discretion to require separate marketing applications for the drug and device components in a combination product. For XHANCE, FDA's Center for Drug Evaluation and Research (CDER) had primary jurisdiction for review of the NDA, and both the drug and

device were reviewed under one marketing application. However, for a drug-device combination product CDER typically consults with the Center for Devices and Radiological Health in the NDA review process.

The FDA may determine that a Risk Evaluation and Mitigation Strategy (REMS) is necessary to ensure that the benefits of a new product outweigh its risks, and the product can therefore be approved. A REMS may include various elements, ranging from a medication guide or patient package insert to limitations on who may prescribe or dispense the drug, depending on what the FDA considers necessary for the safe use of the drug. Under the Pediatric Research Equity Act, certain applications for approval must also include an assessment, generally based on clinical study data, of the safety and effectiveness of the subject drug in relevant pediatric populations. Before approving an NDA, the FDA 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 current Good Manufacturing Practice (cGMP) requirements and adequate to assure consistent production of the product within required specifications.

Once the FDA accepts an NDA submission — which occurs, if at all, within 60 days after submission of the NDA — the FDA's goal for a non-priority review of an NDA is ten months. The review process can be and often is significantly extended, however, by FDA requests for additional information, studies, or clarification. After review of an NDA and the facilities where the product is manufactured, the FDA either issues an approval letter or a complete response letter (CRL) outlining the deficiencies in the submission. The CRL may require additional testing or information, including additional preclinical or clinical data. Even if such additional information and data are submitted, the FDA may decide that the NDA still does not meet the standards for approval. Data from clinical trials are not always conclusive and the FDA may interpret data differently than the sponsor.

Obtaining regulatory approval often takes a number of years, involves the expenditure of substantial resources, and depends on a number of factors, including the severity of the disease in question, the availability of alternative treatments, and the risks and benefits demonstrated in clinical trials. Additionally, as a condition of approval, the FDA may impose restrictions that could affect the commercial success of a drug or require post-approval commitments, including the completion within a specified time period of additional clinical studies, which often are referred to as "Phase 4" or "post-marketing" studies.

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

Post-Approval Regulation

Once approved, drug products are subject to continuing regulation by the FDA. If ongoing regulatory requirements are not met or if safety or manufacturing problems occur after the product reaches the market, the FDA may at any time withdraw product approval or take actions that would limit or suspend marketing. Additionally, the FDA may require post-marketing studies or clinical trials, changes to a product’s approved labeling, including the addition of new warnings and contraindications, or the implementation of other risk management measures, including distribution-related restrictions, if there are new safety information developments.

Good Manufacturing Practices. Companies engaged in manufacturing drug products or their components must comply with applicable cGMP requirements and product-specific regulations enforced by the FDA and other regulatory agencies. Compliance with cGMP includes adhering to requirements relating to organization and training of personnel, buildings and facilities, equipment, control of components and drug product containers and closures, production and process controls, quality control and quality assurance, packaging and labeling controls, holding and distribution, laboratory controls, and records and reports. The FDA regulates and inspects equipment, facilities, and processes used in manufacturing pharmaceutical products prior to approval. If, after receiving approval, a company makes a material change in manufacturing equipment, location, or process (all of which are, to some degree, incorporated in the NDA), additional regulatory review and approval may be required. The FDA also conducts regular, periodic visits to re-inspect equipment, facilities, and processes following the initial approval of a product. Failure to comply with applicable cGMP requirements and conditions of product approval may lead the FDA to take enforcement action or seek sanctions, including fines, issuance of warning letters, civil penalties, injunctions, suspension of manufacturing operations, operating restrictions, withdrawal of FDA approval, seizure or recall of products, and criminal prosecution. Although we periodically monitor the FDA compliance of our third-party manufacturers, we cannot be certain that our present or future third-party manufacturers will consistently comply with cGMP and other applicable FDA regulatory requirements.

We also need to comply with some of the FDA's manufacturing and safety regulations for devices. In addition to cGMP, the FDA requires that our drug-device combination product comply with the Quality System Regulation (QSR), which sets forth the FDA's manufacturing quality standards for medical devices. The FDA also requires that we comply with some device safety reporting requirements for our drug-device combination product.

Advertising and Promotion. The FDA and other federal regulatory agencies closely regulate the marketing and promotion of drugs through, among other things, standards and regulations for direct-to-consumer advertising, advertising and promotion to healthcare professionals, communications regarding unapproved uses, industry-sponsored scientific and educational activities, and promotional activities involving the Internet. A product cannot be commercially promoted before it is approved. After approval, product promotion can include only those claims relating to safety and effectiveness that are consistent with the labeling approved by the FDA. Healthcare providers are permitted to prescribe drugs for "off-label" uses — that is, uses not approved by the FDA and not described in the product's labeling — because the FDA does not regulate the practice of medicine. However, FDA regulations impose restrictions on manufacturers' communications regarding off-label uses. Broadly speaking, a manufacturer may not promote a drug for off-label use, but under certain conditions may engage in non-promotional, balanced, scientific communication regarding off-label use. In addition to FDA restrictions on marketing of pharmaceutical products, state and federal fraud and abuse laws have been applied to restrict certain marketing practices in the pharmaceutical industry. Failure to comply with applicable FDA requirements and restrictions in this area may subject a company to adverse publicity and enforcement action by the FDA, the Department of Justice, or the Office of the Inspector General of the Department of Health and Human Services, as well as state authorities. This could subject a company to a range of penalties that could have a significant commercial impact, including civil and criminal fines and agreements that materially restrict the manner in which a company promotes or distributes a drug.

Other Requirements. NDA holders must comply with other regulatory requirements, including submitting annual reports, reporting information about adverse drug experiences, and maintaining certain records.

Hatch-Waxman Act

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

Generic Drugs. A generic version of an approved drug is approved by means of an ANDA, by which the sponsor demonstrates that the proposed product is the same as the approved, brand-name drug, which is referred to as the reference listed drug (RLD). Generally, an ANDA must contain data and information showing that the proposed generic product and RLD (i) have the same active ingredient, in the same strength and dosage form, to be delivered via the same route of administration, (ii) are intended for the same uses, and (iii) are bioequivalent. This is instead of independently demonstrating the proposed product's safety and effectiveness, which are inferred from the fact that the product is the same as the RLD, which the FDA previously found to be safe and effective.

505(b)(2) NDAs. As discussed above, if a product is similar, but not identical, to an already approved product, it may be submitted for approval via an NDA under section 505(b)(2) of the FD&C Act. Unlike an ANDA, this does not excuse the sponsor from demonstrating the proposed product's safety and effectiveness. Rather, the sponsor is permitted to rely to some degree on information from investigations that were not conducted by or for the applicant and for which the applicant has not obtained a right of reference, and must submit its own product-specific data of safety and effectiveness to an extent necessary because of the differences between the products. An NDA approved under 505(b)(2) may in turn serve as an RLD for subsequent applications from other sponsors.

RLD Patents. In an NDA, a sponsor must identify patents that claim the drug substance or drug product or a method of using the drug. When the drug is approved, those patents are among the information about the product that is listed in the FDA publication, *Approved Drug Products with Therapeutic Equivalence Evaluations*, which is referred to as the *Orange Book*. The sponsor of an ANDA or 505(b)(2) application seeking to rely on an approved product as the RLD must make one of several certifications regarding each listed patent. A “Paragraph I” certification is the sponsor’s statement that patent information has not been filed for the RLD. A “Paragraph II” certification is the sponsor’s statement that the RLD’s patents have expired. A "Paragraph III" certification is the sponsor's statement that it will wait for the patent to expire before obtaining approval for its product. A "Paragraph IV" certification is an assertion that the patent does not block approval of the later product, either because the patent is invalid or unenforceable or because the patent, even if valid, is not infringed by the new product.

Regulatory Exclusivities. The Hatch-Waxman Act provides periods of regulatory exclusivity for products that would serve as RLDs for an ANDA or 505(b)(2) application. If a product is a "new chemical entity," or NCE — generally meaning that the active moiety has never before been approved in any drug — there is a period of five years from the product's approval during which the FDA may not accept for filing any ANDA or 505(b)(2) application for a drug with the same active moiety. An ANDA or 505(b)(2) application may be submitted after four years, however, if the sponsor of the application makes a Paragraph IV certification.

A product that is not an NCE may qualify for a three-year period of exclusivity if the NDA contains new clinical data, (other than bioavailability studies) derived from studies conducted by or for the sponsor, that were necessary for approval. In that instance, the exclusivity period does not preclude filing or review of an ANDA or 505(b)(2) application; rather, the FDA is precluded from granting final approval to the ANDA or 505(b)(2) application until three years after approval of the RLD. Additionally, the exclusivity applies only to the conditions of approval that required submission of the clinical data.

Once the FDA accepts for filing an ANDA or 505(b)(2) application containing a Paragraph IV certification, the applicant must within 20 days provide notice to the RLD or listed drug NDA holder and patent owner that the application has been submitted, and provide the factual and legal basis for the applicant's assertion that the patent is invalid or not infringed. If the NDA holder or patent owner files suit against the ANDA or 505(b)(2) applicant for patent infringement within 45 days of receiving the Paragraph IV notice, the FDA is prohibited from approving the ANDA or 505(b)(2) application for a period of 30 months or the resolution of the underlying suit, whichever is earlier. If the RLD has NCE exclusivity and the notice is given and suit filed during the fifth year of exclusivity, the regulatory stay extends until 7.5 years after the RLD approval. The FDA may approve the proposed product before the expiration of the regulatory stay if a court finds the patent invalid or not infringed or if the court shortens the period because the parties have failed to cooperate in expediting the litigation. In connection with the submission of our sNDA for XHANCE in February 2023, we provided Paragraph IV certification notices to the NDA holder and patent owner of the two unexpired Orange Book-listed patents covering Flovent HFA. As noted above, these parties have 45 days from receiving the Paragraph IV certification notices to file a patent infringement suit which would prohibit the FDA from approving our sNDA for up to 30-months.

If the RLD has NCE exclusivity and the notice is given and suit filed during the fifth year of exclusivity, the regulatory stay extends until 7.5 years after the RLD approval. The FDA may approve the proposed product before the expiration of the regulatory stay if a court finds the patent invalid or not infringed or if the court shortens the period because the parties have failed to cooperate in expediting the litigation.

Patent Term Restoration. A portion of the patent term lost during product development and FDA review of an NDA is restored if approval of the application is the first permitted commercial marketing of a drug containing the active ingredient. The patent term restoration period is generally one-half the time between the effective date of the IND or the date of patent grant (whichever is later) and the date of submission of the NDA, plus the time between the date of submission of the NDA and the date of FDA approval of the product. The maximum period of restoration is five years, and the patent cannot be extended to more than 14 years from the date of FDA approval of the product. Only one patent claiming each approved product is eligible for restoration and the patent holder must apply for restoration within 60 days of approval. The U.S. Patent and Trademark Office (USPTO) in consultation with the FDA, reviews and approves the application for patent term restoration.

Other Exclusivities

Pediatric Exclusivity. Section 505A of the FD&C Act provides for six months of additional exclusivity or patent protection if an NDA sponsor submits pediatric data that fairly respond to a written request from the FDA for such data. The data does not need to show that the product is effective in the pediatric population studied; rather, if the clinical trial is deemed to fairly respond to the FDA's request, the additional protection is granted. If reports of requested pediatric studies are submitted to and accepted by FDA within the statutory time limits, whatever statutory or regulatory periods of exclusivity or *Orange Book* listed patent protection that cover the drug are extended by six months. This is not a patent term extension, but it effectively extends the regulatory period during which the FDA cannot approve an ANDA or 505(b)(2) application owing to regulatory exclusivity or listed patents. When any product is approved, we will evaluate seeking pediatric exclusivity as appropriate.

Orphan Drug Exclusivity. The Orphan Drug Act provides incentives for the development of drugs intended to treat rare diseases or conditions, which generally are diseases or conditions affecting less than 200,000 individuals in the U.S. If a sponsor demonstrates that a drug product qualifies for orphan drug designation, the FDA grants orphan drug designation to the product for that use. The benefits of orphan drug designation include research and development tax credits and exemption from user fees. A drug that is approved for the orphan drug designated

indication generally is granted seven years of orphan drug exclusivity. During that period, the FDA generally may not approve any other application for the same product for the same indication, although there are exceptions, most notably when the later product is shown to be clinically superior to the product with exclusivity. The FDA can revoke a product's orphan drug exclusivity under certain circumstances, including when the product sponsor is unable to assure the availability of sufficient quantities of the product to meet patient needs. Orphan drug exclusivity does not prevent the FDA from approving a different drug for the same disease or condition, or the same drug for a different disease or condition.

U.S. Healthcare Reform

The Patient Protection and Affordable Care Act, as amended (the "Affordable Care Act"), is a sweeping measure intended to expand healthcare coverage within the U.S., primarily through the imposition of health insurance mandates on employers and individuals and expansion of the Medicaid program. This law substantially changed the way healthcare is financed by both governmental and private insurers and significantly impacts the pharmaceutical industry. Changes that may affect our business include those governing enrollment in federal healthcare programs, reimbursement changes, benefits for patients within a coverage gap in the Medicare Part D prescription drug program (commonly known as the "donut hole"), rules regarding prescription drug benefits under the health insurance exchanges, changes to the Medicaid Drug Rebate program, expansion of the Public Health Service Act's 340B drug pricing program (340B Program), fraud and abuse, and enforcement. These changes impact existing government healthcare programs and have resulted in the development of new programs, including Medicare payment for performance initiatives. Details of the changes to the Medicaid Drug Rebate program and the 340B Program are discussed under the risk factor "*If we fail to comply with our reporting and payment obligations under the Medicaid drug rebate program, or other governmental pricing programs, we could be subject to additional reimbursement requirements, penalties, sanctions and fines which could have a material adverse effect on our business, financial condition, results of operations and growth prospects*" in the "Risk Factors" section of this Annual Report on Form 10-K.

Some states have elected not to expand their Medicaid programs to individuals with an income of up to 133% of the federal poverty level, as is permitted under the Affordable Care Act. For each state that does not choose to expand its Medicaid program, there may be fewer insured patients overall, which could impact our sales of products and product candidates for which we receive regulatory approval, and our business and financial condition. Where new patients receive insurance coverage under any of the new Medicaid options made available through the Affordable Care Act, the possibility exists that manufacturers may be required to pay Medicaid rebates on drugs used under these circumstances, a decision that could impact manufacturer revenues.

Certain provisions of the Affordable Care Act have been subject to judicial challenges, as well as efforts to modify them or to alter their interpretation and implementation. For example, on December 22, 2017, the U.S. government signed into law comprehensive tax legislation, referred to as the Tax Cuts and Jobs Act (the Tax Act), which includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Further, the Bipartisan Budget Act of 2018, among other things, amended the Medicare statute to reduce the coverage gap in most Medicare drug plans, commonly known as the "donut hole," by raising the required manufacturer point-of-sale discount for pharmaceutical manufacturers who participate in Medicare Part D from 50% to 70% off the negotiated price effective as of January 1, 2019. The IRA (defined below) replaces the Part D coverage gap discount program with a new Part D manufacturer discount program beginning in 2025.

It is unclear how efforts to modify or invalidate the Affordable Care Act or its implementing regulations, or portions thereof, will affect the Affordable Care Act or our business. Additional legislative changes, regulatory changes, and further judicial challenges related to the Affordable Care Act remain possible. Any such changes could decrease the number of individuals with health coverage. It is possible that the Affordable Care Act, as currently enacted or as it or its implementation may be modified in the future, and other healthcare reform measures that may be adopted in the future, could have a material adverse effect on our industry generally and on our ability to maintain or increase sales of our products or product candidates for which we receive regulatory approval or to successfully commercialize our products and product candidates.

Additionally, on December 20, 2019, then-President Trump signed the Further Consolidated Appropriations Act for 2020 into law (P.L. 116-94) that includes a piece of bipartisan legislation called the Creating and Restoring Equal Access to Equivalent Samples Act of 2019 or "the CREATES Act." The CREATES Act aims to address the concern articulated by both the FDA and others in the industry that some brand manufacturers have improperly restricted the distribution of their products, including by invoking the existence of a REMS for certain products, to deny generic

product developers access to samples of brand products. Because generic product developers need samples to conduct certain comparative testing required by the FDA, some have attributed the inability to timely obtain samples as a cause of delay in the entry of generic products. To remedy this concern, the CREATES Act establishes a private cause of action that permits a generic product developer to sue the brand manufacturer to compel it to furnish the necessary samples on “commercially reasonable, market-based terms.” In 2021 and 2022 we provided units of XHANCE to a generic manufacturer in compliance with the CREATES Act.

Coverage and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of our products and any product candidates for which we may obtain regulatory approval. Sales of any of our products and product candidates, if approved, will depend, in part, on the extent to which the costs of the products will be covered by third-party payors, including government healthcare programs such as Medicare and Medicaid, and private payors, such as commercial health insurers and managed care organizations. Third-party payors determine which drugs they will cover and the amount of reimbursement they will provide for a covered drug. In the U.S., there is no uniform system among payors for making coverage and reimbursement decisions. In addition, the process for determining whether a payor will provide coverage for a product may be separate from the process for setting the price or 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, or formulary, which might not include all of the FDA-approved products for a particular indication.

In order to secure coverage and reimbursement for our products we may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of the product, in addition to the costly studies required to obtain FDA or other comparable regulatory approvals. Even if we conduct pharmacoeconomic studies, our products and product candidates may not be considered medically necessary or cost-effective by payors. Further, a payor's decision to provide coverage for a product does not imply that an adequate reimbursement rate will be approved.

In the past, payors have implemented reimbursement metrics and periodically revised those metrics as well as the methodologies used as the basis for reimbursement rates or rebates, such as average sales price (ASP), average manufacturer price (AMP), and actual acquisition cost. The existing data for reimbursement based on these metrics is relatively limited, although certain states have begun to survey acquisition cost data for the purpose of setting Medicaid reimbursement rates. The Centers for Medicare and Medicaid Services (CMS) surveys and publishes retail pharmacy acquisition cost information in the form of National Average Drug Acquisition Cost files to provide state Medicaid agencies with a basis of comparison for their own reimbursement and pricing methodologies and rates.

Participation in the Medicaid Drug Rebate Program requires us to pay a rebate for each unit of drug reimbursed by Medicaid. The amount of the "basic" portion of the rebate for each product is set by law as the larger of: (i) 23.1% of quarterly AMP, or (ii) the difference between quarterly AMP and the quarterly best price (Best Price), which, in general, represents the lowest price available from the manufacturer to any entity in the U.S. in any pricing structure, calculated to include all applicable sales and associated rebates, discounts and other price concessions. AMP must be reported on a monthly and quarterly basis, and Best Price is reported on a quarterly basis, to CMS, the federal agency that administers the Medicaid Drug Rebate Program. In addition, the rebate also includes the "additional" portion, which adjusts the overall rebate amount upward as an "inflation penalty" when the drug's latest quarter's AMP exceeds the drug's AMP from the first full quarter of sales after launch, adjusted for increases in the Consumer Price Index-Urban. The upward adjustment in the rebate amount per unit is equal to the excess amount of the current AMP over the inflation-adjusted AMP from the first full quarter of sales. The rebate amount is recomputed each quarter based on our report to CMS of current quarterly AMP and Best Price for the relevant drug. On March 11, 2021, President Biden signed the American Rescue Plan Act of 2021 into law, which eliminates the statutory Medicaid drug rebate cap, currently set at 100% of AMP, for single-source and innovator multiple-source drugs, beginning January 1, 2024.

The terms of our participation in the Medicaid Drug Rebate Program require us to report revisions to AMP or Best Price within a period not to exceed 12 quarters from the quarter in which the data was originally due, and CMS may request or require restatements for earlier periods as well. Any such revisions could have the impact of increasing or decreasing our rebate liability for prior quarters, depending on the direction of the revision. The Affordable Care Act made significant changes to the Medicaid Drug Rebate Program, and CMS issued a final regulation, which became effective on April 1, 2016, to implement the changes to the Medicaid Drug Rebate program under the Affordable Care Act. On December 21, 2020, CMS issued a final regulation that (i) modified existing Medicaid Drug Rebate Program regulations to permit reporting multiple Best Price figures with regard to value-based purchasing

arrangements; and (ii) provided definitions for “line extension,” “new formulation,” and related terms with the practical effect of expanding the scope of drugs considered to be line extensions, with such changes taking effect in 2022. Our failure to comply with the aforementioned price reporting and rebate obligations, as well as pharmacy benefit manager “accumulator” programs, could negatively impact our financial results. In addition, statutory and regulatory changes or other agency action regarding the Medicaid Drug Rebate Program could negatively affect our financial results or expand our rebate liability.

Manufacturers have obligations to report the ASP to the Medicare Program as a part of the agreement to participate in the Medicaid Drug Rebate Program. For calendar quarters beginning January 1, 2022, manufacturers will need to report the ASP for certain drugs under the Medicare program regardless of whether they participate in the Medicaid Drug Rebate Program. Statutory or regulatory changes or CMS guidance could affect the ASP for products and the resulting Medicare payment rate, and could negatively affect results of operations.

Federal law requires that any manufacturer that participates in the Medicaid Drug Rebate Program also participate in the 340B Program in order for federal funds to be available for the manufacturer's drugs under Medicaid and Medicare Part B. The 340B Program, which is administered by the Health Resource and Services Administration (HRSA) requires participating manufacturers to agree to charge statutorily defined covered entities no more than the 340B "ceiling price" for the manufacturer's covered outpatient drugs. These 340B covered entities include a variety of community health clinics and other entities that receive health services grants from the Public Health Service, as well as hospitals that serve a disproportionate share of low-income patients. The 340B ceiling price is calculated using a statutory formula, which is based on the AMP and rebate amount for the covered outpatient drug as calculated under the Medicaid Drug Rebate Program. Any changes to the definition of AMP and the Medicaid rebate amount under federal legislation could affect our 340B ceiling price calculations and negatively impact our results of operations. HRSA issued a final regulation regarding the calculation of the 340B ceiling price and the imposition of civil monetary penalties on manufacturers that knowingly and intentionally overcharge covered entities, which became effective on January 1, 2019. It is currently unclear how HRSA will apply its enforcement authority under the regulation. HRSA also has implemented a ceiling price reporting requirement related to the 340B Program under which we are required to report 340B ceiling prices to HRSA on a quarterly basis, and HRSA then publishes that information to covered entities. Moreover, under a final regulation effective January 13, 2021, HRSA newly established an administrative dispute resolution, or ADR, process for claims by covered entities that a manufacturer has engaged in overcharging, and by manufacturers that a covered entity violated the prohibitions against diversion or duplicate discounts. Such claims are to be resolved through an ADR panel of government officials rendering a decision that could be appealed only in federal court. An ADR proceeding could subject us to onerous procedural requirements and could result in additional liability. In addition, legislation may be introduced that, if passed, would further expand the 340B Program to additional covered entities or would require participating manufacturers to agree to provide 340B discounted pricing on drugs used in an inpatient setting.

In the U.S. Medicare program, outpatient prescription drugs may be covered under Medicare Part D. Medicare Part D is a voluntary prescription drug benefit, through which Medicare beneficiaries may enroll in prescription drug plans offered by private entities for coverage of outpatient prescription drugs. Part D plans include both stand-alone prescription drug benefit plans and prescription drug coverage as a supplement to Medicare Advantage plans provided for under Medicare Part C.

Coverage and reimbursement for covered outpatient drugs under Part D are not standardized. Part D prescription drug plan sponsors are not required to pay for all covered Part D drugs, and each drug plan can develop its own drug formulary that identifies which drugs it will cover and at what tier or level. Any formulary used by a Part D prescription drug plan must be developed and reviewed by a pharmacy and therapeutic committee. Although Part D prescription drug formularies must include drugs within each therapeutic category and class of covered Part D drugs, they have some flexibility to establish those categories and classes and are not required to cover all of the drugs in each category or class. Medicare Part D prescription drug plans may use formularies to limit the number of drugs that will be covered in any therapeutic class and/or impose differential cost sharing or other utilization management techniques.

The availability of coverage under Medicare Part D may increase demand for our products and any product candidates for which we receive marketing approval. However, in order for the products that we market to be included on the formularies of Part D prescription drug plans, we likely will have to offer pricing that is lower than the prices we might otherwise obtain. Changes to Medicare Part D that give plans more freedom to limit coverage or manage utilization, and other cost reduction initiatives in the program could decrease the coverage and price that we receive for any approved products and could harm our business.

In addition, manufacturers are required to provide to CMS a 70% discount on brand name prescription drugs utilized by Medicare Part D beneficiaries when those beneficiaries are in the coverage gap phase of the Part D benefit design. Civil monetary penalties can be applied if a manufacturer fails to provide discounts in the amount of 125% of the discount that was due. Congress could enact legislation that sunsets this discount program and replaces it with a new manufacturer discount program.

In order to be eligible to have our products or any future products paid for with federal funds under the Medicaid and Medicare Part B programs, as applicable, and purchased by certain federal agencies and grantees, we also participate in the U.S. Department of Veterans Affairs (VA) Federal Supply Schedule (FSS) pricing program. Under this program, we are obligated to make our "innovator" drugs available for procurement on an FSS contract and charge a price to four federal agencies — the VA, U.S. Department of Defense (DoD) Public Health Service and U.S. Coast Guard — that is no higher than the statutory Federal Ceiling Price (FCP). The FCP is based on the non-federal average manufacturer price (Non-FAMP), which we calculate and report to the VA on a quarterly and annual basis. We also participate in the Tricare Retail Pharmacy program, under which we pay quarterly rebates on utilization of innovator products that are dispensed through the Tricare Retail Pharmacy network to Tricare beneficiaries. The rebates are calculated as the difference between the annual Non-FAMP and FCP.

Pricing and rebate calculations vary across products and programs, are complex, and are often subject to interpretation by us, governmental or regulatory agencies, and the courts. Significant civil monetary penalties can be applied if we are found to have knowingly submitted any false AMP, best price, or Non-FAMP information to the government or fail to submit the required price data on a timely basis. Such conduct also could be grounds for CMS to terminate the Medicaid drug rebate agreement, in which case federal payments may not be available under Medicaid or Medicare Part B for our covered outpatient drugs. Civil monetary penalties could also be applied if we are found to have charged 340B covered entities more than the statutorily mandated ceiling price. In addition, claims submitted to federally-funded healthcare programs, such as Medicare and Medicaid, for drugs priced based on incorrect pricing data provided by a manufacturer can implicate the False Claims Act.

The containment of healthcare costs has become a priority of federal, state and foreign governments, and the prices of drugs have been a focus in this effort. The U.S. government, state legislatures, and foreign governments have shown significant interest in implementing cost-containment programs to limit the growth of government-paid healthcare costs, including price controls, restrictions on reimbursement, and requirements for substitution of generic products for branded prescription drugs. For example, Congress could enact a drug price negotiation program under which the prices for certain high Medicare spend single source drugs would be capped by reference to the non-federal AMP. This or any other legislative change could impact the market conditions for our products. We expect continued scrutiny on government price reporting and pricing more generally from Congress, agencies, and other bodies and are seeing an increase in state interest in price reporting, transparency, and other policies to address drug pricing concerns.

Beginning April 1, 2013, Medicare payments for all items and services, including drugs, were reduced by, on average, 2% per fiscal year under the sequestration (i.e., automatic spending reductions) required by the Budget Control Act of 2011, as amended by the American Taxpayer Relief Act of 2012. Sequestration is currently set at 2% and will increase to 2.25% for the first half of fiscal year 2030, to 3% for the second half of fiscal year 2030, and to 4% for the remainder of the sequestration period that last through the first six months of fiscal year 2031. As long as these cuts remain in effect, they could adversely impact payment for any of our products that are reimbursed under Medicare. Other legislative or regulatory cost containment legislation could have a similar effect.

Further, the Affordable Care Act may reduce the profitability of drug products. It expanded manufacturers' rebate liability under the Medicaid program from fee-for-service Medicaid utilization to include the utilization of Medicaid managed care organizations as well, and increased the minimum Medicaid rebate due for most innovator drugs. The Affordable Care Act and subsequent legislation also changed the definition of AMP. On February 1, 2016, CMS issued final regulations to implement the changes to the Medicaid Drug Rebate Program under the Affordable Care Act. These regulations became effective on April 1, 2016.

On August 16, 2022, President Biden signed into law the Inflation Reduction Act of 2022, or the IRA, which, among other things, establishes a Medicare Part B inflation rebate scheme, under which, generally speaking, manufacturers will owe rebates if the average sales price of a Part B drug increases faster than the pace of inflation. Failure to timely pay a Part B inflation rebate is subject to a civil monetary penalty. The IRA also establishes a Medicare Part D inflation rebate scheme, under which, generally speaking, manufacturers will owe rebates if the AMP of a Part D drug increases faster than the pace of inflation. The IRA also creates a drug price negotiation program under which the prices for Medicare units of certain high Medicare spend drugs and biologics without generic or biosimilar competition will be capped by reference to, among other things, a specified non-federal AMP,

starting in 2026. Failure to comply with requirements under the drug price negotiation program is subject to an excise tax and/or a civil monetary penalty. The IRA further makes changes to the Medicare Part D benefit, including a limit on annual out-of-pocket costs, and a change in manufacturer liability under the program that could negatively affect the profitability of our products. Failure to pay a discount under this new program will be subject to a civil monetary penalty. Congress continues to examine various policy proposals that may result in pressure on the prices of prescription drugs in the government health benefit programs. The IRA or other legislative change could impact the market conditions for our products. Payment methodologies may be subject to changes in healthcare legislation and regulatory initiatives as well. For example, CMS may develop new payment and delivery models, such as bundled payment models.

The Affordable Care Act requires pharmaceutical manufacturers of branded prescription drugs to pay a branded prescription drug fee to the federal government. Each such manufacturer pays a prorated share of the branded prescription drug fee of $2.8 billion in fee year 2020 and subsequent fee years, based on the dollar value of its branded prescription drug sales to certain federal programs identified in the law. The Affordable Care Act also expanded the Public Health Service's 340B Program to include additional types of covered entities. Substantial new provisions affecting compliance have also been enacted, which may affect our business practices with healthcare practitioners. It appears likely that the Affordable Care Act will continue the pressure on pharmaceutical pricing, especially under the Medicare and Medicaid programs, and may also increase our regulatory burdens and operating costs.

Additional legislative changes, regulatory changes and judicial challenges related to the Affordable Care Act remain possible, as discussed above under the heading "U.S. Healthcare Reform." In addition, there likely will continue to be proposals by legislators at both the federal and state levels, regulators, and third-party payors to contain healthcare costs. Thus, even if we obtain favorable coverage and reimbursement status for our products and any product candidates for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

Additional information regarding these programs is discussed under the risk factor "*If we fail to comply with our reporting and payment obligations under the Medicaid drug rebate program, or other governmental pricing programs, we could be subject to additional reimbursement requirements, penalties, sanctions and fines which could have a material adverse effect on our business, financial condition, results of operations and growth prospects*" in the "Risk Factors" section of this Annual Report on Form 10-K.

Healthcare Fraud and Abuse Laws

In addition to FDA restrictions on marketing of pharmaceutical products, our business is subject to healthcare fraud and abuse regulation and enforcement by both the federal government and the states in which we conduct our business. These laws include, but are not limited to, the following:

- The federal Anti-Kickback Statute prohibits, among other things, knowingly and willfully offering, paying, soliciting or receiving remuneration, directly or indirectly, in cash or in kind, to induce or in return for purchasing, leasing, ordering or arranging for or recommending the purchase, lease or order of any healthcare item or service reimbursable, in whole or in part, under Medicare, Medicaid or other federally financed healthcare programs. This statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on one hand and prescribers, purchasers, and formulary managers on the other. A violation of the Anti-Kickback Statute may be established without proving actual knowledge of the statute or specific intent to violate it. In addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal civil False Claims Act. Violations of the federal Anti-Kickback Statute are punishable by imprisonment, criminal fines, damages, civil monetary penalties, and exclusion from participation in federal healthcare programs. Although there are a number of statutory exceptions and regulatory safe harbors protecting certain common activities from prosecution, the exceptions and safe harbors are drawn narrowly and practices that involve remuneration intended to induce prescribing, purchasing, or recommending pharmaceuticals, including certain discounts, or engaging such individuals as consultants, speakers or advisors, may be subject to scrutiny if they do not fit squarely within the exception or safe harbor. Our practices may not in all cases meet all of the criteria for safe harbor protection from anti-kickback liability. Moreover, there are no safe harbors for many common practices, such as educational and research grants, charitable donations, product support and patient assistance programs. Arrangements that implicate the Anti-Kickback Statute and do not fit within an exception or safe harbor are reviewed on a case-by-case basis to determine whether, based on the facts and circumstances, they violate the statute.

- The federal civil False Claims Act prohibits any person from, among other things, knowingly presenting, or causing to be presented, a false or fraudulent claim for payment of government funds, or knowingly making, using, or causing to be made or used, a false record or statement material to an obligation to pay money to the government or knowingly concealing or knowingly and improperly avoiding, decreasing, or concealing an obligation to pay money to the U.S. federal government. Actions under the False Claims Act may be brought by private individuals known as qui tam relators in the name of the government, and who may share in any monetary recovery. In recent years, several pharmaceutical and other healthcare companies have faced enforcement actions under the False Claims Act for, among other things, providing free product to customers with the expectation that the customers would bill federal programs for the product, and other interactions with prescribers and other customers including interactions that may have affected customers' billing or coding practices on claims submitted to the federal government. Other companies have faced enforcement actions for causing false claims to be submitted because of the company's marketing the product for unapproved, and thus non-reimbursable, uses. Federal enforcement agencies also have shown increased interest in pharmaceutical companies' product and patient assistance programs, including reimbursement and co-pay support services, and a number of investigations into these programs have resulted in significant civil and criminal settlements.
- The Health Insurance Portability and Accountability Act of 1996 and its implementing regulations (collectively, HIPAA), prohibits, among other things, knowingly and willfully executing a scheme to defraud any healthcare benefit program, including private third-party payors. HIPAA also prohibits knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement or representation, or making or using any false writing or document knowing the same to contain any materially false, fictitious or fraudulent statement or entry in connection with the delivery of or payment for healthcare benefits, items or services. HIPAA also imposes requirements relating to the privacy, security and transmission of individually identifiable health information. HIPAA imposes privacy and security obligations on covered entity health care providers, health plans, and health care clearinghouses, as well as their "business associates" – certain persons or entities that create, receive, maintain, or transmit protected health information in connection with providing a specified service or performing a function on behalf of a covered entity. HIPAA has four tiers of civil monetary penalties and grants state attorneys enforcement authority. The Department of Justice also may impose criminal penalties. Additionally, certain states have adopted comparable privacy and security laws and regulations, some of which may be more stringent than HIPAA, and numerous federal and state laws, including state data breach notification laws, state health information privacy laws, and federal and state consumer protection laws, including, for example, Section 5 of the Federal Trade Commission Act, as amended, and the California Consumer Privacy Act (CCPA), govern the collection, use, and disclosure and protection of certain health-related and other personal information.
- Although we are not directly subject to HIPAA, other than potentially with respect to providing certain employee benefits, we may obtain health information from third parties that are subject to privacy and security requirements under HIPAA, and other privacy and data security and consumer protection laws, and we could potentially be subject to criminal penalties if we, our affiliates, or our agents knowingly receive individually identifiable health information maintained by a HIPAA-covered entity in a manner that is not authorized or permitted by HIPAA, and could also potentially be subject to other civil and/or criminal penalties if we obtain, use or disclose information in a manner not permitted by other privacy and data security and consumer protection laws.
- The majority of states also have statutes or regulations similar to the federal anti-kickback and false claims laws, which apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor. Several states now require pharmaceutical companies to report expenses relating to the marketing and promotion of pharmaceutical products in those states and to report gifts and payments to individual health care providers in those states. Some of these states also prohibit certain marketing-related activities including the provision of gifts, meals, or other items to certain health care providers. Other states have laws requiring pharmaceutical sales representatives to be registered or licensed, and still others impose limits on co-pay assistance that pharmaceutical companies can offer to patients. In addition, several states require pharmaceutical companies to implement compliance programs or marketing codes.
- The Physician Payments Sunshine Act, implemented as the Open Payments program, and its implementing regulations, 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 CMS information related to direct or indirect payments and other transfers of value to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), other healthcare professionals (such as physician assistants and nurse practitioners) and teaching hospitals, as well as ownership and investment interests held in the company by physicians and their immediate family members.

Compliance with such laws and regulations requires substantial resources. Because of the breadth of these various fraud and abuse laws, it is possible that some of our business activities could be subject to challenge under one or more of such laws. Such a challenge could have material adverse effects on our business, financial condition and results of operations. In the event governmental authorities conclude that our business practices do not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations, they may impose sanctions under these laws, which are potentially significant and may include civil monetary penalties, damages, exclusion of an entity or individual from participation in government health care programs, criminal fines and imprisonment, additional reporting requirements if we become subject to a corporate integrity agreement or other settlement to resolve allegations of violations of these laws, as well as the potential curtailment or restructuring of our operations. Even if we are not determined to have violated these laws, government investigations into these issues typically require the expenditure of significant resources and generate negative publicity.

Healthcare Privacy Laws

We may be subject to laws and regulations covering data privacy and the protection of health-related and other personal information. The legislative and regulatory landscape for privacy and data protection continues to evolve, and there has been an increasing focus on privacy and data protection issues which may affect our business. Numerous federal and state laws and regulations, including state security breach notification laws, state health information privacy laws and federal and state consumer protection laws, govern the collection, use, disclosure, and protection of personal information. Failure to comply with such laws and regulations could result in government enforcement actions and create liability for us (including the imposition of significant penalties), private litigation and/or adverse publicity that could negatively affect our business. In addition, healthcare providers who prescribe our products and research institutions we collaborate with are subject to privacy and security requirements under HIPAA.

Foreign Corrupt Practices Act

In addition, the U.S. Foreign Corrupt Practices Act of 1997 prohibits corporations and their intermediaries from engaging in certain activities to obtain or retain business or to influence a person working in an official capacity. It is illegal to pay, offer to pay or authorize the payment of anything of value to any official of another country, government staff member, political party or political candidate in an attempt to obtain or retain business or to otherwise influence a person working in that capacity.

Human Capital

Culture is a critical element in the management of our organization. Our colleagues are focused on driving our business with the Optinose values as the foundation for all our efforts. Our goal is that each colleague feels a deep connection to what they do, loves coming to work and is aligned to our One Mission – to improve lives. Our values of Authenticity, Fearless Conversations, Friendship, Openness, Perseverance and Possibility Thinking guide our actions and decisions.

As of February 20, 2023, we had a total of 141 full-time employees all of whom are in the United States, and no part-time employees. 70% of our employees are in customer-facing roles. Most of our employees have significant prior experience within the pharmaceutical, biotech or device industries.

We continue to focus on building a high performing organization through our emphasis on accountability for results as measured by our performance development process. To help ensure that employees fully understand the Company’s long-term strategy, and how their work contributes to the Company’s success, we utilize a variety of channels to facilitate open and direct communication, including: regular calls with all colleagues, ongoing update communications as needed, regular executive field visits and annual colleague engagement surveys.

We provide our colleagues with competitive salaries and bonuses, opportunities for equity ownership, opportunities for professional development and a robust benefits package. Our compensation programs, including short- and long-term incentives, are designed to enable us to attract and retain individuals whose skills are critical to our current and long-term success. Our compensation philosophy is to ensure that our colleague salaries fall within an

appropriate range around the median of the marketplace for like positions, with differentiation based on performance and contribution, time in position, and criticality of skill set. Within our compensation programs, we also aim to align the interests of our colleagues with those of our shareholders.

We value diversity and are focused on maintaining an inclusive work environment that supports our culture and the needs of the communities we serve and in which we work. Currently, women represent 57% of our colleagues. None of our colleagues are represented by any collective bargaining unit. We believe that we maintain good relations with our colleagues.

As a result of the evolution of the COVID-19 pandemic and the ways in which work has changed, we offer a hybrid work environment in our Yardley headquarters in which colleagues work in the office three days and may work remotely the other two days, if desired. This enables us to provide colleagues with flexibility as well as provide an environment in which creativity and innovation are fostered.

Properties

Our principal office is located in Yardley, Pennsylvania, where we lease approximately 30,000 square feet of office space pursuant to a lease that expires in May 2024. We also lease a facility in Ewing, New Jersey. We believe our facilities are adequate to meet our current needs, although we may seek to negotiate new leases or to re-evaluate the location and amount of space needed for our operations. We believe appropriate alternative space will be readily available on commercially reasonable terms.

Legal Proceedings

We are not a party to any material pending legal proceedings.

Corporate Information

We were incorporated under the laws of the State of Delaware in May 2010. Our corporate office is located at 1020 Stony Hill Road, Suite 300, Yardley, PA 19067. Our telephone number is (267) 364-3500. We maintain an Internet website at www.optinose.com. The information contained on our website is not incorporated by reference into this Form 10-K.

We make available free of charge under the “Investors—SEC Filings” section of our website all of our filings with the SEC, including our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, proxy statements and amendments to such documents, each of which is provided on our website as soon as reasonably practicable after we electronically file or furnish, as applicable, the information with the SEC.

ITEM 1A. RISK FACTORS

Risk Factors

Investing in our common stock involves a high degree of risk. Before deciding to invest in our common stock, you should consider carefully the risks and uncertainties described below, together with general economic and business risks and all of the other information contained in this Annual Report on Form 10-K, including our consolidated financial statements and the related notes and the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations." If any of the following risks actually occur, our business, financial condition, results of operations and prospects could be harmed. In that event, the price of our common stock could decline and you could lose all or part of your investment. This Annual Report on Form 10-K also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in the forward-looking statements as a result of specific factors, including the risks described below. See "Note Regarding Forward-Looking Statements."

Risks Related to Our Financial Position and Capital Resources

We have identified conditions and events that raise substantial doubt about our ability to continue as a going concern.

As of December 31, 2022, we had cash and cash equivalents of $94.2 million and have $130.0 million of outstanding Pharmakon Senior Secured Notes under the A&R Note Purchase Agreement. Our accumulated deficit as of December 31, 2022 was $684.9 million. We have incurred significant net losses since inception and also expect to incur substantial losses in future periods. Our continuation as a going concern is dependent on our ability

to maintain compliance with the financial covenants and other terms under the A&R Note Purchase Agreement, and our ability to generate sufficient cash flows from operations and/or obtain additional capital through equity or debt financings, partnerships, collaborations, or other sources to meet the debt service obligations under our outstanding Pharmakon Senior Secured Notes, including repayment, and to carry out our planned development and commercial activities.

We believe it is probable that we will not achieve the trailing twelve-month minimum consolidated XHANCE net sales and royalties thresholds that we are required to achieve under the A&R Note Purchase Agreement commencing with the period ending March 31, 2024, which will constitute a default under the A&R Note Purchase Agreement if we are unable to obtain a modification or waiver of such minimum consolidated XHANCE net sales and royalties thresholds. In addition, the A&R Note Purchase Agreement contains financial covenants requiring us to maintain at all times a minimum of $30.0 million of cash and cash equivalents. We believe that it is probable that our existing cash and cash equivalents will not be adequate to fund our operations and maintain at least $30.0 million of cash and cash equivalents as required under the A&R Note Purchase Agreement for at least twelve months following the filing of this Form 10-K, which will constitute a default of the liquidity financial covenant under the A&R Note Purchase Agreement if we are unable to obtain additional capital or obtain a waiver or modification to this liquidity covenant prior to falling below such $30.0 million threshold.

Further, the A&R Note Purchase Agreement includes a requirement that, commencing with our financial statements for the year ending December 31, 2023, our annual and quarterly financial statements and any auditor opinion relating thereto may not be subject to any "going concern" uncertainty disclosure. As a general matter, financial statements are subject to a "going concern" uncertainty disclosure if it is probable that the company's available capital is not sufficient to fund its operations and obligations for at least twelve months following the issuance of such financial statements (including obligations that may become due during such twelve month period as a result of some future event). We believe it is unlikely that we will be able comply with this covenant when it becomes effective commencing with our financial statements for the year ending December 31, 2023. Failure to comply with this covenant would also constitute an event of default under the A&R Note Purchase Agreement.

In the event that any one of the foregoing defaults were to occur, the holders of the Pharmakon Senior Secured Notes may declare an event of default under the A&R Note Purchase Agreement and may elect to accelerate the repayment of all unpaid principal, accrued interest and other amounts due under such holders' Pharmakon Senior Secured Notes, which may require us to delay or curtail our operations until we are able to obtain additional capital which may not be available on a timely basis, on favorable terms, or at all, and such capital, if obtained, may not be sufficient to meet our payment obligations or enable us to continue to implement our long-term business strategy. In such an event, our business, prospects, financial condition and results of operations will be materially and adversely affected, and we may be unable to continue as a going concern. These factors raise substantial doubt about our ability to continue as a going concern. If we are unable to continue as a going concern, we may have to liquidate our assets and may receive less than the fair value for such assets or less than the value at which those assets are carried on our financial statements, and it is likely that investors will lose all or a part of their investment. Additionally, if we seek additional financing to fund our debt service obligations and business activities in the future and there remains substantial doubt about our ability to continue as a going concern, investors or other financing sources may be unwilling to provide funding to us on commercially reasonable terms, if at all.

We have incurred significant losses since our inception and anticipate that we will incur continued losses in the future.

We are a specialty pharmaceutical company with a limited operating history. To date, we have focused primarily on XHANCE and ONZETRA Xsail, as well as other product candidates using our proprietary EDS device technology. Since inception, we have incurred significant net losses and expect to continue to incur net losses for the foreseeable future. To date, we have generated revenue from sales of XHANCE since its launch in 2018, as well as from licensing revenues from ONZETRA Xsail and our proprietary EDS device technology. We incurred net losses of $74.8 million and $82.3 million for the years ended December 31, 2022 and 2021, respectively. As of December 31, 2022, we had an accumulated deficit of $684.9 million.

We expect to incur losses for the foreseeable future as we:

- continue to commercialize XHANCE and further scale up external manufacturing and distribution capabilities to commercialize XHANCE or any other product candidate for which we may obtain regulatory approval;
- continue to focus our regulatory compliance efforts on requirements applicable to marketed drugs;
- continue clinical development activities for XHANCE, including mandated post-marketing pediatric studies;

- continue pre-clinical and clinical development activities with respect to our other product candidates;
- seek to discover and develop, in-license or acquire additional products, product candidates and technology;
- maintain, expand and protect our intellectual property portfolio;
- hire additional personnel to continue to support company growth; and
- incur additional legal, accounting and other expenses in operating as a publicly traded commercial-stage company.

Because of the numerous risks and uncertainties associated with drug development and commercialization, we are unable to accurately predict the timing or amount of expenses or when, or if, we will be able to achieve profitability. If we are required by regulatory authorities to perform studies in addition to those expected, or if there are any delays in the initiation and completion of our clinical trials or the development of any of our product candidates, our expenses could increase.

We may never achieve or maintain profitability.

Our ability to become and remain profitable will depend on our ability to generate revenue. Our ability to generate revenue depends upon our ability to successfully commercialize XHANCE and any of our other product candidates, if approved, that we may in-license or acquire in the future, as well as from our ability to successfully out-license any of our products or technology. Our ability to generate revenue from our current or future products and product candidates will depend on a number of factors, including:

- our ability to successfully commercialize XHANCE for the treatment of nasal polyps;
- our ability to obtain regulatory approval for, and successfully commercialize, XHANCE for the treatment of chronic sinusitis;
- our ability to complete and submit applications to, and obtain regulatory approval from, foreign regulatory authorities, if we choose to commercialize XHANCE outside the U.S.;
- the size of the markets in the territories for which we gain regulatory approval;
- the performance of our sales team, in marketing and promoting XHANCE;
- our ability to maintain and further develop a commercial organization capable of sales, marketing and distribution for XHANCE and any of our other product candidates for which we may obtain marketing approval;
- our ability to maintain commercially reasonable agreements with wholesalers, distributors and other third parties in our supply chain;
- our success in establishing a commercially viable price for our products;
- our success in defending against potential generic competition and other developments in our market generally;
- our ability to have commercial quantities of our products manufactured at acceptable cost levels;
- our ability to obtain coverage and adequate reimbursement from third parties, including government payors; and
- our ability to successfully complete development activities, including the necessary clinical trials, with respect to our other product candidates.

XHANCE, as well as any of our other product candidates if approved for commercial sale, may not gain market acceptance or achieve commercial success. Even if we obtain regulatory approval to market XHANCE for the treatment of chronic sinusitis, our future revenues will depend upon our ability to achieve sufficient market acceptance and reimbursement from third-party payors. If our addressable market is not as significant as we estimate or the treatment population is narrowed by competition, physician choice, clinical practice guidelines or utilization management criteria imposed by payors, we may not generate significant revenue from sales of XHANCE. In addition, we would anticipate incurring significant costs associated with commercializing any approved product. We may not achieve profitability. If we are unable to generate enough product revenues to cover our

operating expenses and service our debt, we will not become profitable and may be unable to continue operations without continued funding.

Even if we achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable would depress the value of our company and could impair our ability to raise capital, expand our business, maintain our development efforts, obtain drug approvals, diversify our offerings or continue our operations. A decline in the value of our company could also cause you to lose all or part of your investment.

We will likely require additional capital to fund our operations and, if we fail to obtain necessary financing, we may be unable to continue the commercialization of XHANCE, service and repay our debt and pursue FDA-approval of XHANCE for the treatment of chronic sinusitis.

Our operations have consumed substantial amounts of cash. To date, we have financed our operations primarily through the sale and issuance of common and preferred stock, debt, licensing revenues, XHANCE revenue and research grants. We expect to continue to spend substantial amounts to commercialize XHANCE and pursue FDA- approval of XHANCE for the treatment of chronic sinusitis. As of December 31, 2022, we had cash and cash equivalents of $94.2 million. Although it is difficult to predict our future liquidity requirements, we will likely require additional capital in the future secured through equity or debt financings, partnerships, collaborations, or other sources in order to meet our debt service obligations under our debt, and to carry out our planned development and commercial activities.

Our future funding requirements, both near and long-term, will depend on many factors, including, but not limited to:

- the success of our commercialization of XHANCE for the treatment of nasal polyps including, among other things, patient and physician acceptance of XHANCE and our ability to maintain adequate insurance coverage and reimbursement for XHANCE;
- the outcome, timing and cost of the regulatory approval process of XHANCE for chronic sinusitis by the FDA, including the potential for the FDA to require that we perform more studies and clinical trials than those that we currently expect;
- if XHANCE is approved by the FDA for the treatment of chronic sinusitis, the success of our commercialization of XHANCE for this new indication including, among other things, patient and physician acceptance of XHANCE for this new indication and our ability to obtain adequate insurance coverage and reimbursement for XHANCE for this new indication, and the speed at which we are able to obtain these outcomes, if at all;
- the cost of commercialization activities for XHANCE, including product manufacturing, distribution, marketing and sales;
- net product revenues received from sales of XHANCE;
- the level of co-pay assistance and other patient affordability programs offered for XHANCE;
- our clinical development plans for XHANCE, including our ongoing FDA-mandated post-marketing pediatric study;
- the costs involved in preparing, filing and prosecuting patent applications, and maintaining and enforcing our intellectual property rights;
- the cost of defending intellectual property disputes, including patent infringement actions brought by third parties against us;
- the initiation, progress, timing, costs and results of clinical trials and other research and development related to additional product candidates; and
- the extent to which we in-license, acquire or otherwise partner in the development of other products, product candidates or technologies.

We cannot be certain that additional funding will be available when needed on acceptable terms, or at all. If we are unable to raise additional capital in sufficient amounts, when required or on acceptable terms, we also could be required to (to the extent permissible under the A&R Note Purchase Agreement):

- significantly delay, scale back or discontinue the commercialization of XHANCE and the development and pursuit of FDA-approval of XHANCE for the treatment of chronic sinusitis;
- relinquish or license on unfavorable terms our rights to our product, EDS technologies or other product candidates that we otherwise would seek to develop or commercialize ourselves;
- seek strategic collaborations to assist in the commercialization of XHANCE in the U.S. and other markets at an earlier stage than otherwise would be desirable or on terms that are less favorable than might otherwise be available;
- delay, limit, reduce or terminate the drug development of our current or future product candidates, or seek collaborators for one or more of our current or future product candidates at an earlier stage than otherwise would be desirable or on terms that are less favorable than might otherwise be available; or
- significantly curtail our operations, liquidate our assets or seek bankruptcy.

If we are unable to meet our business objectives in the necessary timeframes or at all, our business would be jeopardized and we may not be able to continue operations.

Additionally, the Note Purchase Agreement contains various covenants that limit our ability to obtain additional capital through the sale, transfer, lease or disposition of our assets, merger, consolidation, the incurrence of additional debt and the granting of certain license rights related to our products, technology and other intellectual property rights. Furthermore, the warrants to purchase shares of our common stock issues in our November 2022 public offering (2022 Warrants) contain anti-dilution provisions which may adversely impact investor interest and participation in future equity financings or make such future equity financings more dilutive as a result of triggering the anti-dilution provisions of the 2022 Warrants or otherwise.

Our failure to comply with the covenants or other terms of the A&R Note Purchase Agreement, including as a result of events beyond our control, could result in a default under the A&R Note Purchase Agreement that could materially and adversely affect the ongoing viability of our business.

Each holder of the Pharmakon Senior Secured Notes may elect to accelerate the repayment of all unpaid principal and accrued interest under such holders' Pharmakon Senior Secured Notes upon consummation of a specified change of control transaction or occurrence of certain events of default (as specified in the A&R Note Purchase Agreement), including, among other things:

- our default in a payment obligation under the Pharmakon Senior Secured Notes;
- our breach of the financial covenants, affirmative covenants, restrictive covenants or other terms of the A&R Note Purchase Agreement, including (i) the trailing twelve-month minimum consolidated XHANCE net sales and royalties covenant, (ii) the requirement to maintain at least $30.0 million of cash and cash equivalents and (iii) the requirement to deliver quarterly and annual financial statements that, commencing with the fiscal period ending December 31, 2023, are not subject to a "going concern" qualification;
- our breach of reporting obligations;
- our failure to properly maintain the collateral;
- any circumstance that could reasonably be expected to have a material adverse effect (as defined in the A&R Note Purchase Agreement) on us;
- certain regulatory and/or commercial actions that cause an ongoing delay in commercialization of XHANCE; and
- certain specified insolvency and bankruptcy-related events.

Subject to any applicable cure period set forth in the Pharmakon Senior Secured Notes, all amounts outstanding with respect to the Pharmakon Senior Secured Notes (principal and accrued interest), as well as any applicable prepayment premiums or interest "make-whole" payments, would become due and payable immediately upon an event of default and shall be subject to a default interest rate of an additional 3%. Our assets or cash flow may not be sufficient to fully repay our obligations under the Pharmakon Senior Secured Notes if the obligations thereunder

are accelerated upon any events of default. Further, if we are unable to repay, refinance or restructure our obligations under the Pharmakon Senior Secured Notes, or obtain a waiver or modification to the financial covenants or any other terms under the A&R Note Purchase Agreement as may be required in the future, the holders of such Pharmakon Senior Secured Notes could proceed to protect and enforce their rights under the Pharmakon Senior Secured Notes by exercising such remedies (including foreclosure on the assets securing our obligations under the Pharmakon Senior Secured Notes and the A&R Note Purchase Agreement) as are available to the holders thereunder and in respect thereof under applicable law, either by suit in equity or by action at law, or both, whether for specific performance of any covenant or other agreement contained in the Pharmakon Senior Secured Notes or in aid of the exercise of any power granted in the Pharmakon Senior Secured Notes. Any such action would materially and adversely affect the ongoing viability of our business.

In the event that we maintain compliance with the trailing twelve-month minimum consolidated XHANCE net sales and royalties that we are required to meet each quarter, maintain at least $30.0 million of cash and cash equivalents and deliver quarterly and annual financial statements that, commencing with the fiscal period ending December 31, 2023, are not subject to a "going concern" qualification, and maintain compliance with all other terms of the A&R Note Purchase Agreement, in each case, to avoid an acceleration of payments due under the Pharmakon Senior Secured Notes, then we will be required to repay the notes in eight equal quarterly payments of $16.25 million starting on September 30, 2025. The Pharmakon Senior Secured Notes are guaranteed by us, OptiNose AS and certain of our subsidiaries and are secured by a pledge of substantially all of our and their assets. We are required to achieve the following minimum trailing twelve-month XHANCE net sales and royalties under the A&R Note Purchase Agreement (in thousands):

Trailing Twelve-Months Ending	Requirement under the A&R Note Purchase Agreement ($)
September 30, 2022	N/A
December 31, 2022	N/A
March 31, 2023	N/A
June 30, 2023	N/A
September 30, 2023	N/A
December 31, 2023	N/A
March 31, 2024	$82,500
June 30, 2024	90,000
September 30, 2024	102,500
December 31, 2024	110,000
March 31, 2025	115,000
June 30, 2025	120,000
September 30, 2025	125,000
December 31, 2025	130,000
March 31, 2026	135,000
June 30, 2026	140,000
September 30, 2026	145,000
December 31, 2026	150,000
March 31, 2027	155,000
June 30, 2027	160,000
September 30, 2027	165,000

Our A&R Note Purchase Agreement contains restrictions that limit our flexibility in operating our business.

The A&R Note Purchase Agreement contains various covenants that limit our ability to engage in specified types of transactions without our lenders' prior consent. These covenants limit our ability to, among other things:

- sell, transfer, lease or dispose of our assets;
- create, incur or assume additional indebtedness;
- encumber or permit liens on certain of our assets;

- make restricted payments, including paying dividends on, repurchasing or making distributions with respect to our common stock;
- make specified investments (including loans and advances);
- consolidate, merge, sell or otherwise dispose of all or substantially all of our assets;
- enter into certain transactions with our affiliates;
- grant certain license rights related to our products, technology and other intellectual property rights; and
- permit our cash and cash equivalents held in certain deposit accounts to be less than $30.0 million at any time.

In addition, the A&R Note Purchase Agreement provides for, among other things, modifications to the affirmative and negative covenants and events of default, including, without limitation, the removal of certain exceptions to the negative covenants which previously permitted us to enter into certain transactions without the consent of the holders of the Pharmakon Senior Secured Notes, including permitted acquisitions, swap contracts, convertible bonds and a revolving credit facility.

The covenants in our A&R Note Purchase Agreement and related security agreements may limit our ability to take certain actions that may be in our long-term best interests. In the event that we breach one or more covenants, our lenders may choose to declare an event of default and require that we immediately repay all amounts outstanding under the Pharmakon Senior Secured Notes, plus penalties and interest, terminate their commitments to purchase additional Pharmakon Senior Secured Notes and foreclose on the collateral granted to them to secure the Pharmakon Senior Secured Notes. Such repayment could have a material adverse effect on our business, operating results and financial condition.

Provisions of the Pharmakon Senior Secured Notes and the 2022 Warrants provide for certain potential payments to the holders of such securities which could impede a sale of the Company.

Subject to certain exceptions, we are required to make mandatory prepayments of the Pharmakon Senior Secured Notes, with the proceeds of asset sales, extraordinary receipts and prohibited debt issuances, and upon the occurrence of a change of control (as defined in the A&R Note Purchase Agreement). In addition, we may make voluntary prepayments of the Pharmakon Senior Secured Notes, in whole or in part. All mandatory and voluntary prepayments of the Pharmakon Senior Secured Notes are subject to the payment of prepayment premiums as follows: (i) if prepayment occurs on or after September 12, 2022 but prior to September 12, 2023, an amount equal to 1% of the principal prepaid; and (ii) if prepayment occurs on or after September 12, 2023, no prepayment premium is due. We are also required to pay a “make-whole” amount in respect of any principal prepayments (whether mandatory or voluntary) made prior to the 36-month anniversary of the effective date of the A&R Note Purchase Agreement, as follows: (i) for any prepayment date occurring up until and including the 18-month anniversary of the date of the A&R Note Purchase Agreement, the foregone interest from such prepayment date through the 18-month anniversary of such prepayment date; and (ii) for any prepayment after the 18-month anniversary of the date of the A&R Note Purchase Agreement, the foregone interest from such prepayment date through the 3-year anniversary of the date of the A&R Note Purchase Agreement; provided, however, that in no event shall the amount of all make-whole premium payments exceed $24.0 million in the aggregate.

In addition, in the event of a fundamental transaction, as defined in the 2022 Warrants, in certain circumstances a holder of the 2022 Warrants will have the right to require us to repurchase such 2022 Warrants for cash at the Black Scholes Value (as defined in the 2022 Warrants).

These provisions may make it more costly for a potential acquirer to engage in a business combination transaction with us. Provisions that have the effect of discouraging, delaying or preventing a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock and could also affect the price that some investors are willing to pay for our common stock.

Raising additional capital may cause dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our technologies or product candidates.

We do not have any committed external source of funds. Until such a time, if ever, that we can generate substantial revenue, we may seek to raise additional capital through a combination of private and public equity offerings, debt financings, collaborations, strategic alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms may include liquidation or other preferences that adversely affect your rights as a stockholder. Debt financings may be coupled with an equity component, such as warrants to purchase shares, which could also result in dilution of our existing stockholders' ownership. The incurrence of additional indebtedness would result in increased fixed payment obligations and could also result in certain restrictive covenants, such as limitations on our ability to incur additional debt, limitations on our ability to acquire or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business and may result in liens being placed on our assets and intellectual property. If we were to default on such indebtedness, we could lose such assets and intellectual property.

If we raise additional funds through collaborations, or strategic alliance, grants, marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, product candidates or future revenue streams or grant licenses on terms that are not favorable to us or at an earlier stage than would otherwise be desirable.

As noted below, the 2022 Warrants contain price protection anti-dilution provisions. If the exercise price of the 2022 Warrants is reduced as a result of our future issuance of shares or other securities at prices below the exercise price of the 2022 Warrants, this may result in additional warrant exercises and additional dilution to stockholders.

We have a significant number of warrants outstanding that contain anti-dilution provisions that may result in the reduction of their exercise prices in the future.

The 2022 Warrants contain anti-dilution provisions, which provisions require the lowering of the exercise price, as applicable, to the purchase price of future offerings. If in the future we issue or are deemed to issue securities for less than the exercise price of the 2022 Warrants, we may be required to reduce the exercise prices of the 2022 Warrants. During the term that the 2022 Warrants are outstanding, the holders of those securities are given the opportunity to profit from a rise in the market price of our common stock. In addition, we may find it more difficult to raise additional equity capital while these warrants are outstanding. Any future adjustments to the exercise prices of the 2022 Warrants may have a negative impact on the trading price of our common stock. Additionally, raising additional capital with new investors may be difficult as a result of the adjustment feature.

Our ability to use our net operating loss carry forwards and other tax attributes may be limited.

As of December 31, 2022, we had U.S. federal net operating loss (NOL) carry forwards of approximately $335.0 million available to offset future U.S. taxable income and U.S. federal research and development (R&D) tax credits of $2.4 million. While some of our federal NOL carry forwards will carry forward indefinitely, some of our U.S. NOL and credit carry forwards will expire if not utilized with the first expiration occurring in 2030. We also had state NOL carry forwards of $252.3 million as of December 31, 2022. These state NOL carry forwards can only offset income in the same state in which they were generated and thus there is a possibility that they may not be utilized. The carry forward period varies among the states, with the first expiration in 2028. In addition, our Norwegian and UK subsidiaries, had total foreign NOL carry forwards of $9.1 million as of December 31, 2022. These foreign NOL carry forwards do not expire but can only be used to offset profits generated in Norway or the United Kingdom, respectively, and may be limited in use based on the laws of those countries. In order to simplify the corporate structure, our board of directors approved the liquidation of our Norwegian and UK subsidiaries, which is expected to be completed in 2023.

Our U.S. NOL and tax credit carry forwards could expire unused and be unavailable to offset future income tax liabilities because of their limited duration or because of other restrictions under U.S. tax law. Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended (the Code), if a corporation undergoes an “ownership change”, generally defined as a greater than 50% change, by value, in equity ownership during a three-year period, the corporation’s ability to offset pre-change tax attributes, such as NOLs and R&D tax credits, against post-change income or tax may be limited. We have not performed an analysis under Section 382 of the Code and cannot predict or otherwise determine whether utilization of our federal tax attribute carry forwards may be limited. As a result, if we have taxable income in the future, our ability to use existing U.S. NOL and R&D tax credit carry forwards to reduce U.S. taxable income or tax liability may be subject to limitation resulting in increased future tax liabilities. Similar rules at the state level may also limit our ability to use state NOLs. Also, there may be periods

when the use of NOLs is suspended or otherwise limited at the state level, which could accelerate or permanently increase state taxes owed. Furthermore, the losses could expire before we generate sufficient income to utilize them.

We may have ownership changes in the future due to additional changes in our stock ownership which could be outside of our control. If an ownership change occurs and our ability to use our historical net operating loss and tax credit carry forwards is limited, it could adversely impact our future operating results by increasing our tax obligations.

The coronavirus (COVID-19) pandemic has and may continue to adversely affect our business, results of operations and financial condition.

We continue to monitor the effects of the COVID-19 pandemic, which has caused significant disruptions around the world since March 2020. We may continue to experience disruptions as a result of the COVID-19 pandemic that could severely impact our business, including:

- restrictions that remain in some physicians' offices, including not accepting visits from sales representatives or limiting or placing restrictions on visits, which will negatively impact our ability to drive prescription growth from the physicians targeted by our sales representatives;
- a reduced number of patients visiting physicians' offices and changes in insurance coverage or reimbursement levels by governmental authorities, private health insurers and other third-party payors;
- volatile market conditions in the U.S. and around the world, which could harm our business, including our ability to obtain future financing; and
- supply constraints, which could cause us to have an insufficient level of finished product inventories on hand.

The global outbreak of COVID-19 continues to evolve, including with the emergence of new variants, and the extent to which the COVID-19 pandemic may further impact our business, our customers, and the third parties on whom we rely, such as our contract manufacturers, suppliers, PPN partners, wholesalers, distributors, third party logistics, contract research organizations, investigators for our clinical trials and other vendors, will depend on future developments, which are highly uncertain and cannot be predicted with confidence, including the duration of the pandemic, travel restrictions and social distancing in the U.S. and around the world, and the speed with which and the extent to which normal economic and operating conditions resume, among others.

Risks Related to Commercialization of XHANCE

If we are unable to successfully commercialize XHANCE, our business, financial condition and results of operations may be materially adversely affected and the price of our common stock may decline.

Our ability to successfully commercialize XHANCE depends on many factors, including:

- our ability to obtain regulatory approval for XHANCE for a follow-on indication for the treatment of chronic sinusitis;
- our ability to have commercial quantities of XHANCE manufactured at a reasonable cost and with sufficient speed to meet commercial demand;
- the ability of our sales team to effectively market, promote and sell XHANCE;
- our success in educating physicians, patients and caregivers about the benefits, administration and use of XHANCE;
- patient and physician acceptable of XHANCE;
- the availability, perceived advantages, relative cost, relative safety and relative efficacy of competing products;
- the availability of coverage and adequate reimbursement for XHANCE;
- our ability to commercialize XHANCE at a profitable average net revenue per prescription;

- our ability to obtain and maintain contracts with wholesalers, distributors and/or PPN partners on acceptable terms;
- our ability to obtain regulatory approval for XHANCE for a follow-on indication for the treatment of chronic rhinosinusitis;
- the effectiveness of our marketing campaigns;
- our ability to attract and retain qualified pharmaceutical industry personnel;
- a continued acceptable safety profile for XHANCE;
- our ability to obtain and maintain required state licenses to sell XHANCE; and
- our ability to successfully defend any challenges to our intellectual property relating to XHANCE.

It is difficult for us to predict future performance. As we gain additional commercial experience, a number of factors over which we have limited control may contribute to fluctuations in our financial results. We expect that first quarter prescription demand and average net revenue per prescription for XHANCE will be adversely impacted by the annual resetting of patient healthcare insurance plan deductibles and changes in individual patients' healthcare insurance coverage, both of which often occur in January. Additionally, demand has historically been, and we expect will continue to be, impacted by the seasonal variation in patient visits with their doctor and INS market seasonality resulting in reduced XHANCE prescription demand in the third quarter.

Many of these matters are beyond our control and are subject to other risks described elsewhere in this "Risk Factors" section. Accordingly, we cannot assure you that we will be able to successfully commercialize or generate enough revenue from XHANCE to achieve profitability or maintain compliance with minimum trailing twelve-month XHANCE net sales and royalties thresholds under the A&R Note Purchase Agreement. If we cannot do so, or are significantly delayed in doing so, our business, financial condition and results of operations may be materially adversely affected and the price of our common stock may decline.

The commercial success of XHANCE depends upon its acceptance by multiple stakeholders, including physicians, patients and healthcare payors.

The degree of market acceptance of XHANCE depends on a number of factors, including:

- demonstration of clinical safety and efficacy;
- relative convenience and ease of administration;
- pricing and cost-effectiveness;
- availability of alternative treatments and perceived advantages over such alternative treatments;
- the clinical indications for which XHANCE is approved;
- the prevalence and severity of any AEs;
- limitations or warnings contained in the FDA-approved label for XHANCE;
- the effectiveness of our or any future collaborators' sales and marketing strategies;
- consolidation among healthcare providers, which increases the impact of the loss of any relationship;
- our ability to obtain and maintain sufficient third-party coverage and adequate reimbursement;
- adequacy and accessibility of our patient assistance programs; and
- the willingness of patients to pay out-of-pocket in the absence of third-party coverage.

If XHANCE does not achieve an adequate level of acceptance by physicians, patients and healthcare payors, we may not generate sufficient revenue in order to become or remain profitable.

If third-party payors do not reimburse patients for XHANCE or if reimbursement levels are set too low for us to sell XHANCE at a profit, our ability to successfully commercialize XHANCE and our results of operations will be harmed.

Our ability to commercialize XHANCE successfully depends in part on the extent to which coverage and adequate reimbursement for XHANCE will be available in a timely manner and remains available from third-party payors, including governmental healthcare programs such as Medicare and Medicaid, commercial health insurers and managed care organizations. Government authorities and other third-party payors, such as private health insurers and health maintenance organizations, determine which medications they will cover and establish reimbursement levels. Reimbursement decisions by particular third-party payors depend upon a number of factors, including each third-party payor's determination that use of a product is:

- a covered benefit under its health plan;
- appropriate and medically necessary for the specific condition or disease;
- cost effective; and
- neither experimental nor investigational.

Obtaining coverage and reimbursement approval for XHANCE from government authorities or other third-party payors is a time consuming and costly process that could require us to provide supporting scientific, clinical and cost-effectiveness data, including expensive pharmacoeconomic studies beyond the data required to obtain marketing approval, for the use of XHANCE to each government authority or other third-party payor. We may not be able to provide data sufficient to gain or maintain acceptance with respect to coverage and reimbursement from government authorities or other third-party payors.

Third-party payors may deny reimbursement for covered products if they determine that a medical product was not used in accordance with cost-effective diagnosis methods, as determined by the third-party payor, or was used for an unapproved indication. Third-party payors also may refuse to reimburse for procedures and devices deemed to be experimental. Third-party payors may also limit coverage to specific products on an approved list, or formulary, which might not include all of the FDA-approved products for a particular indication.

Third-party payors are increasingly attempting to contain healthcare costs by limiting both coverage and the level of reimbursement for medical products and services. The process for determining whether a payor will provide coverage for a product may be separate from the process for setting the price or reimbursement rate that the payor will pay for the product once coverage is approved. Levels of reimbursement may also decrease in the future, and future legislation, regulation or reimbursement policies of third-party payors may adversely affect the demand for and reimbursement available for XHANCE, which in turn, could negatively impact pricing. Further, payors, including healthcare insurers, pharmacy benefit managers and group purchasing organizations, increasingly seek ways to reduce their costs. Many payors continue to adopt benefit plan changes that shift a greater portion of prescription costs to patients. Such measures include more limited benefit plan designs, higher patient co-pay or co-insurance obligations and limitations on patients' use of commercial manufacturer co-pay assistance programs (including through co-pay accumulator adjustment or maximization programs). Payors also increasingly seek price discounts or rebates in connection with the placement of our products on their formularies or those they manage. Payors may also control costs by imposing restrictions on access to or usage of our products, such as by requiring prior authorizations or "step-edits," and may choose to exclude certain indications for which our products are approved or even choose to exclude coverage entirely. For example, some insurers have established a step-edit system that requires a patient to first use a lower price generic or other alternative product prior to becoming eligible for reimbursement for XHANCE and some insurers also require that a physician attest that XHANCE is being used to treat a patient for an indication for which XHANCE is approved. We estimate that approximately half of the commercially covered lives as of December 31, 2022 are in a plan that requires a prior authorization and most of those prior authorizations request information regarding patient diagnosis and prior use of INS. Some providers may not complete the burdensome administrative process required to demonstrate or document that the patients for whom XHANCE has been prescribed meet the payors' utilization management criteria (i.e., prior authorizations or step-edits) and, as a result, patients will not gain access to XHANCE treatment. We believe increasing rates of enforcement of the utilization management criteria had a negative effect on XHANCE prescription volume growth in 2022 and may continue to effect prescription volume growth in the future. These requirements include physician attestation to a diagnosis of nasal polyps which can be a hurdle for some physicians in our target audience because it is not a diagnosis they make commonly. Further, other patients may obtain coverage for XHANCE but abandon their prescriptions rather than pay their co-pay payment which would result in a significant shortfall in achieving our revenue expectations and negatively impact our business, prospects, results of operations and financial condition.

Significant consolidation in the health insurance industry has resulted in a few large insurers and pharmacy benefit managers exerting greater pressure in pricing and usage negotiations with drug manufacturers, significantly increasing discounts and rebates required of manufacturers and limiting patient access and usage. Further consolidation among insurers, pharmacy benefit managers and other payors, including through integrated delivery systems, would increase the negotiating leverage such entities have over us and other drug manufacturers. Ultimately, further discounts, rebates, coverage or plan changes, restrictions or exclusions as described above could have a material adverse effect on sales of our affected products.

If we are unable to differentiate XHANCE from current and future products or existing methods of treatments, our ability to successfully commercialize XHANCE will be adversely affected.

We are currently commercializing XHANCE for the treatment of nasal polyps and are seeking FDA approval for a follow-on indication of XHANCE for the treatment of chronic rhinosinusitis. Nasonex™ is the only other branded drug therapy approved by the FDA for the treatment of nasal polyps. Nasonex was marketed by Merck until it removal from the prescription market, but remains available over-the-counter without a prescription for other indications. Generic versions of Nasonex™, mometasone furoate monohydrate, continue to be available by prescription. In addition, Beconase AQ™, which is an INS marketed by GlaxoSmithKline, is indicated for the prophylaxis of nasal polyps after surgical resection, while SINUVA™ is a commercially available corticosteroid-eluting implant indicated for the treatment of nasal polyps in adult patients who have had ethmoid sinus surgery that can be placed in the ethmoid sinus under endoscopic visualization for up to 90 days. We are not aware of any drug product approved for the treatment of chronic rhinosinusitis without nasal polyps (or chronic sinusitis). In addition to competition from Nasonex™ and Beconase AQ™, we also need to differentiate XHANCE from other products and treatments identified in current clinical practice guidelines for the treatment of chronic rhinosinusitis with and without nasal polyps. Such products and treatments include the use of nasal rinses, decongestants, over-the-counter and prescription INS products, oral steroids, antibiotics, and sinus surgery and other procedures, including functional endoscopic sinus surgery, balloon sinus dilation and steroid-releasing sinus implants. In addition, several monoclonal antibodies have been approved for the treatment of nasal polyps and are in clinical development for the treatment of chronic rhinosinusitis without nasal polyps. In June 2019, the FDA approved DUPIXENT™ (dupilumab) as an add-on maintenance treatment (to an intranasal steroid) in adult patients with inadequately controlled chronic rhinosinusitis with nasal polyposis. In November 2020, the FDA approved XOLAIR™ add-on maintenance treatment of nasal polyps in adult patients with inadequate response to nasal corticosteroids. In July 2021, the FDA approved NUCALA™ add-on maintenance treatment of chronic rhinosinusitis with nasal polyps in adult patients with inadequate response to nasal corticosteroids. In addition, these monoclonal antibodies are being, or are expected to be, studied as potential treatments for patients with chronic sinusitis without nasal polyps. Lyra Therapeutics is developing corticosteroid-eluting implants as potential treatment for patients with chronic rhinosinusitis. If we are unable to achieve significant differentiation for XHANCE against these other products and treatments, including on the basis of efficacy, safety and tolerability profile, reliability, convenience of administration, price and reimbursement, the opportunity for XHANCE to be commercialized successfully would be adversely affected.

If the market opportunities for XHANCE are smaller than we believe, our revenue may be adversely affected, and our business may suffer.

We believe there is a market opportunity for XHANCE consisting of ENT physicians, allergists and high-decile INS-prescribing primary care physicians that we believe treat an estimated 3.5 million U.S. patients with chronic rhinosinusitis, an estimated 1.2 million of whom have chronic rhinosinusitis with nasal polyps. If we are able to obtain a follow-on indication of XHANCE for the treatment of chronic rhinosinusitis, we intend to broaden, through potential collaborations, our reach and target primary care physicians that we believe treat an additional estimated 6.25 million patients with chronic rhinosinusitis, an estimated one-third of whom have chronic rhinosinusitis with nasal polyps.

Our projections of both the number of people who suffer from chronic rhinosinusitis with and without nasal polyps, as well as the subset of people with these diseases who have the potential to benefit from the use of XHANCE, are based on our beliefs and estimates. These estimates have been derived from a variety of sources, including scientific literature, surveys we commissioned, prescription data or other market research and may prove to be incorrect. Further, new studies may change the estimated incidence or prevalence of chronic rhinosinusitis or nasal polyps. The number of patients may turn out to be lower than expected. Additionally, the potentially addressable patient population for XHANCE may be limited or may not be amenable to treatment with XHANCE, and new patients may become increasingly difficult to identify or gain access to, which would adversely affect our results of operations and our business.

Clinical practice guidelines and recommendations published by various organizations could have significant influence on the use of XHANCE.

Government agencies may promulgate clinical practice guidelines directly applicable to XHANCE. In addition, professional societies, practice management groups, private health and science foundations and organizations involved in various diseases from time to time may also publish guidelines or recommendations to the healthcare and patient communities. Recommendations of government agencies or these other groups or organizations may relate to such matters as usage, dosage, route of administration and use of concomitant therapies. Recommendations or guidelines suggesting the reduced use of XHANCE or the use of competitive or alternative products as the standard of care to be followed by patients and healthcare providers could result in decreased use of XHANCE.

A significant portion of our sales are to a limited number of PPN partners and pharmaceutical wholesalers. Changes in terms required by these PPN partners or wholesalers, disruptions in these relationships or a default could harm our results of operations and financial condition.

Approximately 81% of our XHANCE net revenues during the fiscal year ended December 31, 2022 were to PPN partners. The three leading PPNs accounted for approximately 22% of our XHANCE net revenues. Additionally, approximately 19% of our XHANCE net revenues during the fiscal year ended December 31, 2022 were to the three largest wholesale pharmaceutical distributors, Cardinal Health, McKesson Corporation and AmerisourceBergen Drug Corporation. If any of these PPN partners or wholesalers ceases to purchase our product for any reason, then unless and until the remaining PPN partners or wholesalers increase their purchases of XHANCE or alternative distribution channels are established:

- our commercial operations could be significantly disrupted;
- the availability of XHANCE to patients could be disrupted; and
- we may not achieve sales of XHANCE that we expect, which would decrease our revenues.

We do not require collateral from our wholesalers or PPN partners but rather maintain credit limits and, as a result, we have an exposure to credit risk in our accounts receivable. A default by a large PPN partner or wholesaler could harm our results of operations and financial condition. In the fourth quarter of 2020 and 2021, we established bad debt reserves for two customer with past due balances. Our inability to collect these past due balances or any other balances that may become past due as a result of our extension of credit to customers may harm our results of operations.

We rely on PPN partners for distribution of XHANCE in the U.S., and the failure of those PPN partners to distribute XHANCE effectively would adversely affect sales of XHANCE.

Our reliance on PPN partners for the distribution of XHANCE in the U.S. involves certain risks, including, but not limited to, risks that these PPN partners will:

- not provide us accurate or timely information regarding their inventories, the number of patients who are using our products or complaints about our products;
- not devote the necessary resources, or reduce or discontinue their efforts, to sell or support or otherwise not effectively sell or support our products, including, without limitation, the discontinuation of their refill programs for XHANCE and other patient support services;
- engage in unlawful or inappropriate business practices that result in legal or regulatory enforcement activity which could result in liability to our Company or damage our goodwill with patients; or
- be unable to satisfy financial obligations to us or others.

In the event that any of the PPN partners with whom we work do not fulfill their contractual obligations to us or refuse to or fail to adequately serve patients, or the agreements are terminated without adequate notice, shipments of XHANCE, and associated revenues, would be adversely affected.

If we cannot implement and maintain effective patient affordability programs or improve formulary access for XHANCE in the face of increasing pressure to reduce the price of medications, the adoption of XHANCE by physicians and patients may decline.

We offer patient affordability programs through traditional retail pharmacies and PPN partners to help reduce eligible patients' out-of-pocket costs for XHANCE prescriptions. The utilization of our patient affordability programs will depend on physician and patient awareness and acceptance of the programs. Additionally, certain co-pay assistance benefits are only available through PPN partners. As a result, eligible patients' out-of-pocket cost for XHANCE, when dispensed through PPN partners, may be lower than such costs when XHANCE is dispensed from traditional retail pharmacies. However, to the extent physicians are not willing to prescribe through PPN partners or patients are not willing to receive XHANCE through PPN partners, access to and utilization of XHANCE may decline. In addition, our patient affordability programs are not available to federal health care program (such as Medicare and Medicaid) beneficiaries.

We have also contracted with certain PBMs and other payors to secure formulary status and reimbursement for XHANCE, which generally require us to pay administrative fees and rebates to the PBMs and other payors for qualifying prescriptions. While we have agreements with three of the largest PBMs, as well as other PBMs and payors, in order to facilitate formulary status for XHANCE, we cannot guarantee that we will be able to agree to terms with other PBMs and payors, or that such terms will be commercially reasonable to us. Additionally, our contracts with PBMs and payors are of limited duration and PBMs and payors with whom we contract may seek to renegotiate more favorable terms prior to the expiration of such contracts or in connection with renewals. Despite our agreements with PBMs, the extent of formulary status and reimbursement will ultimately depend to a large extent upon individual healthcare plan formulary decisions. If healthcare plans that contract with PBMs with which we have agreements do not adopt formulary changes recommended by the PBMs with respect to XHANCE, we may not realize the expected access and reimbursement benefits from these agreements. Consequently, the success of our PBM contracting strategy will depend not only on our ability to expand formulary adoption among healthcare plans, but also upon the relative mix of healthcare plans that have PBM-chosen formularies versus custom formularies. If we are unable to realize the expected benefits of our contractual arrangements with the PBMs the adoption of XHANCE by physicians and patients may decline. If we are unable to increase adoption of PPN partners for filling prescriptions of XHANCE by physicians or to secure formulary status and reimbursement through arrangements with PBMs and other payors, particularly with healthcare plans that use custom formularies, our ability to achieve net sales growth for XHANCE would be impaired.

The negative publicity regarding specialty pharmacies or patient support service providers may result in physicians being less willing to send prescriptions to PPN partners or participate in our patient affordability programs, which would limit patient access and utilization of XHANCE.

There has been negative publicity and inquiries from Congress and enforcement authorities regarding the use of specialty pharmacies and patient support services providers and drug pricing. We contract with PPN partners (who may be considered specialty pharmacies) and patient support services providers that provide certain services in connection with our patient affordability programs. These programs are in place to assist in ensuring that when a physician determines XHANCE offers a potential clinical benefit to their patients and they prescribe it for an eligible patient, financial assistance may be available to reduce the patient's out-of-pocket costs. We do not own or possess any option to purchase an ownership stake in any pharmacy that distributes XHANCE or in any patient support services provider, and our relationship with each pharmacy and patient support services provider is non-exclusive and arm's length. All of our sales are processed through pharmacies independent of us. Despite this, the negative publicity and interest from Congress and enforcement authorities regarding specialty pharmacies or patient support services providers may result in physicians being less willing to send prescriptions to PPN partners or participate in our patient affordability programs and thereby limit patient access and utilization of XHANCE.

We may be unable to form and maintain relationships with pharmacies that participate in our PPN and patient affordability programs, which could adversely affect the commercialization of XHANCE and our operating results.

We may encounter difficulty in forming and maintaining relationships with pharmacies that participate in our PPN and patient affordability programs. We currently depend on a limited number of PPN partners to fulfill patient prescriptions. If these PPN partners are unable to process and fulfill the volume of patient prescriptions directed to them, our ability to maintain or increase prescriptions for XHANCE will be impaired. The commercialization of XHANCE and our operating results could be affected should any of the PPN partners choose not to continue to fulfill XHANCE prescriptions or by any adverse market events at any of the PPN partners. For example, pharmacies that dispense XHANCE could lose contracts that they currently maintain with payors or managed care organizations (MCOs), including PBMs. They may be required to abide by certain terms and conditions to maintain access to payors or MCO networks, including terms and conditions that could limit their ability to participate in patient affordability programs like ours. Failure to comply with the terms of their agreements with payors or MCOs could

result in a variety of penalties, including termination of their agreement, which could negatively impact the ability of those pharmacies to dispense XHANCE and collect reimbursement from payors or MCOs for such medicines.

Our patient affordability programs are subject to certain federal and state laws, the violation of which could have an adverse impact on our business and subject us to significant penalties.

Our patient affordability programs may implicate certain federal and state laws related to, among other things, unlawful schemes to defraud, fraud and abuse, excessive fees for services, tortious interference with patient contracts and statutory or common law fraud. We have a comprehensive compliance program in place to address adherence with various laws and regulations relating to the selling, marketing and manufacturing of XHANCE. Despite our compliance efforts, to the extent the patient affordability programs are found to be inconsistent with applicable laws or the pharmacies that participate in our patient affordability programs do not comply with applicable laws or our business rules, we may be required to restructure or discontinue such programs, terminate our relationship with certain pharmacies, or be subject to other significant penalties.

If the cost of maintaining our patient affordability programs increases relative to our sales revenue, we could be forced to reduce or eliminate our financial assistance programs, which could have an adverse effect on our financial results.

If the cost of maintaining our patient affordability programs increases relative to our sales revenues, we could be forced to reduce the amount of patient financial assistance that we offer or otherwise scale back or eliminate such programs, which could in turn have a negative impact on physicians' willingness to prescribe and patients' willingness to fill prescriptions of XHANCE. While we believe that our arrangements with PBMs and other payors will result in broader inclusion of XHANCE on healthcare plan formularies, and lower our cost of providing patient affordability programs, these arrangements generally require us to pay administrative and rebate payments to the PBMs and/or other payors and their effectiveness will ultimately depend to a large extent upon individual healthcare plan formulary decisions that are beyond the control of the PBMs. If our arrangements with PBMs and other payors do not result in increased prescriptions and reductions in our costs to provide our patient affordability programs that are sufficient to offset the administrative fees and rebate payments to the PBMs and/or other payors, our financial results may continue to be harmed.

XHANCE may become associated with undesirable adverse reactions or have other properties that could result in significant negative consequences following regulatory approval.

If we or others identify adverse events associated with XHANCE, a number of potentially significant negative consequences could result, including:

- we may be forced to suspend marketing of XHANCE;
- the FDA may withdraw its approval of XHANCE or impose restrictions on its distribution;
- the FDA may require additional warnings or contradictions in the label that could diminish the usage or otherwise limit the commercial success of XHANCE;
- we may be required to conduct additional post-marketing studies;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of XHANCE.

If the FDA or other applicable regulatory authorities approve generic or similar products that compete with XHANCE, or if the FDA or other applicable regulatory authorities change or create new pathways that may expedite approval of such products, it could decrease our expected sales of XHANCE.

Once an NDA, including a Section 505(b)(2) application, is approved, the product covered thereby becomes a "listed drug" which can, in turn, be cited by potential competitors in support of approval of an ANDA or 505(b)(2) NDA. The FD&C Act, FDA regulations and other applicable regulations and policies provide incentives to manufacturers to create modified, non-infringing versions of a drug to facilitate the approval of an ANDA for generic substitutes. Manufacturers may be able to bring a generic product to market in a much more cost-efficient pathway than we currently anticipate. If the costs involved in bringing such a product to market are significantly less than our costs with respect to the development of XHANCE, companies that produce generic equivalents to XHANCE may be able to offer their products at lower prices. Further, if the timeline for bringing such a product to market is

expedited, companies that produce generic equivalents to XHANCE may compete with XHANCE faster than we currently anticipate. For example, the FDA has communicated a priority to build on initiatives to accelerate generic entry of complex generics, which include locally acting nasal drug products and the FDA has included XHANCE on the updated list of product specific guidances for complex generic drug products that the FDA plans to issue, which may provide clarity for competitors to develop generic products that compete with XHANCE. If the FDA accepts alternatives to comparative clinical endpoint bioequivalence studies for generic versions of XHANCE, we may face generic competition faster than we currently anticipate and a significant percentage of any future sales of XHANCE could be lost to such generic products. In 2019, the FDA published a draft product-specific guidance for 0.05mg/spray fluticasone propionate nasal spray that states that a comparative clinical endpoint bioequivalence study is recommended for a fluticasone propionate nasal spray product because of an inability to adequately characterize drug particle size distribution (PSD) in aerosols and sprays using commonly used analytical methods. However, the draft guidance also provides that if a product's PSD can be accurately measured using a validated analytical method such as morphology-directed Raman spectroscopy or any other advanced methodology, the product's sponsor could submit comparative PSD data as part of their drug characterization within their ANDA application as a potential alternative to a bioequivalence study. Moreover, in addition to generic competition, we could face competition from other companies seeking approval of products that are similar to ours using the Section 505(b)(2) pathway. Such applicants may be able to rely on XHANCE or other approved drug products or published literature to develop drug products that are similar to ours. Furthermore, in 2021 and 2022 we provided units of XHANCE to a generic manufacturer in compliance with the CREATES Act. The introduction of a drug product similar to our products or product candidates could expose us to increased competition, leading to a decrease in sales of XHANCE. Competition that we may face from generic or similar versions of XHANCE could materially and adversely impact our future revenue, profitability, and cash flows.

Even though we have obtained regulatory approval for XHANCE, we still face extensive FDA regulatory requirements and may face future regulatory difficulties.

Even though we have obtained regulatory approval in the U.S. for XHANCE for the treatment of nasal polyps in adults, the FDA and state regulatory authorities may still impose significant restrictions on the indicated uses or marketing of XHANCE, or impose ongoing requirements for potentially costly post-approval studies or post-marketing surveillance. For example, as part of its approval of XHANCE for the treatment of nasal polyps in adults, the FDA is requiring that we conduct a randomized, double-blind, placebo controlled clinical trial in adolescents 12 to 17 years of age with nasal polyposis to assess the safety, efficacy, and pharmacokinetics of XHANCE in this population. We have contracted with various clinical trial sites and continue patient enrollment in this trial. The post-marketing requirement at XHANCE approval was to complete the trial by January 2022 and to submit a final report with respect to the trial by July 2022, however, due to enrollment rates, we have submitted a request to the FDA to extend these deadlines. FDA granted an extension of these milestone dates, and acknowledged revised milestone dates for study completion by October 2022 and final report submission by April 2023. We have submitted an additional request to FDA to extend these deadlines further to allow for completion of ongoing discussions with FDA on partial extrapolation of adult data to the pediatric population. If the FDA declines our request, we may be in violation of this requirement relating to the FDA's approval of our NDA for XHANCE.

We are also subject to ongoing FDA requirements governing the labeling, packaging, storage, distribution, safety surveillance, advertising, promotion, record-keeping and reporting of safety and other post-marketing information. The holder of an approved NDA is obligated to monitor and report AEs and any failure of a product to meet the specifications in the NDA. The holder of an approved NDA must also submit new or supplemental applications and obtain FDA approval for certain changes to the approved product, product labeling or manufacturing process. Advertising and promotional materials must comply with FDA regulations and may be subject to other potentially applicable federal and state laws. The applicable regulations in countries outside the U.S. grant similar powers to the competent authorities and impose similar obligations on companies.

In addition, manufacturers of drug products and their facilities are subject to payment of substantial user fees and continual review and periodic inspections by the FDA and other regulatory authorities for compliance with cGMP regulations and adherence to commitments made in the NDA. Since XHANCE is a combination product, we also need to comply with some of the FDA's manufacturing regulations for devices. In addition to cGMP, the FDA requires that our drug-device combination product comply with the Quality System Regulation (QSR), which sets forth the FDA's manufacturing quality standards for medical devices, and other applicable government regulations and corresponding foreign standards. If we, or a regulatory authority, discover previously unknown problems with XHANCE, such as AEs, of unanticipated severity or frequency, or problems with a facility where the product is manufactured, a regulatory authority may impose restrictions relative to XHANCE or the manufacturing facility, including requiring recall or withdrawal of the product from the market, suspension of manufacturing, or other FDA action or other action by foreign regulatory authorities.

If we fail to comply with applicable regulatory requirements following approval of XHANCE, a regulatory authority may:

- issue a warning letter asserting that we or our manufacturing partners are in violation of the law;
- seek an injunction or impose civil or criminal penalties or monetary fines;
- suspend, modify or withdraw regulatory approval;
- suspend any ongoing clinical trials;
- refuse to approve a pending NDA or a pending application for marketing authorization or supplements to an NDA or to an application for marketing authorization submitted by us;
- seize our product or product candidate; and/or
- refuse to allow us to enter into supply contracts, including government contracts.

Our relationships with physicians, patients, payors and pharmacies in the U.S. are subject to applicable anti-kickback, fraud and abuse laws and regulations. Our failure to comply with these laws could expose us to criminal, civil and administrative sanctions, reputational harm, and could harm our results of operations and financial conditions.

Our current and future operations with respect to the commercialization of XHANCE, as well as potential future development programs, are subject to various U.S. federal and state healthcare laws and regulations. These laws impact, among other things, our proposed sales, marketing, support and education programs and constrain our business and financial arrangements and relationships with third-party payors, healthcare professionals, pharmacies and others who may prescribe, recommend, purchase or provide XHANCE, and other parties through which we market, sell and distribute XHANCE. Finally, our current and future operations are subject to additional healthcare-related statutory and regulatory requirements and enforcement by foreign regulatory authorities in jurisdictions in which we conduct our business. The laws are described in greater detail in the previous section under "Business — Government Regulation — Healthcare Fraud and Abuse Laws," and include, but are not limited to:

- the federal Anti-Kickback Statute, prohibits persons or entities from, among other things, knowingly and willfully soliciting, offering, receiving or paying any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, lease, order, or arranging for or recommending the purchase, lease or order of, any good or service, for which payment may be made, in whole or in part, under federal healthcare programs such as Medicare and Medicaid. 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 civil False Claims Act (which can be enforced through "qui tam," or whistleblower actions, by private citizens on behalf of the federal government) prohibits any person from, among other things, knowingly presenting, or causing to be presented false or fraudulent claims for payment of government funds or knowingly making, using or causing to be made or used, a false record or statement material to an obligation to pay money to the government or knowingly and improperly avoiding, decreasing or concealing an obligation to pay money to the U.S. federal government.
- the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA) imposes criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement, in connection with the delivery of, or payment for healthcare benefits, items or services by a healthcare benefit program, which includes both government and privately funded benefits programs; similar to the U.S. 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.
- numerous federal and state laws and regulations that address privacy and data security, including state data breach notification laws, state health information privacy laws, and federal and state consumer protection laws (e.g., Section 5 of the Federal Trade Commission Act (FTC Act)), govern the collection, use, disclosure and protection of health-related and other personal information, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating relevant compliance

efforts. Compliance with these laws is difficult, constantly evolving, time consuming, and requires a flexible privacy framework and substantial resources. Compliance efforts will likely be an increasing and substantial cost in the future. Federal regulators, state attorneys general, and plaintiffs' attorneys have been and will likely continue to be active in this space.

- a majority of states whom have adopted laws and regulations analogous to federal laws, including state anti-kickback and false claims laws, that may apply to our business practices, including but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by any third-party payor, including private insurers. Other states have adopted laws that, among other things, require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the U.S. federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; and state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information, which requires tracking gifts and other remuneration and items of value provided to healthcare professionals and entities. In addition, some states have laws requiring pharmaceutical sales representatives to be registered or licensed, and still others impose limits on co-pay assistance that pharmaceutical companies can offer to patients.
- the Physician Payments Sunshine Act, implemented as the Open Payments program, and its implementing regulations, 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 CMS information related to direct or indirect payments and other transfers of value to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), other healthcare professionals (such as physician assistants and nurse practitioners) and teaching hospitals, as well as ownership and investment interests held in the company by physicians and their immediate family members.

The shifting commercial compliance environment and the need to build and maintain robust and expandable systems to comply with different compliance or reporting requirements in multiple jurisdictions increase the possibility that a healthcare or pharmaceutical company may fail to comply fully with one or more of these requirements. Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations may involve substantial costs. It is possible that governmental authorities will conclude that our business practices do not comply with applicable fraud and abuse or other healthcare laws and regulations or guidance. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion from government funded healthcare programs, such as Medicare and Medicaid, additional oversight and reporting requirements if we become subject to a corporate integrity agreement or other settlement agreement to resolve allegations of non-compliance with these laws and the curtailment or restructuring of our operations. If any of the physicians or other providers or entities with whom we expect to do business is found not to be in compliance with applicable laws, they may be subject to the same criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs. Even if we are not determined to have violated these laws, government investigations into these issues typically require the expenditure of significant resources and generate negative publicity, which could harm our financial condition and divert resources and the attention of our management from operating our business.

The occurrence of any event or penalty described above may inhibit our ability to commercialize and further develop XHANCE and generate revenues which would have a material adverse effect on our business, financial condition and results of operations.

If we fail to comply with our reporting and payment obligations under the Medicaid Drug Rebate Program, or other governmental pricing programs, we could be subject to additional reimbursement requirements, penalties, sanctions and fines which could have a material adverse effect on our business, financial condition, results of operations and growth prospects.

We participate in the Medicaid Drug Rebate Program, and other governmental pricing programs, and therefore we are obligated to pay certain specified rebates and report pricing information with respect to XHANCE. Pricing and rebate calculations vary across product and programs, are complex and are often subject to interpretation by us, governmental and regulatory agencies and the courts. We cannot assure you that our submissions will not be found by CMS to be incomplete or incorrect. Governmental agencies may also make changes in program interpretations, requirements or conditions of participation, some of which may have implications for amounts previously estimated or paid. The Medicaid rebate amount is computed each quarter based on our submission to CMS of our current

AMP and Best Price for the quarter. If we become aware that our reporting for a prior quarter was incorrect, or has changed as a result of recalculation of the pricing data, we are obligated to resubmit the corrected data for a period not to exceed twelve quarters from the quarter in which the data originally were due, and CMS may request or require restatements for earlier periods as well. Such restatements and recalculations increase our costs for complying with the laws and regulations governing the Medicaid Drug Rebate Program. Any corrections to our rebate calculations could result in an overage or underage in our rebate liability for past quarters, depending on the nature of the correction. Price recalculations also may affect the ceiling price at which we are required to offer our products to certain covered entities, such as safety-net providers, under the Public Health Service's 340B Program and under other similar government pricing programs. These programs are described in greater detail in the previous section under "Business — Government Regulation — Coverage and Reimbursement."

Our failure to comply with our reporting and payment obligations under the Medicaid Drug Rebate Program and other governmental programs could negatively impact our financial results. The issuance of federal regulations and coverage expansion by various governmental agencies relating to the Medicaid Drug Rebate Program has increased and will continue to increase our costs and the complexity of compliance, has been and will continue to be time-consuming to implement, and could have a material adverse effect on our results of operations, particularly if CMS challenges the approach we take in our implementation of federal regulation.

We also are liable for errors associated with our submission of pricing data. In addition to retroactive rebates and the potential for 340B Program refunds, if we are found to have knowingly submitted false AMP or Best Price information to the government, we may be liable for significant civil monetary penalties. Our failure to submit monthly/quarterly AMP and Best Price data on a timely basis also could result in a significant civil monetary penalty per day for each day the information is late beyond the due date. Further, if we are found to have knowingly misclassified a drug (e.g., by knowingly classifying it as a generic drug for Medicaid Drug Rebate Program purposes, which are subject to lower rebates, instead of a single-source or innovator multiple-source drug), we could be subject to civil monetary penalties no greater than two times the difference between the rebates we should have paid and the rebates we actually paid, which penalties are in addition to the penalties discussed previously. Such failures also could be grounds for CMS to terminate our Medicaid drug rebate agreement, pursuant to which we participate in the Medicaid Drug Rebate Program. In the event that CMS terminates our rebate agreement, federal payments may not be available under Medicaid or Medicare Part B for XHANCE. If we are found to have made a misrepresentation in the reporting of our ASP, the Medicare statute provides for significant civil monetary penalties for each misrepresentation for each day in which the misrepresentation was applied.

HRSA issued a final regulation regarding the calculation of the 340B ceiling price and the imposition of civil monetary penalties on manufacturers that knowingly and intentionally overcharge covered entities, which became effective on January 1, 2019. It is currently unclear how HRSA will apply its enforcement authority under the regulation. HRSA also has implemented a ceiling price reporting requirement related to the 340B Program under which we are required to report 340B ceiling prices to HRSA on a quarterly basis, and HRSA then publishes that information to covered entities. Moreover, under a final regulation effective January 13, 2021, HRSA newly established an administrative dispute resolution, or ADR, process for claims by covered entities that a manufacturer has engaged in overcharging, and by manufacturers that a covered entity violated the prohibitions against diversion or duplicate discounts. Such claims are to be resolved through an ADR panel of government officials rendering a decision that could be appealed only in federal court. An ADR proceeding could subject us to onerous procedural requirements and could result in additional liability. In addition, changes to legislation, regulations, or guidance could modify 340B Program compliance or expand discount liability.

Civil monetary penalties can also be applied if we are found to have knowingly and intentionally charged 340B covered entities more than the statutorily mandated ceiling price. A covered entity or association representing covered entities can also bring claims against us through HRSA's 340B ADR process. HRSA could terminate our 340B program Pharmaceutical Pricing Agreement for good cause, which could cause our Medicaid National Drug Rebate Agreement to be terminated, rendering federal funds for our covered outpatient drugs unavailable under Medicaid and Medicare Part B. Finally, we note again that civil monetary penalties could apply if a manufacturer fails to provide discounts under the Medicare Part D coverage gap discount program in the amount of 125% of the discount that was due.

Federal law requires that a company must participate in the U.S. Department of Veterans Affairs (VA) Federal Supply Schedule (FSS) pricing program to be eligible to have its products paid for with federal funds. As part of this program, we are obligated to make XHANCE available for procurement on an FSS contract under which we must

comply with standard government terms and conditions and charge a price that is no higher than the statutory Federal Ceiling Price (FCP) to four federal agencies (VA, U.S. Department of Defense (DOD) Public Health Service, and U.S. Coast Guard). The FCP is based on the Non-Federal Average Manufacturer Price (Non-FAMP), which we calculate and report to the VA on a quarterly and annual basis. If we overcharge the government in connection with our FSS contract or Tricare Retail Pharmacy Agreement, whether due to a misstated FCP or otherwise, we are required to refund the difference to the government. Failure to make necessary disclosures and/or to identify contract overcharges can result in allegations against us under the U.S. civil False Claims Act and other laws and regulations. Unexpected refunds to the government, and responding to a government investigation or enforcement action, would be expensive and time-consuming, and could have a material adverse effect on our business, financial condition, results of operations and growth prospects.

Regulatory approval for any approved product is limited by the FDA to those specific indications and conditions for which clinical safety and efficacy have been demonstrated.

Our promotional materials, statements and training methods must comply with applicable laws and regulations, including FDA's prohibition of the promotion of unapproved, or off-label, use. Physicians may use our products off-label, as the FDA does not restrict or regulate a physician's independent choice of treatment within the practice of medicine. As healthcare professionals frequently prescribe corticosteroids for the treatment of chronic nasal inflammatory diseases, such as chronic rhinosinusitis, doctors often prescribe XHANCE for the treatment of chronic rhinosinusitis and other chronic nasal inflammatory diseases, even though the FDA has granted approval of XHANCE only for the treatment of nasal polyps and we promote the use of XHANCE only for the treatment of nasal polyps. If the FDA determines that our promotional materials, statements or activities constitute promotion of an off-label use, we could be required to modify our promotional materials, statements or training methods or subject us to regulatory or enforcement actions, such as the issuance of an untitled letter, a warning letter, injunction, seizure, civil fine, disgorgement of money, operating restrictions or criminal penalties. We may also be subject to actions by other governmental entities or private parties, such as the U.S. civil False Claims Act, civil whistleblower or "qui tam" actions. It is also possible that other federal, state or foreign enforcement authorities might take action if they consider our promotional materials or activities to constitute promotion of an off-label use, which could result in significant fines or penalties under other statutory authorities. In that event, our reputation could be damaged and market adoption of XHANCE could be impaired.

Even though we have obtained FDA approval for XHANCE in the U.S., we may never obtain approval for or successfully commercialize XHANCE outside of the U.S., which would limit our ability to realize its full market potential.

In order to market XHANCE outside of the U.S., we must obtain marketing authorizations and comply with numerous and varying regulatory requirements of other countries regarding quality, safety and efficacy. Clinical trials conducted in one country may not be accepted by foreign regulatory authorities, and regulatory approval in one country does not mean that regulatory approval will be obtained in any other country. Approval processes vary among countries and can involve additional product testing and validation and additional administrative review periods. Seeking foreign regulatory approval could result in difficulties and costs for us and require additional non-clinical studies or clinical trials, which could be costly and time consuming. Regulatory requirements can vary widely from country to country and could delay or prevent the introduction of XHANCE in those countries. While our management team has experience in obtaining foreign regulatory approvals at other companies, we do not have any product candidates approved for sale in any foreign jurisdiction, and we, as a company, do not have experience in obtaining regulatory approval in international markets. If we fail to comply with regulatory requirements in international markets or to obtain and maintain required approvals, or if regulatory approval in international markets is delayed, our target market for XHANCE will be reduced and we would not be able to realize the full market potential of XHANCE. Furthermore, in addition to the costs to commercialize XHANCE in international markets, the pricing of XHANCE outside of the U.S. at levels acceptable to patients, prescribing physicians or a foreign government payor may be a challenge. If we are unable to achieve, or do not believe we will be able to achieve, acceptable pricing, we may not be able to profitably commercialize XHANCE in international markets.

The Affordable Care Act and any other healthcare reform measures may increase the difficulty and cost for us to commercialize XHANCE and affect the prices we may obtain.

The U.S. and many foreign jurisdictions have proposed and enacted legislative and regulatory changes affecting the healthcare system that could restrict or regulate post-approval activities and affect our ability to profitably sell XHANCE. The U.S. government, state legislatures and foreign governments also have shown significant interest in implementing cost-containment programs to limit the growth of government-paid healthcare costs, including price

controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs.

The Affordable Care Act was intended to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add transparency requirements for the healthcare and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms. These intended reforms are described in greater detail in the previous section under "Business — Government Regulation — U.S. Healthcare Reform."

Among the provisions of the Affordable Care Act that have been implemented since enactment and are of importance to the commercialization of XHANCE are the following:

- an annual, nondeductible fee on any entity that manufactures or imports specified branded prescription drugs or biologic agents;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program;
- expansion of healthcare fraud and abuse laws, including the U.S. civil False Claims Act and the Anti-Kickback Statute, new government investigative powers, and enhanced penalties for noncompliance;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 70% (as of January 1, 2019) point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for a manufacturer's outpatient drugs to be covered under Medicare Part D;
- extension of manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- price reporting requirements for drugs that are inhaled, infused, instilled, implanted, or injected;
- expansion of eligibility criteria for Medicaid programs;
- expansion of the entity types eligible for discounts under the Public Health Service Act's 340B drug pricing program;
- a requirement to annually report certain information regarding drug samples that manufacturers and distributors provide to physicians; and
- a Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research.

Certain provisions of the Affordable Care Act have been subject to judicial challenges, as well as efforts to modify them or alter their interpretation and implementation. For example, on December 22, 2017, the U.S. government signed into law the Tax Act, which includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the “individual mandate.” It is unclear how efforts to modify or invalidate the Affordable Care Act or its implementing regulations, or portions thereof, will affect the Affordable Care Act or our business.

Further, the Bipartisan Budget Act of 2018, among other things, amended the Medicare statute to reduce the coverage gap in most Medicare drugs plans, commonly known as the “donut hole,” by raising the required manufacturer point-of-sale discount from 50% to 70% off the negotiated price effective as of January 1, 2019. Additional legislative changes, regulatory changes, and judicial challenges related to the Affordable Care Act remain possible. We expect that the Affordable Care Act, as currently enacted or as it may be amended in the future, and other healthcare reform measures that may be adopted in the future, could have a material adverse effect on our industry generally and on our ability to maintain or increase sales of XHANCE or to successfully commercialize it.

We also expect that the Affordable Care Act, as well as other healthcare reform measures that have been adopted and may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we receive for XHANCE and could seriously harm our future revenues. Any reduction in reimbursement from Medicare, Medicaid, 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 revenues, attain profitability or successfully commercialize XHANCE.

Product liability lawsuits against us could cause us to incur substantial liabilities and to limit commercialization of XHANCE and any other product candidates that we may develop.

We currently face an inherent risk of product liability exposure related to the testing of our product candidates in human clinical trials and from our commercialization of XHANCE, and this risk will increase as we further commercialize XHANCE and other product candidates that we may develop. We may face product liability claims, regardless of FDA approval for commercial manufacturing and sale as product liability claims may be brought against us by patients who have used XHANCE in any of our clinical trials, future patients, healthcare providers or others using, administering or selling XHANCE and any of our product candidates, if and when approved. On occasion, large judgments have been awarded in class action lawsuits based on drugs that had unanticipated adverse effects. If we cannot successfully defend ourselves against claims that our product candidates or products caused injuries, we could incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for XHANCE;
- injury to our reputation and significant negative media attention;
- termination of clinical trial sites or entire trial programs that we conduct now or in the future relating to XHANCE or our other product candidates;
- withdrawal of clinical trial participants from any current or future clinical trial relating to XHANCE or our other product candidates;
- significant costs to defend the related litigation;
- substantial monetary awards to patients;
- loss of revenue;
- diversion of management and scientific resources from our business operations; and
- an increase in product liability insurance premiums or an inability to maintain product liability insurance coverage.

We currently carry product liability insurance with coverage up to $10.0 million in the aggregate, with a per incident limit of $10.0 million, which may not be adequate to cover all liabilities that we may incur. Further, we may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise. Our inability to maintain sufficient product liability insurance at an acceptable cost could adversely affect our XHANCE product revenues, result in additional liabilities, inhibit the development of XHANCE for additional indications or inhibit the development of our other product candidates. 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 adversely affect our financial condition, results of operations and business.

Additionally, any agreements we may enter into in the future with collaborators in connection with the development or commercialization of XHANCE, our EDS technology or any of our other product candidates may entitle us to indemnification against product liability losses, but such indemnification may not be available or adequate should any claim arise. In addition, several of our agreements require us to indemnify third parties and these indemnifications obligations may exceed the coverage under our product liability insurance policy.

We are subject to intense competition and, if we are unable to compete effectively, our product candidates, if approved, may not reach their commercial potential.

The development and commercialization of new drugs is highly competitive and subject to rapid and significant technological change as research provides a deeper understanding of the pathology of diseases and new technologies and treatments are developed. We face competition with respect to XHANCE from prescription and over-the-counter INS, monoclonal antibodies, oral steroids and other medical management products, and will face competition with respect to any other product candidates that we may seek to develop or commercialize in the future, from many different sources, including large pharmaceutical, biotechnology, specialty pharmaceutical and, to a lesser degree, medical device companies.

The key competitive factors that we expect to impact the commercial success of XHANCE and any other product candidates we may develop are likely to be their efficacy, safety and tolerability profile, reliability, convenience of administration, price and reimbursement. Nasonex™ (mometasone furoate monohydrate) is the only other branded INS drug therapy approved by the FDA for the treatment of nasal polyps. Nasonex was marketed by Merck before being removed from the prescription market, but is available over-the-counter without a prescription for other indications. Generic versions of Nasonex™, mometasone furoate monohydrate, remain available as prescription drugs. In addition, Beconase AQ™, which is an INS marketed by GlaxoSmithKline, is indicated for the prophylaxis of nasal polyps after surgical resection, SINUVA™ is a commercially available corticosteroid-eluting implant indicated for the treatment of nasal polyps in adult patients who have had ethmoid sinus surgery that can be placed in the ethmoid sinus under endoscopic visualization for up to 90 days. To date, four monoclonal antibodies have been studied in nasal polyps: omalizumab, benralizumab, mepolizumab and dupilumab. DUPIXENT™ (dupilumab), which is a monoclonal antibody marketed by Sanofi and Regeneron, was approved by the FDA in 2019 as an add-on maintenance treatment (to an intranasal steroid) in adult patients with inadequately controlled chronic rhinosinusitis with nasal polyposis; XOLAIR™ (omalizumab), which is a monoclonal antibody marketed by Genentech USA, Inc. and Novartis Pharmaceuticals Corporation, was approved by the FDA in 2020 as an add-on maintenance treatment of nasal polyps in adult patients with inadequate response to nasal corticosteroids; and NUCALA™ (mepolizumab), which is a monoclonal antibody marketed by GlaxoSmithKline, was approved by the FDA in 2021 as an add-on maintenance treatment of chronic rhinosinusitis with nasal polyps in adult patients with inadequate response to nasal corticosteroids. Although we are not aware of any drug therapy approved by the FDA or foreign regulatory agencies for the treatment of chronic rhinosinusitis (or chronic sinusitis) without nasal polyps, the above referenced monoclonal antibodies are being, or are expected to be, studied as potential treatments for patients with chronic rhinosinusitis without nasal polyps. In addition, Lyra Therapeutics is developing corticosteroid-eluting implants as potential treatment for patients with chronic rhinosinusitis.

Even though they have not been approved for the treatment of such indications, published clinical practice guidelines do recommend the use of INS products for the treatment of chronic rhinosinusitis with and without nasal polyps in an effort to maximize medical therapy prior to surgical intervention. Currently approved branded INS products include Rhinocort™, marketed by AstraZeneca, Nasacort AQ™, marketed by Sanofi-Aventis, Beconase AQ™, Flonase™ (which contains the same active pharmaceutical ingredient as XHANCE), and Veramyst™, each marketed by GlaxoSmithKline, Qnasl™, marketed by Teva Pharmaceuticals, and Omnaris™ and Zetonna™, each marketed by Sunovion Pharmaceuticals. In lieu of prescription INS nasal sprays, physicians may recommend, and patients may elect to use, over-the-counter INS nasal sprays including over-the-counter products containing fluticasone propionate and mometasone furoate monohydrate.

Most of these INS and monoclonal antibody companies, as well as other potential competitors, have substantially greater financial, technical and human resources than we do and significantly greater experience in the discovery and development of product candidates, obtaining FDA and other regulatory approvals of products and the commercialization of those products.

Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a small number of our competitors. Accordingly, our competitors may be more successful than we may be in obtaining FDA approval of drugs and achieving widespread market acceptance. Our competitors' drugs, or drugs they may develop in the future, may be more effective, or more effectively marketed and sold, than any drug we may commercialize and may render XHANCE or any of our other product candidates we may develop obsolete or non-competitive before we can recover the expenses of developing and commercializing XHANCE or any of our other product candidates. Our competitors may also obtain FDA or other regulatory approval of products more rapidly than expected or may obtain better or preferred market access by offering large rebates to payors or by other means. We may not have accurately or completely predicted the development of new and improved or low-cost surgical interventions, alternative medical therapies or other market-disrupting events. If we are unable to manufacture, distribute, stimulate demand reaching the predicted market share, overcome barriers to access or otherwise effectively commercialize the product, all of which factors may be influenced by current or future competition, then our opportunity to generate revenue from the sale of XHANCE or any of our other product candidates, if approved, will be compromised.

Risks Related to Clinical Development and Regulatory Approval of XHANCE for the Treatment of Sinusitis and Our Other Product Candidates

The design and execution of clinical trials to support FDA-approval of XHANCE for the treatment of chronic sinusitis is subject to substantial risk and uncertainty.

We have conducted a clinical program to support a follow-on indication of XHANCE for the treatment of chronic sinusitis. Although the term chronic rhinosinusitis is often used in medical literature and medical practice, the FDA did not historically recognize chronic rhinosinusitis as an indication for drug development purposes. Instead, the FDA recognized "chronic sinusitis" and "nasal polyps" as indications for drug development purposes rather than the terminology "chronic rhinosinusitis with or without nasal polyps." Recently, the FDA has approved drug products for the treatment of chronic rhinosinusitis with nasal polyps and issued a guidance document in November 2021 for clinical trial programs for nasal polyps in which it supports use of the terminology "chronic rhinosinusitis with nasal polyps" instead of "nasal polyps" and "chronic rhinosinusitis without nasal polyps" instead of "chronic sinusitis". In addition, in January 2023, at the request of the FDA, the indication statement for XHANCE was changed from "the treatment of nasal polyps" to "the treatment of chronic rhinosinusitis with nasal polyps" to conform to the FDA's current labeling terminology and not as a result of additional clinical data.

In February 2022, we submitted a prior approval efficacy supplement under our currently approved 505(b)(2) NDA for a follow-on indication for XHANCE for the treatment of chronic rhinosinusitis. However, as a result of the FDA's evolving view on terminology for nasal polyps, it is uncertain whether the phase 3 clinical trial program that we have conducted for XHANCE would support a follow-on indication for the "treatment of chronic sinusitis," the "treatment of chronic rhinosinusitis" or the "treatment of chronic rhinosinusitis without nasal polyps" or other similar terminology. It is our belief that these variations in terminology are synonymous from a promotional perspective. Furthermore, because there is no FDA-approved product for the treatment of chronic rhinosinusitis (or the treatment of chronic rhinosinusitis or chronic sinusitis), we believe there is substantial risk and uncertainty in planning and conducting adequate clinical trials to meet FDA requirements to support approval for this indication.

Generally, the FDA requires, among other things, that safety and efficacy be established in two adequate and well-controlled studies in the target indication. We designed and conducted the ReOpen program to include chronic sinusitis patients that had objectively verified sinus disease as measured by CT scan. In ReOpen1, we enrolled 205 subjects with chronic sinusitis with nasal polyps and 122 subjects with chronic sinusitis without nasal polyps. In ReOpen2, we only enrolled subjects with chronic sinusitis without nasal polyps. In the ReOpen1 total patient population, we demonstrated a statistically significant benefit for both primary endpoints, composite symptom relief and change in inflammation inside the sinus cavities, as measured by the change in average of percentages of volume occupied by disease (APOV). In addition, although ReOpen1 was not powered to demonstrate statistical significance in either endpoint for the subgroup of patients with chronic sinusitis without nasal polyps, we demonstrated statistical significance for the composite symptom relief endpoint within this subgroup, but not APOV. In ReOpen2, in which only patients with chronic sinusitis without nasal polyps were enrolled, we demonstrated statistically significant benefit in both the composite symptom relief and APOV endpoints.

If the FDA does not find the results of the ReOpen studies to be adequate to sufficiently demonstrate safety and efficacy of XHANCE for the treatment of chronic rhinosinusitis, we may not be successful in obtaining FDA approval for the follow-on indication without having to conduct additional trials. If we do not obtain a follow-on indication for the treatment of chronic rhinosinusitis, our promotion of XHANCE will be limited to nasal polyps, which would limit our potential sales of XHANCE, in which case our business, prospects, financial condition and results of operations will be materially and adversely affected, and we may be unable to maintain compliance with the financial and liquidity covenants of the A&R Note Purchase Agreement or continue as a going concern.

The clinical and regulatory approval processes of the FDA are lengthy, time consuming and inherently unpredictable, and if we are ultimately unable to obtain regulatory approval for our product candidates, our business may 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 FDA. 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.

Our product candidates could fail to receive regulatory approval for many reasons, including the following:

- the FDA may not accept our NDA filing or prior approval efficacy supplement;
- the FDA may disagree with the design, scope or implementation of our clinical trials;
- we may be unable to demonstrate to the satisfaction of the FDA that a product candidate is safe and effective for its proposed indication;
- we may be unable to demonstrate that a product candidate's clinical and other benefits outweigh its safety risks;

- the FDA may disagree with our interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of our product candidates may not be sufficient to support the approval of an NDA or prior approval efficacy supplement;
- the FDA may fail to approve the manufacturing processes or facilities of third-party manufacturers with which we contract for clinical and commercial supplies; and
- the approval policies or regulations of the FDA may change in a manner rendering our clinical data insufficient for approval.

The failure to obtain regulatory approval for a particular product candidate, could substantially harm our business.

Clinical development is a lengthy and expensive process with an uncertain outcome, and results of earlier studies and trials may not be predictive of future trial results. Clinical failure can occur at any stage of clinical development.

Clinical trials are expensive, can take many years to complete and have highly uncertain outcomes. Failure can occur at any time during the clinical trial process as a result of inadequate performance of a drug, inadequate adherence by patients or investigators to clinical trial protocols, investigators failure to comply with applicable laws, or other factors. Drug candidates in later stages of clinical trials may fail to show the desired safety and efficacy traits despite having progressed through earlier clinical trials. A number of companies in the pharmaceutical industry have suffered significant setbacks in advanced clinical trials as a result of a lack of efficacy or adverse safety profiles, despite promising results in earlier trials. Our clinical trials for the follow-on indication of XHANCE for the treatment of chronic rhinosinusitis or our other product candidates may not be successful or may be more expensive or time-consuming than we currently expect. If clinical trials for this or any other product candidate fail to demonstrate safety or efficacy to the satisfaction of the FDA, the FDA may not approve the follow-on indication of XHANCE or any other product candidate and we would not be able to commercialize it, which could substantially harm our business.

Delays in clinical trials are common and have many causes, and any delay could result in increased costs to us and jeopardize or delay our ability to obtain regulatory approval and commence product sales, or our ability to maintain regulatory approval.

Our ongoing and future clinical trials may not begin on time, have an effective design, enroll a sufficient number of patients, timely enroll patients, or be completed on schedule, if at all. We have experienced and may experience further delays in clinical trials of our product candidates or for our FDA-mandated post-marketing pediatric study for XHANCE. Our clinical trials can be delayed or terminated for a variety of reasons, including, but not limited to:

- inability to raise funding necessary to initiate or continue a clinical trial;
- delays in obtaining regulatory approval to commence a clinical trial;
- delays in reaching agreement with the FDA or foreign regulatory authorities on final trial design or the scope of the development program;
- imposition of a clinical hold following an inspection of our clinical trial operations or trial sites by the FDA or foreign regulatory authorities;
- delays in reaching agreement on acceptable terms with prospective contract research organizations (CROs), and clinical trial sites;
- delays in obtaining required IRB approval;
- inability to attract clinical investigators for trials;
- delays in recruiting suitable patients to participate in a clinical trial;
- delays as a result of interim analyses, if any, of clinical trials that indicate futility of the trial or necessitate an increase in the number of patients enrolled in trial;
- patients' delays or failure to complete participation in a clinical trial or return for post-treatment follow-up;
- adverse side effects;

- clinical sites dropping out of a clinical trial;
- time required to add new clinical sites;
- delays by our CMOs to produce and deliver a sufficient supply of clinical trial materials; or
- governmental or regulatory delays, or changes in approval policies or regulations.

For example, previous guidance related to the expected timing of results from our chronic sinusitis trials indicated that top-line results from both trials would be available in the second half of 2021. Pauses in patient enrollment due to factors related to the COVID-19 pandemic had varying effects in different geographies and over time led to a delay in the availability of data from our chronic sinusitis trials.

If clinical trials for our product candidates or for our FDA-mandated post-marketing pediatric study for XHANCE are delayed for any of the above reasons or other reasons, our development costs may increase, our approval process could be delayed or negatively impacted and our ability to commercialize our product or product candidates could be materially harmed.

Risks Related to Our Reliance on Third Parties

If we encounter difficulties in maintaining commercial manufacturing and supply agreements with our third-party manufacturers and suppliers of XHANCE, our ability to commercialize XHANCE would be impaired.

We do not own any manufacturing facilities. We currently have no plans to build our own clinical or commercial scale manufacturing facility. We lack the resources to manufacture and test, on a commercial scale, the technical performance of XHANCE and our other product candidates. We currently rely, and expect to continue to rely, on a limited number of experienced personnel and CMOs and suppliers who assist in the production, assembly, test, supply, storage and distribution of XHANCE and its components for commercial and clinical supplies, and we control only some of the aspects of their activities. We may not be able to maintain terms that are favorable to us. We may not be able to enter into commercial manufacturing and supply agreements with any necessary third parties, should such additional agreements become necessary. If we are unable to enter into such agreements or maintain existing agreements, each on commercially reasonable terms, our ability to commercialize XHANCE would be impaired, and our business, financial condition and results of operations would be materially adversely affected. We have initiated the process of qualifying alternate third-party suppliers for select components of XHANCE. Alternate third party suppliers of XHANCE components are subject to qualification and approval from the FDA which can be a lengthy and expensive process.

If we encounter issues with our contract manufacturers or suppliers, we may need to qualify alternative manufacturers or suppliers, which could impair our ability to sufficiently and timely manufacture and supply XHANCE.

We currently depend on contract manufacturers and suppliers for XHANCE and its components. Although we could obtain each of these components from other third-party suppliers, we would need to qualify and obtain FDA approval for another contract manufacturer or supplier as an alternative source for each such component, which could be costly and cause significant delays. For example, we estimate that it would take at least one year to identify and qualify an alternate contract manufacturer for XHANCE. Additionally, our commercial manufacturing and supply agreements generally include limitations on our ability to utilize alternative manufacturers or suppliers for these components above certain specified thresholds during the terms of the agreements, or may include purchase minimums, which impairs our ability to fully implement any future manufacturing strategies to prevent supply shortages or quality issues.

In addition, some of our suppliers, including our active pharmaceutical ingredient (API) supplier and our contract manufacturers, conduct their manufacturing operations for us at a single facility. Unless and until we qualify additional facilities, we may face limitations in our ability to respond to manufacturing and supply issues. For example, if regulatory, manufacturing or other problems require one of these manufacturers or suppliers to discontinue production at their respective facility, or if the equipment used for the production of XHANCE in these facilities is significantly damaged or destroyed by fire, flood, earthquake, power loss or similar events, the ability of such manufacturer or supplier to provide components or API needed for XHANCE, or to manufacture XHANCE may be significantly impaired. In the event that these parties suffer a temporary or protracted loss of its facility or equipment, we would still be required to obtain FDA approval to qualify a new manufacturer or supplier, as applicable, as an alternate manufacturer or source for the respective component before any components manufactured by such manufacturer or by such supplier could be sold or used.

Any production shortfall that impairs the supply of XHANCE or any of its components could have a material adverse effect on our business, financial condition and results of operations and adversely affect our ability to satisfy demand for XHANCE, which could adversely affect our product sales and operating results materially. For example, the sole supplier of the pump incorporated into XHANCE is discontinuing the manufacture of the pump. As a result, we are currently in the process of evaluating and testing replacement pumps. Although we have purchased excess pumps, any delay in identifying and obtaining FDA-approval of a replacement pump would have a material adverse impact in our ability to supply XHANCE. We have also initiated the process of qualifying alternate third-party suppliers for select components of XHANCE. Alternate third party suppliers of XHANCE components are subject to qualification and approval from the FDA.

If third-party manufacturers, wholesalers, distributors and PPN partners fail to devote sufficient time and resources to XHANCE or their performance is substandard, our product supply may be negatively impacted.

Our reliance on a limited number of manufacturers, wholesalers, distributors and PPN partners exposes us to the following risks, any of which could limit commercial supply of our products, result in higher costs, or result in a loss of potential product revenues:

- our CMOs, or other third parties we rely on, may encounter difficulties in achieving the volume of production needed to satisfy commercial demand, may experience technical issues that impact quality or compliance with applicable and strictly enforced regulations governing the manufacture of pharmaceutical products, and may experience shortages of qualified personnel to adequately staff production operations;
- our wholesalers, distributors and PPN partners could become unable to sell and deliver XHANCE for regulatory, compliance and other reasons;
- our CMOs, wholesalers, distributors and PPN partners could default on their agreements with us to meet our requirements for commercial supply and distribution of XHANCE;
- our CMOs, wholesalers, distributors and PPN partners may not perform as agreed or may not remain in business for the time required to successfully produce, store, sell and distribute our products and we may incur additional cost; and
- if our CMOs, wholesalers, distributors and PPN partners were to terminate our arrangements or fail to meet their contractual obligations, we may be forced to delay or cease sales and ongoing development of XHANCE, or find alternatives that may be more expensive than originally anticipated.

Our reliance on third parties reduces our control over our product candidate development and commercialization activities but does not relieve us of our responsibility to ensure compliance with all required legal, regulatory and scientific standards. For example, the FDA and other regulatory authorities require that our product candidates and any products that we may eventually commercialize be manufactured according to cGMP and similar foreign standards. Any failure by our third-party manufacturers to comply with cGMP or failure to scale up manufacturing processes, including any failure to deliver sufficient quantities of product candidates in a timely manner, could lead to a delay in, or failure to obtain, regulatory approval of any of our product candidates or supply our commercial volume of XHANCE. In addition, such failure could be the basis for the FDA to issue a warning or untitled letter, withdraw approvals for product candidates previously granted to us, or take other regulatory or legal action, including recall or seizure, total or partial suspension of production, suspension of ongoing clinical trials, refusal to approve pending applications or supplemental applications, detention or product, refusal to permit the import or export of products, injunction, imposing civil penalties or pursuing criminal prosecution.We have initiated the process of qualifying an alternate third-party supplier for select components of XHANCE. Alternate third party suppliers of XHANCE components are subject to qualification and approval from the FDA.

Manufacturing issues may arise that could increase product and regulatory approval costs or delay commercialization.

Issues may arise involving product manufacturing of XHANCE or any of our products that may be under development, including but not limited to delays in receiving finished product or product components or raw materials, analytical testing issues, product-packaging problems and equipment malfunctions. These issues may require refinement or resolution in order to continue and not delay the commercialization of XHANCE or development of any of our products under development. In addition, quality issues may arise during commercial manufacturing processes or the scale-up of any of our products that may be under development. Any issues in our product or delivery devices could result in increased scrutiny by regulatory authorities, delays in our regulatory approval process, increases in our operating expenses, shortages in our products available for sales or clinical trial use, decreases in sales to customers, or failure to obtain or maintain approval for our products. We have initiated

the process of qualifying alternate third-party suppliers for select components of XHANCE. Alternate third party suppliers of XHANCE components are subject to qualification and approval from the FDA.

We rely on third parties to conduct our clinical trials. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, or if they terminate their agreement with us, we may not be able to obtain regulatory approval for or commercialize our product candidates.

We have relied upon and plan to continue to rely upon CROs to monitor and manage data for our prospective preclinical and clinical programs. We rely on these parties for execution of our clinical trials, and we control only some of the aspects of their activities. Nevertheless, we are responsible for ensuring that each of our studies and clinical trials are conducted in accordance with the applicable protocol, legal, regulatory and scientific standards, and our reliance on the CROs does not relieve us of our regulatory responsibilities. We and our CROs are required to comply with federal regulations and cGCP, which are international standards meant to protect the rights and health of patients and to define the roles of clinical trial sponsors, advisors and monitors. cGCPs are enforced by the FDA and foreign regulatory authorities in the form of International Conference on Harmonization (ICH) guidelines for all of our product candidates in clinical development. Regulatory authorities enforce cGCP through periodic inspections of trial sponsors, principal investigators and trial sites. If we or any of our CROs fail to comply with applicable cGCP and other regulations, including as a result of any recent changes in such regulations, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials comply with cGCP requirements. While we have agreements governing activities of our CROs, we have limited influence over their actual performance. Failure to comply with applicable regulations in the conduct of the clinical trials for our product candidates may require us to repeat preclinical studies and clinical trials, which would increase our operating expenses and delay the regulatory approval process.

Our CROs are not our employees, and except for remedies available to us under our agreements with such CROs, we cannot control whether or not they devote sufficient time and resources to our ongoing clinical and preclinical programs. If our CROs do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols, regulatory requirements or for other reasons or if we receive additional FDA notices that do require corrective action, our clinical trials may be extended, delayed or terminated and we may not be able to obtain regulatory approval for or successfully commercialize our product candidates. As a result, the commercial prospects for our product candidates would be harmed, our costs could increase substantially and our ability to generate revenue could be delayed.

Switching or adding additional CROs involves additional cost and requires management time and focus. Identifying, qualifying and managing performance of third-party service providers can be difficult, time-consuming and cause delays in our development programs. In addition, there is a natural transition period when a new CRO commences work and the new CRO may not provide the same type or level of services as the original provider. Though we carefully manage our relationships with our CROs, there can be no assurance that we will not encounter challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects. If any of our relationships with our CROs terminate, we may not be able to enter into arrangements with alternative CROs or to do so on commercially reasonable terms. As a result, delays may occur, which can materially impact our ability to meet our desired clinical development timelines.

Because we have relied on third parties, our internal capacity to perform these functions is limited. Outsourcing these functions involves risks that third parties may not perform to our standards, may not produce results in a timely manner or may fail to perform at all. In addition, the use of third-party service providers requires us to disclose our proprietary information to these parties, which could increase the risk that this information will be misappropriated. We currently have a small number of employees, which limits the internal resources we have available to identify and monitor our third-party providers. To the extent we are unable to identify and successfully manage the performance of third-party service providers in the future, our ability to advance our product candidates through clinical trials will be compromised. Though we carefully manage our relationships with our CROs, there can be no assurance that we will not encounter similar challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects.

Risks Related to Our Business Operations and Industry

Our long-term growth depends on our ability to develop and commercialize additional ENT and allergy products.

It is important to our business that we continue to build a more complete product offering within the ENT and allergy markets. Developing additional product candidates is expensive and time-consuming and could divert management's attention away from the commercialization of XHANCE. Even if we are successful in developing additional product candidates, the success of any new product candidates or enhancement to any existing product candidates will depend on several factors, including our ability to:

- properly identify and anticipate ENT and allergy physician and patient needs;
- develop, obtain necessary regulatory clearances or approvals, and introduce new product candidates or product enhancements in a timely manner;
- demonstrate, if required, the safety and efficacy of new product candidates with data from preclinical studies and clinical trials;
- avoid infringing upon the intellectual property rights of third parties;
- comply with all regulations relating to the marketing of new product candidates, including any new or modified EDS technologies; and
- provide adequate training to potential users of our product candidates.

If we are unsuccessful in developing, acquiring or licensing additional product candidates in other areas of the ENT and allergy markets, our ability to gain and maintain profitability may be impaired.

We are subject to risks inherent in foreign operations.

We historically operated portions of our business through our foreign subsidiaries, including through our Norwegian subsidiary, OptiNose AS, which, until 2022, owned a substantial portion of our intellectual property and conducted certain development activities. We also operated a United Kingdom subsidiary, OptiNose UK Ltd.. We are in the process of dissolving both OptiNose AS and OptiNose UK, Ltd. The operations we conduct in other countries, including clinical trials, and the operations conducted by third party suppliers and vendors with whom we do business, are subject to foreign laws. We are subject to a number of risks associated with our international business operations and activities that may increase liability, costs, and require significant management attention. These risks include:

- compliance with the laws of the U.S., the United Kingdom, Norway, and other countries that apply to our international operations, including import and export legislation;
- compliance with foreign data protection laws and regulations in the United Kingdom, Norway and other countries that apply to our international operations;
- the complexities and expenses of administering a business abroad;
- complications in compliance with, and unexpected changes in, tariffs, trade barriers, price and exchange controls and other foreign regulatory requirements, including potential trade conflicts, changes to trade agreements/treaties, and the implementation of trade restrictions;
- instability in economic or political conditions, including inflation, recession and actual or anticipated military conflicts, social upheaval or political uncertainty;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad;
- uncertainties of laws and enforcement relating to the protection of intellectual property or secured technology;
- litigation in foreign court systems;
- language barriers;
- changes in tax laws and regulations in the jurisdictions in which we operate;
- compliance with tax, employment, immigration and labor laws, regulations and restrictions for employees living or traveling abroad;
- difficulties staffing and managing foreign operations; and

- workforce uncertainty in countries where labor unrest is more common than in the U.S.

There can be no assurance that the policies and procedures we implement to address or mitigate these risks will be successful, that our personnel will comply with them or that we will not experience these risks in the future or that they will not have a material adverse effect on our business, results of operations and financial condition.

Our corporate structure and foreign operations may have adverse tax consequences and expose us to additional tax liabilities. In addition, tax returns we file are subject to examination by U.S. federal, state and foreign tax authorities.

Prior to 2023, we had operations in Norway and the UK and a substantial portion of our intellectual property, including certain rights to XHANCE, were owned by OptiNose AS, our Norwegian subsidiary, until 2022. We file tax returns in various jurisdictions and those returns are subject to examination by the tax authorities. During an examination, a tax authority could challenge positions taken on a return. Such a challenge could result in the loss of tax attributes or in the payment of tax which could have an unfavorable impact on our financial condition.

Prior to 2023, we operated pursuant to written intercompany license, service and related agreements that establish prices for intellectual property and for services provided such as production, marketing, management, and technology development activities that are performed by one group company for another group company. The amounts paid under these intercompany agreements are commonly considered for tax purposes as transfer prices. If the affiliated companies are located in different countries, the tax laws and regulations of each country generally require that transfer prices be at arm's length as if between unrelated companies. Our transfer pricing arrangements consider requirements of the jurisdictions in which we operate but are not binding on the tax authorities. If any tax authority is successful in challenging our transfer prices, there could be an increase in taxable income in that jurisdiction which could increase our tax liabilities. Further, if the tax authority in the other country does not agree with the adjustment, both countries could tax the same income, resulting in double taxation.

Any income earned by our foreign subsidiaries, including a portion of the sales of XHANCE in the U.S., may be subject to additional tax liabilities. If our foreign operations generate cash that we want to repatriate to the U.S. or if cash generated by our U.S. operations is not sufficient to fund our U.S. operations, we may face additional tax liabilities in returning or otherwise providing such cash to support our U.S. operations or other strategic opportunities in the U.S. If we are forced to repatriate any foreign-held cash, we could incur a significant tax charge, and our business, operating results or financial condition could be adversely impacted.

If foreign subsidiary income is subject to the Subpart F, investment in US property or global intangible low-taxed income provisions, or similar provisions of the U.S. Internal Revenue Code, collectively referred to in this paragraph as Subpart F, the income may be subject to U.S. corporate income tax even if there is no cash distribution of those earnings to the U.S. For example, Subpart F income includes certain "passive" income, certain income from intercompany transactions, foreign subsidiary income over a legislative threshold or income of a foreign subsidiary which makes an "investment in U.S. property", such as holding the stock in a U.S. corporation. Any foreign subsidiary income subject to the Subpart F provisions would be included in determining U.S. taxable income and potentially subject to federal corporate income tax at rates up to 21%.

Risks Related to Our Intellectual Property

If we are unable to protect our intellectual property rights or if our intellectual property rights are inadequate to protect our technology, XHANCE or our other product candidates, our competitors could develop and commercialize technology similar to ours, and our competitive position could be harmed.

Our commercial success will depend in large part on our ability to obtain and maintain patent and other intellectual property protection in the U.S. and other countries with respect to our proprietary technology and products. We rely on trade secret, patent, copyright and trademark laws, and confidentiality and other agreements with employees and third parties, all of which offer only limited protection. Our strategy is to seek patent protection for XHANCE, our other product candidates and their compositions, their methods of use and processes for their manufacture, and any other aspects of inventions that are commercially important to the development of our business.

The patent prosecution process is expensive and time-consuming, and we and any future licensors and licensees may not be able to apply for or prosecute patents on certain aspects of our product candidates or delivery technologies at a reasonable cost, in a timely fashion, or at all. 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 third parties. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business. It is also possible that we, or any future licensors or licensees, will fail to identify patentable aspects

of inventions made in the course of development and commercialization activities before it is too late to obtain patent protection on them. Therefore, our patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business. It is possible that defects of form in the preparation or filing of our patents or patent applications may exist, or may arise in the future, such as with respect to proper priority claims, inventorship, claim scope or patent term adjustments. If any future licensors or licensees are not fully cooperative or disagree with us as to the prosecution, maintenance, or enforcement of any patent rights, such patent rights could be compromised and we might not be able to prevent third parties from making, using, and selling competing products. If there are material defects in the form or preparation of our patents or patent applications, such patents or applications may be invalid or unenforceable. Moreover, our competitors may independently develop equivalent knowledge, methods, and know-how. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business, financial condition, and operating results.

The patent positions of pharmaceutical companies generally are highly uncertain, involve complex legal and factual questions and have in recent years been the subject of much litigation. As a result, the issuance, scope, validity, enforceability and commercial value of any patents that issue, are highly uncertain. The steps we have taken to protect our proprietary rights may not be adequate to preclude misappropriation of our proprietary information or infringement of our intellectual property rights, both inside and outside the U.S. Further, the examination process may require us to narrow the claims of pending patent applications, which may limit the scope of patent protection that may be obtained if these applications issue. The rights that may be granted under future issued patents may not provide us with the proprietary protection or competitive advantages we are seeking. If we are unable to obtain and maintain patent protection for our technology and products, or if the scope of the patent protection obtained is not sufficient, our competitors could develop and commercialize technology and products similar or superior to ours, and our ability to successfully commercialize our technology and products may be impaired.

As of February 1, 2023, we owned over 60 U.S. issued patents and pending U.S. patent applications. Our issued U.S. patents expire between 2023 and 2036. We do not know whether any of our patent applications will result in issued patents or, if any of our patent applications do issue, whether such patents will protect our technology and drugs, in whole or in part, or whether such patents will effectively prevent others from commercializing competitive technologies and products. There is no guarantee that any of our issued or granted patents will not later be found invalid or unenforceable. Furthermore, as our issued patents expire, the risk that competitors may be able to circumvent our remaining patents by developing similar or alternate technologies or products in a non-infringing manner is increased. Two of our 13 patents listed in the FDA's Orange Book for XHANCE are set to expire from 2023 to 2025. These patents cover certain aspects of our exhalation deliver system technology utilized by XHANCE.

The laws of foreign countries may not protect our rights to the same extent as the laws of the U.S. or vice versa. For example, European patent law restricts the patentability of methods of treatment of the human body more than U.S. law does. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the U.S. and other jurisdictions are typically not published until 18 months after filing or in some cases not at all, until they are issued as a patent. Therefore, we cannot be certain that we were the first to make the inventions claimed in our pending patent applications, that we were the first to file for patent protection of such inventions, or that we have found all of the potentially relevant prior art relating to our patents and patent applications that could invalidate one or more of our patents or prevent one or more of our patent applications from issuing. Even if patents do successfully issue and even if such patents cover our product candidates, third parties may initiate oppositions, interferences, re-examinations, post-grant reviews, inter partes reviews, nullification or derivation actions in court or before patent offices or similar proceedings challenging the validity, enforceability, or scope of such patents, which may result in the patent claims being narrowed or invalidated. For example, the issuance of three of our patents in Europe are subject to opposition proceedings - these patent applications cover certain aspects of our flexible mouthpiece, nosepiece and liquid EDS. Furthermore, even if our patents are not challenged, our patents and patent applications may not adequately protect our intellectual property, provide exclusivity for our product candidates, or prevent others from designing around our claims. Any of these outcomes could impair our ability to prevent competition from third parties.

Furthermore, 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 U.S. 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 drugs, or limit the duration of the patent protection of our technology and drugs. Given the amount of time required for the development, testing and regulatory review of new drug candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a

result, our owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing drugs similar or identical to ours.

We may become involved in lawsuits to protect or enforce our patents or the patents of our licensors, which could be expensive, time consuming and unsuccessful.

Competitors or other third parties may infringe our patents or the patents of any party from whom we may license patents from in the future. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. In a patent litigation in the U.S., 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, for example, lack of novelty, obviousness or non-enablement. 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. The outcome following legal assertions of invalidity and unenforceability during patent litigation is unpredictable. A court may decide that a patent of ours or of any of our future licensors is not valid or is unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. In addition, to the extent that we have to file patent litigation in a federal court against a U.S. patent holder, we would be required to initiate the proceeding in the state of incorporation or residency of such entity. With respect to the validity question, for example, we cannot be certain that no invalidating prior art exists. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated, found unenforceable, or interpreted narrowly, and it could put our patent applications at risk of not issuing. 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 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 one or more of our products or certain aspects of our EDS technology. Such a loss of patent protection could compromise our ability to pursue our business strategy.

Interference proceedings brought by the USPTO may be necessary to determine the priority of inventions with respect to our patents and patent applications or those of our collaborators or licensors. An unfavorable outcome could require us to cease using the technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if a prevailing party does not offer us a license on terms that are acceptable to us. Litigation or interference proceedings may fail and, even if successful, may result in substantial costs and distraction of our management and other employees. We may not be able to prevent, alone, with our licensees, or with any of our future licensors, misappropriation of our proprietary rights, particularly in countries where the laws may not protect those rights as fully as in the U.S. 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. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock.

Moreover, we may be subject to a third-party pre-issuance submission of prior art to the USPTO or other foreign patent offices, 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 drugs and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize drugs without infringing third-party patent rights. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop, or commercialize current or future product candidates.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting and defending patents on XHANCE, our other product candidates and our EDS technology throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the U.S. may be less extensive than those in the U.S. In addition, the laws and practices of some foreign countries do not protect intellectual property rights, especially those relating to life sciences, to the same extent as federal and state laws in the U.S. For example, novel formulations of existing drugs and manufacturing processes may not be patentable in certain jurisdictions, and the requirements for patentability may differ in certain countries, particularly developing countries. Also, some foreign countries, including European Union countries, India, Japan and China, have compulsory licensing laws under which a patent owner may be compelled under certain circumstances to grant licenses to third parties. Consequently, we may have limited remedies if patents are infringed or if we are compelled to grant a license to a third party, and we may not be able to prevent third parties from practicing our inventions in all countries outside the U.S., or from selling or importing products made using our inventions into or

within the U.S. or other jurisdictions. This could limit our potential revenue opportunities. 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 where enforcement is not as strong as that in the U.S. These products may compete with our products in jurisdictions where we do not have any issued patents and our patent claims or other intellectual property rights may not be effective or sufficient to prevent them from competing with us in these jurisdictions. Furthermore, the prevalence of counterfeit medicines, which is one that has been deliberately and fraudulently mislabeled as to its identity and source, is a significant and growing industry-wide issue that could impact our revenue and our reputation for which we may have limited or no recourse. Accordingly, our efforts to enforce intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from our intellectual property. We may not prevail in any lawsuits that we initiate in these foreign countries and the damages or other remedies awarded, if any, may not be commercially meaningful.

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, renewal fees, annuity fees and various other governmental fees on patents and applications are required to be paid to the USPTO and various governmental patent agencies outside of the U.S. in several stages over the lifetime of the patents and applications. The USPTO and various non-U.S. governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process and after a patent has issued. There are situations in which non-compliance 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.

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which could be uncertain and could harm our business.

Our commercial success depends upon our ability to develop, manufacture, market and sell XHANCE and our other product candidates and use our proprietary technologies without infringing the proprietary rights of third parties. While our product candidates are in preclinical studies and clinical trials, we believe that the use of our product candidates in these preclinical studies and clinical trials falls within the scope of the exemptions provided by 35 U.S.C. Section 271(e) in the U.S., which exempts from patent infringement liability activities reasonably related to the development and submission of information to the FDA. As XHANCE and Onzetra Xsail are commercialized and our other product candidates progress toward commercialization, the possibility of a patent infringement claim against us increases. If we use the Section 505(b)(2) regulatory pathway for the follow-on indication of chronic rhinosinusitis or any of our other product candidates it will require us to provide a Paragraph IV certification to the NDA and patent holders of the RLD pursuant to the Hatch-Waxman Act if the RLD is covered by Orange Book-listed patents. If the NDA or patent holder files a patent infringement lawsuit against us within 45 days of its receipt of notice of our certification, the FDA is prevented from approving our Section 505(b)(2) NDA until the earliest of 30 months, expiration of the patents, settlement of the lawsuit or a court decision in the infringement case that is favorable to us. In connection with our submission of the prior approval efficacy supplement for a follow-on indication for XHANCE for chronic rhinosinusitis in February 2023, we provided Paragraph IV certifications to the FDA and notice of such certifications to the NDA and patent holders for the two Orange Book-listed patents for Flovent HFA (one of the RLDs for XHANCE's original NDA). If these NDA and patent holders file a patent infringement action against us within 45 days from receipt of our notice of certification, the potential follow-on indication for XHANCE for chronic rhinosinusitis may be delayed and we may incur significant expenses defending such action. Accordingly, we may invest significant time and expense in the development of our product candidates only to be subject to significant delay and expensive and time-consuming patent litigation before our product candidates may be commercialized. There can be no assurance that our product candidates do not infringe other parties' patents or other proprietary rights and competitors or other parties may assert that we infringe their proprietary rights in any event.

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 product candidates, including interference or derivation proceedings before the USPTO. Numerous U.S. and foreign issued patents and pending patent applications owned by third parties exist in the fields in which we are developing our drug candidates. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future.

If we are found to infringe a third party's intellectual property rights, we could be required to obtain a license from such third party to continue commercializing our product candidates. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if a license can be obtained on acceptable terms,

the rights may be non-exclusive, which could give our competitors access to the same technology or intellectual property rights licensed to us. If we fail to obtain a required license, we may be unable to effectively market product candidates based on our technology, which could limit our ability to generate revenue or achieve profitability and possibly prevent us from generating revenue sufficient to sustain our operations. Alternatively, we may need to redesign our infringing products, which may be impossible or require substantial time and monetary expenditure. Under certain circumstances, we could be forced, including by court order, to cease commercializing our product candidates. In addition, in any such proceeding or litigation, we could be found liable for substantial monetary damages, potentially including treble damages and attorneys' fees, if we are found to have willfully infringed. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could harm our business. Any claims by third parties that we have misappropriated their confidential information or trade secrets could have a similar negative impact on our business.

The cost to us in defending or initiating any litigation or other proceeding relating to patent or other proprietary rights, even if resolved in our favor, could be substantial, and litigation would divert our management's attention. Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could compromise our commercialization efforts, delay our research and development efforts and limit our ability to continue our operations. 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.

Our competitors may be able to circumvent our patents by developing similar or alternative technologies or products in a non-infringing manner.

Our competitors may seek to market generic versions of XHANCE or any other product for which we obtain approval by submitting ANDAs to the FDA or new products that use our approved products as the RLD, in each case where our competitors claim that our patents are invalid, unenforceable or not infringed. Alternatively, our competitors may seek approval to market their own products that are the same as, similar to or otherwise competitive with XHANCE and any future product candidates we may develop. In these circumstances, we may need to defend or assert our patents, by means including filing lawsuits alleging patent infringement requiring us to engage in complex, lengthy and costly litigation or other proceedings. In any of these types of proceedings, a court or government agency with jurisdiction may find our patents invalid, unenforceable or not infringed. We may also fail to identify patentable aspects of our research and development before it is too late to obtain patent protection. Even if we have valid and enforceable patents, these patents still may not provide protection against competing products or processes sufficient to achieve our business objectives. Furthermore, as our issued patents expire, the risk that competitors may be able to circumvent our remaining patents by developing similar or alternate technologies or products in a non-infringing manner is increased. Two of our 13 remaining patents listed in the FDA's Orange Book for XHANCE are set to expire from 2023 to 2025. These patents cover certain aspects of our exhalation deliver system technology utilized by XHANCE.

Changes in either U.S. or foreign patent law or interpretation of such laws could diminish the value of patents in general, thereby impairing our ability to protect our products.

As is the case with other pharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the pharmaceutical industry involve both technological and legal complexity, and it therefore is costly, time-consuming and inherently uncertain. In addition, on September 16, 2011, the Leahy-Smith America Invents Act (the AIA) was signed into law. The AIA includes a number of significant changes to U.S. patent law, including provisions that affect the way patent applications will be prosecuted and may also affect patent litigation.

An important change introduced by the AIA is that, as of March 16, 2013, the U.S. transitioned to a "first-to-file" system for deciding which party should be granted a patent when two or more patent applications are filed by different parties claiming the same invention. A third party that files a patent application in the USPTO after that date, but before us, could therefore be awarded a patent covering an invention of ours even if we had made the invention before it was made by the third party. This will require us to be cognizant going forward of the time from invention to filing of a patent application.

Among some of the other changes introduced by the AIA are changes that limit where a patentee may file a patent infringement suit and providing opportunities for third parties to challenge any issued patent in the USPTO. This applies to all of our U.S. patents, even those issued before March 16, 2013. Because of a lower evidentiary standard necessary to invalidate a patent claim in USPTO proceedings compared to the evidentiary standard in

U.S. federal court, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims that would not have been invalidated if first challenged by the third party as a defendant in a district court action.

Depending on decisions by the U.S. Congress, the federal courts, the USPTO, or similar authorities in foreign jurisdictions, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future.

We may be subject to claims asserting that our employees, consultants, independent contractors and advisors have wrongfully used or disclosed confidential information and/or alleged trade secrets of their current or former employers or claims asserting ownership of what we regard as our own intellectual property.

Although we try to ensure that our employees, consultants, independent contractors and advisors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that these individuals or we have inadvertently or otherwise used or disclosed confidential information and/or intellectual property, including trade secrets or other proprietary information, of the companies that any such individual currently or formerly worked for or provided services to. Litigation may be necessary to defend against these claims. If we fail in 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 defending against such claims, litigation could result in substantial costs and be a distraction to our business.

In addition, while we require our employees and contractors who may be involved in the conception or 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, conceives or develops intellectual property that we regard as our own. The assignment of intellectual property rights may not be self-executing or the assignment agreements may be breached, and we may be forced to bring claims against third parties, or defend claims that they may bring against us, to determine the ownership of what we regard as our intellectual property.

Intellectual property rights do not prevent all potential threats to competitive advantages we may have.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations, and intellectual property rights may not adequately protect our business or permit us to maintain our competitive advantage.

The following examples are illustrative:

- Others may be able to make drug and device components that are the same as or similar to XHANCE and our other product candidates but that are not covered by the claims of the patents that we own or have exclusively licensed;
- We or any of our licensors or collaborators might not have been the first to make the inventions covered by the issued patent or pending patent application that we own or have exclusively licensed;
- We or any of our licensors or collaborators might not have been the first to file patent applications covering certain of our inventions;
- Others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- The prosecution of our pending patent applications may not result in granted patents;
- Granted patents that we own or have licensed may not cover our products or may be held not infringed, invalid or unenforceable, as a result of legal challenges by our competitors;
- With respect to granted patents that we own or have licensed, especially patents that we either acquire or in-license, if certain information was withheld from or misrepresented to the patent examiner, such patents might be held to be unenforceable;
- Patent protection on our product candidates may expire before we are able to develop and commercialize the product, or before we are able to recover our investment in the product;

- Our competitors might conduct research and development activities in the U.S. and other countries that provide a safe harbor from patent infringement claims for such activities, as well as in countries in which we do not have patent rights, and may then use the information learned from such activities to develop competitive products for sale in markets where we intend to market our product candidates;
- We may not develop additional proprietary technologies that are patentable;
- The patents of others may have an adverse effect on our business; and
- We may choose not to file a patent application for certain technologies, trade secrets or know-how, and a third party may subsequently file a patent covering such intellectual property.

Should any of these events occur, they could significantly harm our business, financial condition, results of operations and prospects.

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

In addition to seeking patent protection for certain aspects of our product candidates and delivery technologies, we also consider trade secrets, including confidential and unpatented know-how, important to the maintenance of our competitive position. We protect trade secrets and confidential and unpatented know-how, in part, by customarily entering into non-disclosure and confidentiality agreements with parties who have access to such knowledge, such as our employees, outside scientific and commercial collaborators, CROs, CMOs, consultants, advisors and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants that obligate them to maintain confidentiality and assign their inventions to us. 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. In addition, our trade secrets may otherwise become known, including through a potential cybersecurity breach, or may be independently developed by competitors.

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 in the U.S. and certain foreign jurisdictions 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 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 harmed.

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

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. OPTINOSE®, XHANCE®, EDS® and Exhalation Delivery System™ are trademarks of ours in the U.S. Our trademarks may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks or may be forced to stop using these names, which we need for name recognition by potential partners or customers in our markets of interest. If we are unable to establish name recognition based on our trademarks, we may not be able to compete effectively.

Risks Related to Ownership of Our Common Stock

The price of our common stock may be volatile and you may lose all or part of your investment.

The market price of our common stock is likely to be highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control. In addition to the factors discussed in this "Risk Factors" section and elsewhere in this Annual Report on Form 10-K, these factors include:

- our ability to successfully commercialize XHANCE;
- any delay in our regulatory approval or filings for XHANCE for a follow-on indication for the treatment of chronic sinusitis or any other product candidate we may develop, and any adverse development or perceived adverse development with respect to the applicable regulatory authority's review of such filings, including without limitation the FDA's issuance of a "refusal to file" letter, a request for additional information, or a CRL;

- the success of competitive products, technologies or services;
- adverse regulatory actions with respect to our product candidates, including the failure to receive regulatory approval, or our competitors' products or product candidates;
- discovery of previously unknown problems with XHANCE, such as AEs of unanticipated severity or frequency,
- issues involving manufacturing of XHANCE or any of our products that may be under development;
- actual or anticipated changes in our growth rate relative to our competitors;
- announcements by us or our competitors of significant acquisitions or divestitures, strategic collaborations, joint ventures, collaborations or capital commitments;
- the impact of COVID-19 on our business, including the manufacture, supply, distribution and sale of XHANCE;
- the commencement, enrollment or results of planned clinical trials of our product candidates or any future clinical trials we may conduct, or any changes generally in the development status of our product candidates or those of our competitors;
- regulatory or legal developments in the U.S. and other countries;
- the outcome of any investigations or regulatory scrutiny of our operations or litigation that may be brought against us;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the level of expenses related to any of our product candidates or clinical development programs;
- actual or anticipated variations in our quarterly operating results;
- our ability to develop, acquire or license additional product candidates in other areas of the ENT and allergy markets;
- failure to meet the estimates and projections of the investment community or financial guidance that we may otherwise provide to the public;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- actual or anticipated changes in estimates as to development timelines that we may provide to the public;
- variations in our financial results or those of companies that are perceived to be similar to us;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us, our insiders or our other stockholders;
- significant lawsuits, including patent or stockholder litigation;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- general political, economic, industry and market conditions;
- investors' general perception of our company and our business;
- publication of research reports about us, our competitors or our industry, or positive or negative recommendations or withdrawal of research coverage by securities or industry analysts; and
- other events or factors, many of which are beyond our control.

In addition, the stock market in general, and pharmaceutical companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. Broad market and industry factors may negatively affect the market price of our common stock, regardless of our actual operating performance. The realization of any of the above risks or any of a broad range of other risks stated above could have a material adverse effect on the market price of our common stock.

Sales of a substantial number of shares of our common stock in the public market could cause our stock price to fall, even if our business is doing well.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. If our stockholders sell, or the market perceives that the holders of a large number of shares intend to sell, substantial amounts of our common stock in the public market, the market price of our common stock could decline significantly.

As of March 1, 2023, there were 111,810,073 outstanding shares of our common stock. Holders of an aggregate of 14,461,137 shares of our common stock have rights, subject to specified conditions, that require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. Of these shares, 14,273,017 are already covered by a registration statement and may be sold in the public market pursuant to such registration statement. Additionally, these shares are also eligible for sale without registration under Rule 144, subject to volume limitations applicable to affiliates. If these additional shares are sold, or if it is perceived that they will be sold, in the public market, the trading price of our common stock could decline.

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

We will likely require additional capital in the future to execute our business plan. To raise capital, we may sell substantial amounts of common stock or securities convertible into or exchangeable for common stock. These future issuances of common stock or common stock-related securities, together with the exercise of outstanding options, restricted stock units, warrants and any additional shares issued in connection with acquisitions, if any, may result in material dilution to our investors and may cause our stock price to fall. Such sales may also result in new investors receiving rights, preferences and privileges senior to those of holders of our common stock.

Our principal stockholders and management own a substantial percentage of our stock and are able to exert significant control over matters subject to stockholder approval, which could prevent new investors from influencing significant corporate decisions.

Our executive officers, directors, beneficial owners of 5% or more of our capital stock and their respective affiliates, in the aggregate, beneficially own approximately 59.0% of our outstanding common stock as of December 31, 2022. Entities associated with MVM Partners, LLC (MVM) and Fidelity, our largest stockholders, each hold approximately 13.1% of our common stock as of December 31, 2022. Additionally, entities associated with Avista Capital Partners II, L.P. (Avista) collectively hold as a group approximately 12.8% of our outstanding stock as of December 31, 2022. As a result, Avista, Fidelity and MVM can significantly influence the outcome of matters requiring stockholder approval, including the election of directors, amendments of our organizational documents, or approval of any merger, sale of assets or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may feel are in your best interest. The interests of Avista, Fidelity and MVM may not always coincide with your interests or the interests of other stockholders and they may act in a manner that advances their best interests and not necessarily those of other stockholders, including seeking a premium value for their common stock. In addition, because Avista and certain of our other principal stockholders have held their shares for several years, they may be more interested in selling our company than other investors, or they may want us to pursue strategies that deviate from the interests of other stockholders. Such concentration of ownership control may also:

- delay, defer or prevent a change in control;
- entrench our management and/or the board of directors; or
- impede a merger, consolidation, takeover or other business combination involving us that other stockholders may desire.

We may also take actions that our other stockholders do not view as beneficial, which may adversely affect our results of operations and financial condition and cause the value of your investment to decline.

Some provisions of our charter documents and Delaware law may have anti-takeover effects that could discourage an acquisition of us by others, even if an acquisition would be beneficial to our stockholders, and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our fourth amended and restated certificate of incorporation and our amended and restated bylaws, as well as provisions of Delaware law, could make it more difficult for a third party to acquire us or increase the cost of acquiring us, even if doing so would benefit our stockholders, or remove our current management. These include provisions that:

- permit our board of directors to issue up to five million shares of preferred stock, with any rights, preferences and privileges as it may designate, which issuance could result in the loss of voting control by other stockholders;
- provide that our board of directors will be classified into three classes with staggered, three-year terms and that, directors may only be removed for cause by the affirmative vote of the holders of at least a majority of the voting power of outstanding shares of our capital stock;
- provide that all vacancies on our board of directors, including as a result of newly created directorships, may, except as otherwise required by law, be filled only by the affirmative vote of a majority of directors then in office, even if less than a quorum;
- require that any action to be taken by our stockholders must be effected at a duly called annual or special meeting of stockholders and not be taken by written consent;
- provide that stockholders seeking to present proposals before a meeting of stockholders or to nominate candidates for election as directors at a meeting of stockholders must provide advance notice in writing, and also specify requirements as to the form and content of a stockholder's notice;
- require that the amendment of certain provisions of our certificate of incorporation relating to anti-takeover measures may only be approved by a vote of 66 2/3% of our outstanding common stock;
- require that the amendment of our bylaws be approved by the affirmative vote of a majority of directors then in office or 66 2/3% of our outstanding common stock entitled to vote thereon;
- do not provide for cumulative voting rights, thereby allowing the holders of a majority of the shares of common stock entitled to vote in any election of directors to elect all of the directors standing for election; and
- provide that special meetings of our stockholders may be called only by the chairman or vice chairman of our board of directors, our chief executive officer, or a majority of our board of directors.

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, who are responsible for appointing the members of our management. We are also governed by the provisions of Section 203 of the Delaware General Corporation Law. These provisions may discourage, delay or prevent someone from acquiring us or merging with us whether or not it is desired by or beneficial to our stockholders. Under Section 203, a corporation may not, in general, engage in a business combination with any holder of 15% or more of its capital stock unless the holder has held the stock for three years or, among other things, prior to the time the stockholder has become an interested stockholder, the board of directors has approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder.

These provisions of our fourth amended and restated certificate of incorporation, our amended and restated bylaws and Delaware law could have the effect of discouraging potential acquisition proposals and delaying or preventing a change in control. They could also have the effect of discouraging others from making tender offers for our common stock, including transactions that may be in your best interests or provide an opportunity for our stockholders to receive a premium for their shares of our common stock. These provisions could also affect the price that some investors are willing to pay for our common stock.

Our certificate of incorporation also provides that the Court of Chancery of the State of Delaware will be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our

stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our fourth amended and 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 exclusive forum for any derivative action or proceeding brought on our behalf; any action asserting a breach of fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders; any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our certificate of incorporation or our bylaws; or any action asserting a claim against us that is governed by the internal affairs doctrine. Our fourth amended and restated certificate of incorporation also provides that the U.S. District Court for the District of Delaware and any appellate courts thereof will be the exclusive forum for resolving any such complaint for which subject matter jurisdiction of such claim is vested exclusively in the federal courts of the U.S. These choice of forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. Alternatively, if a court were to find the choice of forum provisions contained in our certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions.

General Risk Factors

We may acquire other assets or businesses, or form collaborations or make investments in other companies or technologies, which could negatively impact our operating results, dilute our stockholders' ownership, increase our debt or cause us to incur significant expense.

As part of our business strategy, we may pursue acquisitions of assets, including preclinical, clinical or commercial-stage products or product candidates, businesses or strategic alliances and collaborations, to expand our existing technologies and operations. We may not identify or complete these transactions in a timely manner, on a cost-effective basis, or at all, and we may not realize the anticipated benefits of any such transaction. We may not be able to find suitable acquisition candidates, and if we make any acquisitions, we may not be able to complete technology transfers and integrate these acquisitions successfully into our existing business and we may incur additional debt or assume unknown or contingent liabilities as part of the transaction. Integration of an acquired company or assets may also disrupt ongoing operations, require the hiring of additional personnel and the implementation of additional internal systems and infrastructure, especially the acquisition of commercial assets, and require management resources that would otherwise focus on developing our existing business. We may not be able to find suitable strategic collaborators or identify other investment opportunities, and we may experience losses related to any such investments.

To finance any acquisitions or collaborations, we may choose to issue debt or shares of our common or preferred stock as consideration. Any such issuance of shares would dilute the ownership of our stockholders. If the price of our common stock is low or volatile, we may not be able to acquire other assets or companies or fund a transaction using our stock as consideration. Alternatively, it may be necessary for us to raise additional funds for acquisitions through public or private financings. Additional funds may not be available on terms that are favorable to us, or at all.

Our sales force and other employees, PPN partners, CMOs, CROs, principal investigators, co-promotion partners, collaborators, independent contractors, consultants and other vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk that our sales force and other employees, PPN partners, CMOs, CROs, principal investigators, collaborators, independent contractors, consultants and other vendors may engage in fraudulent or other illegal activity with respect to our business. Misconduct by these employees could include intentional, reckless and/or negligent conduct or unauthorized activity that violates:

- FDA promotion or other regulations, including those laws requiring the reporting of true, complete and accurate information to the FDA;
- manufacturing standards;
- federal and state healthcare fraud and abuse laws and regulations; or
- laws that require the true, complete and accurate reporting of financial information or data.

In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Misconduct by these parties could also involve individually identifiable information, including, without limitation, the improper use of information obtained in the course of clinical trials, or illegal misappropriation of drug product, which could result in regulatory sanctions and serious harm to our reputation. Any incidents or any other conduct that leads to an employee receiving an FDA debarment could result in a loss of business from third parties and severe reputational harm.

We have a Code of Business Conduct and Ethics to govern and deter such behaviors, but it is not always possible to identify and deter employee misconduct, 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. 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, including the imposition of civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, and curtailment of our operations.

If we fail to comply with data and privacy protection laws and regulations, we could be subject to government enforcement actions, which could include civil or criminal penalties, as well as private litigation and/or adverse publicity, any of which could negatively affect our operating results and business.

Our business is subject to complex and evolving U.S., state and international data and privacy protection laws. In the U.S., numerous federal and state laws and regulations, including state data breach notification laws, state health information privacy laws, and federal and state consumer protection laws (e.g., Section 5 of the Federal Trade Commission Act) govern the collection, use, disclosure, and protection of health-related and other personal information. Compliance with these laws is difficult, constantly evolving, and time consuming. These laws may differ from each other in significant ways, thus complicating compliance efforts. Many of the state laws enable a state attorney general to bring actions and provide private rights of action to consumers as enforcement mechanisms. Failure to comply with data protection laws and regulations could result in government enforcement actions and create liability for us (which could include civil and/or criminal penalties), private litigation and/or adverse publicity. Federal regulators, state attorneys general, and plaintiffs' attorneys have been and will likely continue to be active in this space. We may also obtain health information from third parties (e.g., healthcare providers who prescribe our products) that are subject to privacy and security requirements under HIPAA, and other privacy and data security and consumer protection laws. Although we are not directly subject to HIPAA, other than potentially with respect to providing certain employee benefits, we could potentially be subject to criminal penalties if we, our affiliates, or our agents knowingly receive individually identifiable health information maintained by a HIPAA-covered entity in a manner that is not authorized or permitted by HIPAA, and could also potentially be subject to other civil and/or criminal penalties if we obtain, use or disclose information in a manner not permitted by other privacy and data security and consumer protection laws.

The Federal Trade Commission (the "FTC") also sets expectations for failing to take appropriate steps to keep consumers' personal information secure, or failing to provide a level of security commensurate to promises made to individual about the security of their personal information (such as in a privacy notice) may constitute unfair or deceptive acts or practices in violation of Section 5(a) of the FTC 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. Individually identifiable health information is considered sensitive data that merits stronger safeguards. With respect to privacy, the FTC also sets expectations that companies honor the privacy promises made to individuals about how the company handles consumers' personal information; any failure to honor promises, such as the statements made in a privacy policy or on a website, may also constitute unfair or deceptive acts or practices in violation of the FTC Act. While we do not intend to engage in unfair or deceptive acts or practices, the FTC has the power to enforce promises as it interprets them, and events that we cannot fully control, such as data breaches, may be result in FTC enforcement. Enforcement by the FTC under the FTC Act can result in civil penalties or enforcement actions.

Additionally, the General Data Protection Regulation (GDPR), applicable in the European Union (EU), applies to our activities conducted from an establishment in the EU or related to products and services that we may offer to EU users that involve the collection, use, storage, transfer, and other processing of personal data, including personal health data. The GDPR creates a range of new compliance obligations and restrictions on the ability to collect, analyze and transfer personal data, which could cause us to change our business practices, and has significantly increased financial penalties for noncompliance (including possible fines of up to 4% of global annual turnover for the preceding financial year or €20 million (whichever is higher) for the most serious infringements). In particular, these obligations and restrictions concern the consent of the individuals to whom the personal data relates, the information provided to the individuals, the sharing of personal data with third parties, the transfer of personal data out of the EU, security breach notifications, security and confidentiality of the personal data and imposition of substantial potential fines for violations of the data protection obligations. Specifically regarding the transfer of personal data outside of the EU, while there are legal mechanisms available to lawfully transfer personal data outside of the EU, including to the United States, there are certain unsettled legal issues regarding such data transfers, the resolution of which may adversely affect our ability to transfer personal data or otherwise may cause us to incur significant costs to come into compliance with applicable data transfer impact assessments and implementation of legal data transfer mechanisms. On July 16, 2020, the European Court of Justice ruled the EU-US Privacy Shield to be an invalid data transfer mechanism and confirmed that the Model Clauses remain valid, and in June 2021, the European Commission published updated versions of the Model Clauses, which must be incorporated into new and existing agreements within prescribed timeframes in order to continue to lawfully transfer personal data outside of the EU. Data protection authorities from the different EU member states, as well as in the United Kingdom and Switzerland, have promulgated national privacy laws that impose additional requirements, which add to the complexity of processing and transferring EU personal data, with the United Kingdom and Switzerland following the EU with the publication of new Model Clauses to be incorporated in all applicable contracts within a specified timeframe in order to legitimize data transfers from those jurisdictions. Our ability to continue to transfer personal data outside of the EU, United Kingdom, or Switzerland may become significantly more costly and may subject us to increased scrutiny and liability under the GDPR or similar local laws, and we may experience operating disruptions if we are unable to conduct these transfers in the future.

The California Consumer Privacy Act, or CCPA, establishes certain requirements for data use and sharing transparency and provides California residents certain rights concerning the use, disclosure, and retention of their personal data. The CCPA and its implementing regulations have already been amended multiple times since their enactment. In November 2020, California voters approved the California Privacy Rights Act (“CPRA”) ballot initiative, which introduced significant amendments to the CCPA and established and funded a dedicated California privacy regulator, the California Privacy Protection Agency. The amendments introduced by the CPRA went into effect on January 1, 2023, and new implementing regulations are expected to be introduced by the California Privacy Protection Agency. Failure to comply with the CCPA may result in, among other things, significant civil penalties and injunctive relief, or potential statutory or actual damages. In addition, California residents have the right to bring a private right of action in connection with certain types of incidents. These claims may result in significant liability and damages. We implemented processes to manage compliance with the CCPA and continue to assess the impact of the CPRA, and other state legislation, on our business as additional information and guidance becomes available. These laws and regulations are evolving and subject to interpretation, and may impose limitations on our activities or otherwise adversely affect our business. Similarly, there are a number of legislative proposals in the European Union, the United States, at both the federal and state level, and in other jurisdictions that could impose new obligations or limitations in areas affecting our business. For example, other states, including Virginia, Colorado, Utah, and Connecticut have enacted privacy laws similar to the CCPA that impose new obligations or limitations in areas affecting our business and we continue to assess the impact of these state legislations on our business as additional information and guidance becomes available. In addition, some countries are considering or have passed legislation implementing data protection requirements or requiring local storage and processing of data or similar requirements that could increase the cost and complexity of delivering our services and research activities. These laws and regulations, as well as any associated claims, inquiries, or investigations or any other government actions may lead to unfavorable outcomes including increased compliance costs, delays or impediments in the development of new products, negative publicity, increased operating costs, diversion of management time and attention, and remedies that harm our business, including fines or demands or orders that we modify or cease existing business practices.

Certain of these laws and regulations are described in greater detail in the previous section under "Business — Government Regulation — Healthcare Privacy Laws." If we, our agents, or our third party partners fail to comply or are alleged to have failed to comply with these or other applicable data protection and privacy laws and regulations, or if we were to experience a data breach involving personal information, we could be subject to government enforcement actions or private lawsuits. Any associated claims, inquiries, or investigations or other government

actions could lead to unfavorable outcomes that have a material impact on our business including through significant penalties or fines, monetary judgments or settlements including criminal and civil liability for us and our officers and directors, increased compliance costs, delays or impediments in the development of new products, negative publicity, increased operating costs, diversion of management time and attention, or other remedies that harm our business, including orders that we modify or cease existing business practices.

Our business and operations would suffer in the event of computer system failures, cyberattacks or a deficiency in our cybersecurity or those of any business partners.

Despite the implementation of security measures, our internal computer systems and those of our contractors, vendors, customers and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures, cyberattacks or cyber-intrusions over the Internet, loss of funds or information from phishing or other fraudulent schemes, attachments to emails, persons inside our organization, or persons with access to systems inside our organization or those with whom we do business. The risk of a security breach or disruption, particularly through cyber-attacks 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. Such an event could cause interruption of our operations or loss of Company funds and have a negative financial consequence on our business. For example, the loss of data from completed or ongoing clinical trials for our product candidates could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data, or could result in a delay of the services provided by our vendor. Although we are targeted for cyber-attacks from time to time, we are only aware of one instance where an unauthorized third party accessed certain parts of our computer systems and we believe we have addressed the matter without any known financial implication, loss of data or exposure of confidential or personal information. To the extent that any disruption or security breach were to result in a loss of or damage to our data, misappropriation of funds to unintended recipients, or inappropriate disclosure of confidential, proprietary or personal information, we could incur material legal claims and liabilities and damage to our reputation and the development and commercialization of XHANCE and our other product candidates could be delayed. Additionally, breach remediation costs may be significant. Despite our efforts and the ever-changing threat landscape, the possibility of these events occurring cannot be eliminated entirely and there can be no assurance that any measures we take will prevent cyber-attacks or security breaches that could adversely affect our business.

We may be exposed to liabilities under the U.S. Foreign Corrupt Practices Act and other U.S. and foreign anti-corruption anti-money laundering, export control, sanctions, and other trade laws and regulations, and any determination that we violated these laws could have a material adverse effect on our business.

We are subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. Customs regulations, and various economic and trade sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Control. We are also subject to the U.S. Foreign Corrupt Practices Act of 1977, as amended (FCPA), the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, the United Kingdom Bribery Act 2010, the Proceeds of Crime Act 2002, and possibly other anti-bribery and anti-money laundering laws in countries outside of the U.S. in which we conduct our activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees and third-party intermediaries from authorizing, promising, offering, providing, soliciting, or accepting, directly or indirectly, improper payments or benefits to or from any person whether in the public or private sector. As we commercialize XHANCE and any other product candidates that we may develop, we may engage with third-party manufacturers and collaborators who operate abroad and are required to obtain certain necessary permits, licenses and other regulatory approvals with respect to our business. Our activities abroad create the risk of unauthorized payments or offers of payments by employees, consultants, sales agents or distributors, even though they may not always be subject to our control. We have implemented policies to discourage these practices by our employees, consultants, sales agents and distributors. However, our employees, consultants, sales agents, or distributors of our company may engage in conduct for which we might be held responsible, even if we do not explicitly authorize such activities.

Noncompliance with anti-corruption, anti-money laundering, export control, sanctions, and other trade 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 and/or debarment from contracting with certain persons, the loss of export privileges, reputational harm, adverse media coverage and other collateral consequences. If any subpoenas or investigations are launched, or governmental or other sanctions are imposed, or if we do not prevail in any possible civil or criminal litigation, our business, results of operations and financial condition could be materially harmed. Responding to any action will

likely result in a materially significant diversion of management's attention and resources and significant defense and compliance costs and other professional fees. In addition, the U.S. government may seek to hold us liable for successor liability FCPA violations committed by companies in which we invest or that we acquire. As a general matter, enforcement actions and sanctions could harm our business, results of operations, and financial condition.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our principal office is located in Yardley, Pennsylvania, where we lease approximately 30,000 square feet of office space pursuant to a lease that expires in May 2024. We also lease facilities in Ewing, New Jersey. We believe our facilities are adequate to meet our current needs, although we may seek to negotiate new leases or evaluate additional or alternate space for our operations. We believe appropriate alternative space will be readily available on commercially reasonable terms.

ITEM 3. LEGAL PROCEEDINGS

We are not currently a party to any material pending legal proceedings.

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

Our common stock is traded on The Nasdaq Global Select Market under the symbol “OPTN”. As of March 1, 2023, there were 111,810,073 shares of our common stock outstanding. There were approximately 18 stockholders of record at March 1, 2023. Because many of our shares are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of stockholders represented by these record holders.

Securities Authorized for Issuance under Equity Compensation Plans

Information required by Item 5 of Form 10-K regarding our equity compensation plans is incorporated herein by reference to Item 12 of Part III of this Annual Report on Form 10-K.

Recent Sales of Unregistered Securities

Other than as previously disclosed on our Current Reports on Form 8-K or Quarterly Reports on Form 10-Q filed with the SEC, we did not issue any unregistered equity securities during the twelve months ended December 31, 2022.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

None.

ITEM 6. RESERVED

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations together with our historical consolidated financial statements and the related notes thereto appearing in this Annual Report. In addition to historical information, some of the information contained in this discussion and analysis or set forth elsewhere in this Annual Report, includes forward-looking statements that involve risks and uncertainties. As a result of many factors, including those factors set forth in the “Risk Factors” section of this Annual Report, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis. See "Note Regarding Forward-Looking Statements"

Company Overview

We are a specialty pharmaceutical company focused on the development and commercialization of products for patients treated by ear, nose and throat (ENT) and allergy specialists. Our first commercial product, XHANCE®

(fluticasone propionate) nasal spray, 93 micrograms (mcg), is a therapeutic utilizing our proprietary Exhalation Delivery System (EDS) that delivers a topically-acting corticosteroid for the treatment of chronic rhinosinusitis with nasal polyps and, if approved, chronic rhinosinusitis without nasal polyps (also known as chronic sinusitis). Chronic rhinosinusitis is a serious nasal inflammatory disease that is treated using therapies, such as intranasal steroids (INS), which have significant limitations. We believe XHANCE has a differentiated clinical profile with the potential to become part of the standard of care for this disease because it is able to deliver medication to the primary site of inflammation high and deep in the nasal passages in regions not adequately reached by conventional INS.

In September 2017, the U.S. Food and Drug Administration (FDA) approved XHANCE for the treatment of nasal polyps in patients 18 years of age or older. XHANCE was made widely available through commercial channels in April 2018. In January 2023, the indication statement for XHANCE was changed from “for the treatment of nasal polyps” to “for the treatment of chronic rhinosinusitis with nasal polyps” to reflect current FDA labeling terminology and not based on new XHANCE clinical trial data.

In March and June 2022, we announced positive top line results from our two Phase 3b clinical trials in of XHANCE for a follow-on indication for the treatment of chronic sinusitis. In February 2023, we submitted a prior approval efficacy supplement (sNDA) to support the approval of a new indication for XHANCE for the treatment of chronic sinusitis. Assuming the FDA's acceptance of the sNDA submission and a standard review period, we expect the FDA's target action date to be in December 2023. If the sNDA is approved, XHANCE has the potential to be the first drug therapy approved by the FDA for the treatment of chronic sinusitis.

We believe XHANCE could become a part of the standard of care for the treatment of patients with chronic rhinosinusitis with and without nasal polyps before they progress to more costly treatment alternatives and could also be adopted as a maintenance therapy to improve outcomes following sinus surgery.

Business Updates

We track and report metrics that we believe are an important part of assessing our progress in key strategic areas including:

- XHANCE Prescriptions and Market Share. Based on third-party prescription data as well as data from PPN partners, the total estimated number of XHANCE prescriptions in the fourth quarter of 2022 was 86,200, which represents an 8% decrease for prescriptions when compared to estimated fourth quarter 2021 prescriptions of 93,700. The INS prescription market increased approximately 3% from fourth quarter 2021 to fourth quarter 2022 based on third-party prescription data. In addition, the total estimated number of XHANCE prescriptions was 80,600 in the first quarter of 2022, 87,600 in the second quarter of 2022, and 86,600 in the third quarter of 2022.

  A seasonal effect has historically been observed in the INS prescription market in which market volume generally peaks near the middle of the second quarter and declines into the early part of the third quarter of each calendar year. Based on third-party prescription data, INS market prescriptions decreased 4% from the fourth quarter of 2020 to the first quarter of 2021, increased 14% from the first quarter of 2021 to the second quarter of 2021, decreased 4% from the second quarter of 2021 to the third quarter of 2021, increased 1% from the third quarter of 2021 to the fourth quarter of 2021, were flat from the fourth quarter of 2021 to the first quarter of 2022, increased 7% from the first quarter of 2022 to the second quarter of 2022, decreased 7% from the second quarter of 2022 to the third quarter of 2022, and increased 4% from the third quarter of 2022 to the fourth quarter of 2022. In addition, based on third-party prescription data, INS market prescriptions decreased 7% from full year 2019 to full year 2020, were flat from full year 2020 to full year 2021, and increased 4% from full year 2021 to full year 2022.

  Although the underlying disease that we are treating is chronic and causes symptoms year-round, we believe the variation in patient flow through the offices of relevant physician specialists, and seasonality in disease flare-ups, has an impact on the number of patients that present themselves and who are therefore available to receive a new prescription for XHANCE.

  Additionally, we believe that first quarter prescription demand and average net revenue per prescription for XHANCE is adversely impacted by the annual resetting of patient healthcare insurance plan deductibles and changes in individual patients' healthcare insurance coverage, both of which often occur in January.

  We believe our co-pay savings program and market access influence prescription volume. In January 2021 we adjusted the terms of our co-pay savings program to decrease the number and proportion of total

prescriptions filled by patients in commercial insurance plans that do not cover XHANCE. In January 2022 we adjusted the terms of our co-pay savings program to decrease the number and proportion of total prescriptions filled by patients in commercial insurance plans that have high deductibles. In the future we may make additional changes to our co-pay savings program that could influence prescription volume.

In addition, while we believe that as of December 31, 2022, approximately 80% of commercially insured lives are currently in a plan that covers XHANCE, payors generally impose restrictions on access to or usage of XHANCE, such as by requiring prior authorizations or "step-edits". For example, insurers may require that a physician attest that they are treating a patient for an approved indication prior to becoming eligible for coverage for XHANCE. Approximately half of the commercially covered lives as of December 31, 2022 are in a plan that requires a prior authorization and most of those prior authorizations request information regarding prior use of INS and patient diagnosis. In some cases, patients do not meet the payors' utilization management criteria. Some providers may not complete the burdensome administrative process required to demonstrate or document that the patients for whom XHANCE has been prescribed meet the payors' utilization management criteria (i.e., prior authorizations or step-edits) and, as a result, patients will not gain access to XHANCE treatment. We believe increasing rates of enforcement of the utilization management criteria had a negative effect on XHANCE prescription volume growth in 2022 and may continue to have a negative effect on prescription volume in the future. These requirements include physician attestation to a diagnosis of nasal polyps which can be a hurdle for some physicians in our target audience because it is not a diagnosis they make commonly.

We track the market share of XHANCE within our current target audience. For this purpose, we calculate market share as the proportion of XHANCE prescriptions to the number of prescriptions written for other INS within our current target audience of approximately 21,000 physicians. Our target physician audience includes all ENT and Allergy specialist physicians who, based on third-party data, write intranasal steroid spray prescriptions. In addition, our current target audience includes specialty-like primary care physicians called on by our territory managers.

We believe market share, in addition to XHANCE prescription volume, can provide information regarding XHANCE utilization because market share normalizes XHANCE prescriptions for market effects including the INS market seasonality, seasonal variation in patient visits with their doctor, annual deductible resets and annual changes in individual patient's healthcare insurance coverage referenced above. Based on third-party prescription data as well as data from PPN partners, we estimate XHANCE had a market share in our current target audience of 21,000 physicians of 4.8% in the fourth quarter of 2020, 5.0% in the first quarter of 2021, 5.2% in the second quarter of 2021, 5.7% in the third quarter of 2021, 5.9% in the fourth quarter of 2021, 5.4% in the first quarter of 2022, 5.6% in the second quarter of 2022, 5.7% in the third quarter of 2022, and 5.7% in the fourth quarter of 2022. Note that most of the INS prescriptions written within our target physician audience are for chronic sinusitis, allergic rhinitis and other conditions outside of our nasal polyp indication. Our target physician audience is subject to revision each quarter to account for changes such as revised sales target prioritization, and physician retirements. Changes to the target physician audience can contribute to some of the quarter-over-quarter change in market share.

- XHANCE New Prescriptions and Refill Prescriptions. The underlying disease that we are treating is chronic and, as a result, many patients may fill multiple prescriptions per year. We monitor new prescriptions as they create the potential for future refill prescriptions. Based on third-party prescription data as well as data from PPN partners, the total estimated number of XHANCE new prescriptions in the fourth quarter of 2022 was 27,700, which represents a 7% decrease for new prescriptions when compared to estimated fourth quarter 2021 new prescriptions of 29,900. In addition, the total estimated number of XHANCE new prescriptions was 28,200 in first quarter 2022, 29,200 in second quarter 2022, and 28,000 in third quarter 2022. Based on third-party prescription data, the INS market for new prescriptions increased 5% from the fourth quarter of 2021 to the fourth quarter of 2022 and increased 7% from the third quarter of 2022 to the fourth quarter of 2022. In addition, based on third-party prescription data, the INS market for new prescriptions decreased 13% from full year 2019 to full year 2020, increased 4% from full year 2020 to full year 2021, and increased 7% from full year 2021 to full year 2022.

  We track refill prescriptions and provide patient assistance to support refill programs that are administered by our PPN partners. Based on third-party prescription data as well as data from PPN partners, the total estimated number of XHANCE refill prescriptions in the fourth quarter of 2022 was 58,500, which represents an 8% decrease for refill prescriptions when compared to estimated fourth quarter 2021 refill prescriptions of 63,800. In addition, the total estimated number of XHANCE refill prescriptions was 52,400 in first quarter 2022, 58,400 in second quarter 2022, and 58,600 in third quarter 2022.

- Prescribing Breadth and Depth. We track the number of physicians who prescribe XHANCE in a time period to evaluate the breadth of prescribing. Based on third-party prescription data as well as data from PPN partners, the total estimated number of physicians who had at least one patient fill a prescription for XHANCE in the fourth quarter of 2022 was 8,104, which represents 8% growth when compared to the estimated 7,532 physicians who had at least one patient fill a prescription for XHANCE in the fourth quarter of 2021. In addition, the total estimated number of physicians who had at least one patient fill a prescription for XHANCE was 7,690 in the first quarter of 2022, 7,851 in the second quarter of 2022, and 7,892 in the third quarter of 2022.

  We also track the number of prescriptions filled by a prescribing physician's patients in a time period to evaluate depth of prescribing. Based on third-party prescription data as well as data from PPN partners, the total estimated number of physicians who had more than 15 XHANCE prescriptions filled by their patients in the fourth quarter of 2022 was 1,449, which represents a decrease of 9% when compared to the estimated 1,589 physicians who had more than 15 XHANCE prescriptions filled by their patients in the fourth quarter of 2021. In addition, the total estimated number of physicians who had more than 15 XHANCE prescriptions filled by their patients was 1,468 in the first quarter of 2022, 1,500 in the second quarter of 2022, and 1,491 in the third quarter of 2022.

- XHANCE Net Product Revenues per Prescription. We calculate average net product revenues per prescription, one metric that we use to gauge the profitability of XHANCE, by dividing net product revenues for the quarter by the estimated number of XHANCE prescriptions dispensed during the quarter. Average XHANCE net product revenues per prescription were $242 in the fourth quarter of 2022 which represents a 1% increase when compared to the $240 average XHANCE net product revenues per prescription in the fourth quarter of 2021. In addition, average XHANCE net revenues per prescription were $183 in the first quarter of 2022, $235 in the second quarter of 2022, and $232 in the third quarter of 2022.

Business Updates in Response to the COVID-19 Pandemic

The COVID-19 pandemic has caused business and economic disruption, and may cause future disruption.

- Where permitted by governmental requirements and the policies of physician offices, our territory managers began to return to in-person detailing of physicians in May and June 2020. Given the localized nature of the restrictions that are in place and the potential for restrictions to return, we have equipped our territory managers to operate in an environment that will include a mix of virtual and in-person physician detailing with dependencies on geography and time. We are currently operating under a hybrid-model for our office-based employees which includes a mix of in-office and work-from-home days.

- Federal, state and local government requirements and guidances have impacted virtually all of the physicians' offices in which our territory managers detail XHANCE. These impacts include reduced patient visits, temporary halt of territory managers' visits, restrictions imposed on the logistics and frequency of territory managers' visits, physician office staff turnover, and temporary closings of physicians' offices. We believe the restrictions imposed on the logistics and frequency of territory managers' visits have now become permanent in some physician officers which is adversely impacting the effectiveness of our sales force.

- Although XHANCE prescriptions have grown since the start of the pandemic, the rate of growth was below our pre-pandemic expectations. The duration and magnitude of the impact of the COVID-19 pandemic on XHANCE prescriptions and XHANCE net revenue has had and could in the future continue to affect our ability to remain in compliance with the financial covenant to achieve certain minimum trailing twelve month consolidated XHANCE net product sales and royalties and other covenants under that certain Note Purchase Agreement dated as of September 12, 2019 that we entered into with funds managed by Pharmakon Advisors, LP (Pharmakon), the investment manager of the BioPharma Credit Funds (BioPharma), as amended pursuant to that certain letter agreement dated as of August 13, 2020, as further amended by that certain First Amendment to Note Purchase Agreement dated as of March 2, 2021, as further amended pursuant to that certain Second Amendment to Note Purchase Agreement dated as of November 16, 2021, as further amended pursuant to that certain Third Amendment dated as of August 10, 2022, as further amended pursuant to that certain Fourth Amendment to Note Purchase Agreement dated as of November 9, 2022, and as further amended pursuant to that certain Amended and Restated Note

Purchase Agreement dated as of November 23, 2023 (as so amended and restated, the "A&R Note Purchase Agreement").

- We believe we are maintaining appropriate levels of finished product inventories in the event of future supply disruption; however, the duration and magnitude of a future negative impact from the COVID-19 pandemic could constrain our supply of XHANCE.
- For subjects that participated in our two chronic sinusitis trials, procedures to facilitate ongoing treatment and capture of data during periods of in-person care restrictions were put in place. Pauses in patient enrollment due to factors related to the COVID-19 pandemic had varying effects in different geographies which resulted in delays and additional costs associated with our chronic sinusitis trials.

The COVID-19 pandemic has had, and may continue to have, adverse impacts on XHANCE prescription volume and net revenues as a result of fewer patients visiting physician offices, the restrictions imposed on the logistics and frequency of territory managers' visits becoming permanent in some physician offices, turnover of physician office staff, changes in employment that can adversely affect availability of insurance coverage of XHANCE, our ability to maintain compliance with the financial and other covenants under the A&R Note Purchase Agreement, and the availability and cost of capital for us to fund our business operations and service our debt. We will continue to assess the evolving impact of the COVID-19 pandemic and will make adjustments to our operations as necessary.

Financial Operations Overview

The following discussion sets forth certain components of our consolidated statements of operations as well as factors that impact those items.

Net product revenues

Sales of XHANCE generated $76.3 million and $73.7 million in net product revenues for the years ended December 31, 2022 and 2021, respectively. In accordance with GAAP, we determine net product revenues for XHANCE, with specific assumptions for variable consideration components including but not limited to trade discounts and allowances, co-pay assistance programs and payor rebates.

Based on available XHANCE prescription data purchased from third parties and data from our PPN partners, our average net product revenue per prescription for the fourth quarter of 2022 was $242 which represents a 1% increase when compared to the $240 in the fourth quarter of 2020. Average net product revenue per prescription for the year ended December 31, 2022 was $224, which represents a 2% increase compared to our average net product revenue per prescription of approximately $219 for the year ended December 31, 2021.

We calculate average net product revenues per prescription, one metric that we use to gauge the profitability of XHANCE, by dividing net product revenues for the quarter by the estimated number of XHANCE prescriptions dispensed during the quarter. As a result, average net product revenues per prescription is subject to variability. That variability is impacted by factors that do not necessarily reflect a change in the price that is paid for an individual unit of XHANCE, including but not limited to ordering patterns and inventory levels for our wholesale customers and PPN partners, patient utilization rates of affordability programs and the proportion of patients acquiring XHANCE through an insurance benefit. There is also the potential for variability that results from changes in estimation methodology by the third parties that we rely upon to provide prescription data which may lead to revisions of historical estimates of prescription volumes and our calculated average net product revenues per prescription.

We expect full year 2023 net product revenues will be between $62.0 to $68.0 million. In December 2022, we reduced our number of territory managers from approximately 90 to approximately 77 as part of actions intended to reduce total operating expenses for full year 2023 by approximately $30.0 million compared to 2022, of which approximately half is related to sales and marketing. In addition, the expectation of full year 2023 net product revenues between $62.0 and $68.0 million does not assume net product revenues attributable to a launch of XHANCE as a treatment for patients with chronic sinusitis. Our expectation for full year 2023 net product revenues includes our expectation that first quarter 2023 net product revenues will be approximately $10.0 million. The year-over-year decrease to net product revenues for first quarter 2023 is attributable to an expected increase in gross-to-net deductions and an expected decrease in units shipped. The expected increase in gross-to-net deductions includes increased rebates and changes in business mix that also affect our expectations for full year 2023 net product revenues and average net product revenues per prescription. For the full year 2023, we believe average net product revenues per prescription will be approximately $200.

Licensing revenues

In September 2019, OptiNose AS, a wholly owned subsidiary of the Company, entered into the Currax License Agreement. Under the terms of the Currax License Agreement, Currax paid us a $3.7 million upfront payment in 2019 and an additional $0.8 million in December 2020 upon expiration of the escrow that was established for a limited period to cover potential indemnification obligations. In January 2021, a specified regulatory milestone was met and the Company received a $1.0 million milestone payment. We do not expect to receive any further payments from Currax under the terms of the License Agreement other than reimbursement for certain expenses.

Costs of product sales

Costs of product sales includes the cost of inventory sold, which includes direct and indirect manufacturing and supply chain costs.

Research and development expense

Research and development expense consists primarily of expenses incurred to prepare for, initiate and conduct our planned clinical trials, ongoing research efforts of new products and device improvements. We expense research and development costs as incurred. These expenses include:

- personnel expenses, including salaries, benefits and stock-based compensation expense;
- costs of funding clinical development performed by third parties, including pursuant to agreements with contract research organizations (CROs), as well as investigative sites and consultants that conduct or support our nonclinical studies and clinical trials;
- expenses associated with the continued development of our EDS devices;
- expenses related to the continued development of our product sample portfolio;
- expenses incurred under agreements with contract manufacturing organizations (CMOs), including manufacturing scale-up expenses prior to regulatory approval of products for commercial sale and the cost of acquiring and manufacturing preclinical study and clinical trial materials;
- consultant fees and expenses associated with outsourced professional scientific development services;
- expenses for regulatory activities, including filing fees paid to regulatory agencies and costs incurred to compile and respond to filings with the FDA prior to regulatory approval of products for commercial sale; and
- allocated expenses for facility costs, including rent, utilities, depreciation and maintenance.

We typically use our employee, consultant and infrastructure resources across our research and development programs. Although we track certain outsourced development costs by product candidate, we do not allocate personnel costs or other internal costs to specific product candidates.

Assuming we do not need to conduct additional studies to support an FDA approval of XHANCE for the treatment of chronic sinusitis and we do not undertake new development programs, we expect significantly lower research and development expenses beginning in 2023.

Selling, general and administrative expense

General and administrative expense consists primarily of personnel expenses, including salaries, benefits and stock-based compensation expense, for employees in executive, finance, accounting, business development, information technology, legal and human resource functions. General and administrative expense also includes corporate facility costs, including rent, utilities, depreciation and maintenance, not otherwise included in research and development expense, as well as regulatory fees and professional fees for legal, patent, accounting and other consulting services.

Sales and marketing expenses include our sales team and supporting promotional materials, digital promotion, peer-to-peer education, congresses / conventions, samples, and marketing activities such as direct-to-patient / direct-to-consumer initiatives. Additionally, sales and marketing-related expenses include fees paid to our PPN partners for services unrelated to traditional distribution functions, such as data fees and benefit claims adjudication.

Warrant Liability

In November 2022, the Company issued warrants in connection with a public offering. These warrants are required to be measured at fair value and reported as a liability in the consolidated balance sheet. We recorded the fair value of the warrants upon issuance using a Monte Carlo simulation and are required to revalue the warrants at each reporting date with any changes in fair value recorded on our statement of operations. The valuation of the warrants is considered under Level 3 of the fair value hierarchy due to the need to use assumptions in the valuation that are both significant to the fair value measurement and unobservable. The change in the fair value of the Level 3 warrants liabilities is reflected in the statement of operations for the year ended December 31, 2022.

Interest (income) expense

Interest (income) expense consists of interest earned on our cash and cash equivalents held with institutional banks and interest expense is primarily related to the outstanding senior secured notes issued pursuant to the A&R Note Purchase Agreement (Pharmakon Senior Secured Notes).

Other (income) expense

Other (income) expense consists of foreign currency (income) losses due to exchange rate fluctuations on transactions denominated in a currency other than our functional currency as well as grant income and gains on sale of property and equipment.

Critical accounting policies and use of estimates

Our consolidated financial statements are prepared in accordance with U.S. generally accepted accounting principles (GAAP). The preparation of our consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of expenses during the reported period. We base our estimates on historical experience, known trends and events and various other factors that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. We evaluate our estimates and assumptions on an ongoing basis. Our actual results may differ from these estimates under different assumptions and conditions.

While our significant accounting policies are described in more detail in the notes to our consolidated financial statements appearing elsewhere in this report, we believe that the following accounting policies are those most critical to the preparation of our consolidated financial statements.

Warrant Liability

In November 2022, we issued warrants in connection with a public offering. Pursuant to the terms of the warrants, we could be required to settle the warrants in cash in the event of a "fundamental transaction" as defined in the warrant (which includes, among other things, an acquisition of the Company) and, as a result, the warrants are required to be measured at fair value and reported as a liability in the consolidated balance sheet. We recorded the fair value of the warrants upon issuance using a Monte Carlo simulation and are required to revalue the warrants at each reporting date with any changes in fair value recorded on our statement of operations. The valuation of the warrants is considered under Level 3 of the fair value hierarchy due to the need to use assumptions in the valuation that are both significant to the fair value measurement and unobservable. The change in the fair value of the Level 3 warrants liabilities is reflected in the statement of operations for the year ended December 31, 2022.

Revenue recognition

We account for revenue in accordance with Accounting Standards Codification (ASC) Topic 606, *Revenue from Contracts with Customers*, which was adopted on January 1, 2018. We perform the following five steps to recognize revenue under ASC Topic 606: (i) identify the contract(s) 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. We only recognize revenue when it is probable that we will collect the consideration to which we are entitled in exchange for the goods or services that will be transferred to the customer.

Net product revenues

We recognize XHANCE revenue at the point the customer obtains control of the product, which generally occurs upon delivery. The transaction price that is recognized as revenue for products includes an estimate of variable consideration. Payment terms with customers do not exceed one year and, therefore, we do not account for a financing component in our arrangements. Incremental costs of obtaining a contract with a customer (for example, sales commissions) are expensed when incurred as the period of benefit is less than one year. Shipping and handling costs for product shipments to customers are recorded as selling, general and administrative expenses. Our estimates of variable consideration and determination of whether to include estimated amounts in the transaction price are based largely on an assessment of our anticipated performance and all information (historical, current and forecasted) that is reasonably available. As of December 31, 2022, we did not make any material adjustment to our prior estimates of variable consideration. Further, we believe that reasonable variations in our estimates of variable consideration would not result in material changes to our financial statements. The components of our variable consideration include the following:

Provider Chargebacks and Discounts. Chargebacks for fees and discounts to providers represent the estimated obligations resulting from contractual commitments to sell products to qualified healthcare providers at prices lower than the list prices charged to customers who directly purchase the product from us. Customers charge us for the difference between what they pay for the product and the ultimate selling price to the qualified healthcare providers. These components of variable consideration are established in the same period that the related revenue is recognized, resulting in a reduction of product revenue and accounts receivable. Our provision for chargebacks and discounts consists of our estimates for these credits, which we evaluate based on historical data, estimated future trends, and estimates of inventory held by our customers.

Trade Discounts and Allowances. We generally provide customers with discounts that include incentive fees which are explicitly stated in the Company's contracts. These discounts are recorded as a reduction of revenue and accounts receivable in the period in which the related product revenue is recognized.

Product Returns. Consistent with industry practice, we have a product returns policy that provides customers a right of return for product purchased within a specified period prior to and subsequent to the product's expiration date. We estimate the amount of our product that may be returned and present this amount as a reduction of revenue in the period the related product revenue is recognized, in addition to establishing a current liability. We consider several factors in the estimation process, including expiration dates of product shipped to customers, inventory levels within the distribution channel, product shelf life, prescription trends and other relevant factors.

Government Rebates. We are subject to discount obligations under state Medicaid programs and Medicare. Reserves related to these discount obligations are recorded in the same period the related revenue is recognized, resulting in a reduction of product revenue and the establishment of a current liability. Our liability for these rebates consists of estimates of claims for the current quarter and estimated future claims that will be made for product that has been recognized as revenue but remains in the distribution channel inventories at the end of the reporting period.

Payor Rebates. We contract with certain third-party payors, primarily health insurance companies and pharmacy benefit managers, for the payment of rebates with respect to utilization of its products. These rebates are based on contractual percentages applied to the amount of product prescribed to patients who are covered by the plan or the organization with which it contracts. We estimate these rebates and record such estimates in the same period the related revenue is recognized, resulting in a reduction of product revenue and the establishment of a current liability.

Patient Assistance. Other programs that we offer include voluntary co-pay patient assistance programs intended to provide financial assistance to eligible patients with prescription drug co-payments required by payors and coupon programs for cash payors. The calculation of the current liability for this assistance is based on an estimate of claims and the cost per claim that we expect to receive associated with product that has been recognized as revenue but remains in the distribution channel inventories at the end of each reporting period.

Distribution and Other Fees. We pay distribution and other fees to certain customers in connection with the sales of our products. We record distribution and other fees paid to our customers as a reduction of revenue, unless the payment is for a distinct good or service from the customer and we can reasonably estimate the fair value of the goods or services received. If both conditions are met, we record the consideration paid to the customer as an operating expense. These costs are typically known at the time of sale, resulting in minimal adjustments subsequent to the period of sale.

Stock-based compensation

We account for stock-based compensation awards in accordance with the FASB ASC Topic 718, *Compensation — Stock Compensation (*ASC 718). ASC 718 requires all stock-based compensation awards to employees to be recognized as expense based on their grant date fair values. We use the Black-Scholes option pricing model to value our stock option and restricted stock option awards and shares issued under our employee stock purchase plan. Restricted stock units are valued at the fair market value per share of our common stock on the date of grant. We account for forfeitures of stock option awards as they occur. For awards issued to employees, we recognize compensation expense on a straight-line basis over the requisite service period, which is generally the vesting period of the award. The resulting increase or decrease in value, if any, is recognized as expense or a reduction to expense, respectively, during the period the related services are rendered. Expense for awards with performance conditions is estimated and adjusted on a quarterly basis based upon our assessment of the probability that the performance condition will be met. In January 2022, we issued awards with vesting subject to specific market conditions. The calculation of the value of awards that are subject to market conditions, as well as the derived service period for these awards, are determined using a Monte Carlo simulation. Stock based compensation for awards that are subject to a market condition is recognized based over the derived service period.

Estimating the fair value of stock option awards and shares issued under the employee stock purchase plan requires the input of subjective assumptions, including the estimated fair value of our common stock, the expected life of the option, stock price volatility, the risk-free interest rate and expected dividends. The assumptions used in our Black-Scholes option-pricing model represent management's best estimates and involve a number of variables, uncertainties and assumptions and the application of management's judgment, as they are inherently subjective. If any assumptions change, our stock-based compensation expense could be materially different in the future.

These assumptions used in our Black-Scholes option-pricing model are estimated as follows:

- *Expected Term.* Due to the lack of sufficient company-specific historical data, the expected term of employee options is determined using the "simplified" method, as prescribed in SEC's Staff Accounting Bulletin (SAB) No. 107, whereby the expected life equals the arithmetic average of the vesting term and the original contractual term of the option. The expected term of non-employee options is equal to the contractual term.

- *Expected Volatility.* The expected volatility is based on historical volatilities of similar entities within our industry which were commensurate with the expected term assumption as described in SAB No. 107.

- *Risk-Free Interest Rate.* The risk-free interest rate is based on the interest rate payable on U.S. Treasury securities in effect at the time of grant for a period that is commensurate with the assumed expected term.

- *Expected Dividends.* The expected dividend yield is 0% because we have not historically paid, and do not expect for the foreseeable future to pay, a dividend on our common stock.

The following table reflects the weighted average assumptions used to estimate the fair value of stock option awards granted and shares issued under the employee stock purchase plan during the year ended December 31, 2022.

	Year Ended December 31, 2022	
	2010 A&R Stock Incentive Plan [1]	2017 Employee Stock Purchase Plan
Risk free interest rate	2.22 %	0.17 %
Expected term (in years)	6.08	0.5
Expected volatility	73.23 %	88.13 %
Annual dividend yield	0.00 %	0.00 %

(1) Includes options granted outside the 2010 A&R Stock Incentive Plan. The grants were made pursuant to the Nasdaq inducement grant exception in accordance with Nasdaq Listing Rule 5635(c)(4).

For information about our employee stock purchase plan, see Note 14 to the Consolidated Financial Statements.

Recent Accounting Pronouncements

See Note 3 of our audited consolidated financial statements beginning on page F-1 of this Annual Report on Form 10-K for a description of recent accounting pronouncements applicable to our consolidated financial statements.

Consolidated Results of Operations

Comparison of the years ended December 31, 2022 and 2021

The following table sets forth our selected consolidated statements of operations data for the periods indicated (in thousands):

	Year Ended December 31,	
	2022	2021
Revenues:		
Net product revenues	$ 76,276	$ 73,652
Licensing revenues	—	1,000
Total revenues	76,276	74,652
Costs and expenses:		
Cost of product sales	9,263	9,151
Research and development	15,260	25,318
Selling, general and administrative	107,649	106,633
Total operating expenses	132,172	141,102
Loss from operations	(55,896)	(66,450)
Other (income) expense:		
Unrealized loss on fair value of warrants	1,211	—
Interest (income) expense	16,330	15,921
Other (income) expense	1,396	(75)
Total other (income) expense	18,937	15,846
Net loss	$ (74,833)	$ (82,296)

Net product revenues

Net product revenues related to sales of XHANCE were $76.3 million and $73.7 million for the years ended December 31, 2022 and 2021, respectively. Revenue growth was attributable primarily to an increase in average net product revenue per prescription in 2022. We believe increasing rates of payor enforcement of the utilization management criteria had a negative effect on XHANCE prescription volume growth in 2022 and may continue to have a negative effect on prescription volume in the future.

Licensing revenues

Licensing revenues were $1.0 million for the year ended December 31, 2021 as a result of payments received under the terms of the Currax License Agreement entered into in September 2019. There were no Licensing revenues for the year ended December 31, 2022.

Cost of product sales

Cost of product sales related to XHANCE were $9.3 million and $9.2 million for the years ended December 31, 2022 and 2021, respectively, with the increase attributable primarily to an increase in period costs related to the qualification of an alternative third party supplier for select components of XHANCE.

Research and development expense

Research and development expenses were $15.3 million and $25.3 million for the years ended December 31, 2022 and 2021, respectively. The $10.1 million decrease in 2022 was attributable primarily to a $10.1 million decrease in clinical expenses related to our clinical trial program in pursuit of a follow-on indication for XHANCE for the treatment of chronic sinusitis in adults in the U.S. and the FDA-mandated post-marketing pediatric study. This decrease was partially offset by a $0.3 million increase in regulatory and quality costs.

Selling, general and administrative expense

Selling, general and administrative expenses were $107.6 million and $106.6 million for the years ended December 31, 2022 and 2021, respectively. The $1.0 million increase was due primarily to a $0.8 million increase in consulting and professional fees; and a $0.2 million increase in personnel costs.

Interest (income) expense, net

Interest expense, net, was $16.3 million and $15.9 million for the years ended December 31, 2022 and 2021, respectively, which was primarily comprised of interest expense on the Pharmakon Senior Secured Notes during both periods. The increase was primarily driven by the increased interest rate on the Pharmakon Senior Secured Notes in November 2022 as a result of the A&R Note Purchase Agreement. The Company also recognized offering related expenses and an unrealized loss on the fair value of liability classified warrants issued as part of an underwritten public offering during the year ended December 31, 2022.

Liquidity and Capital Resources

Since inception, we have incurred significant net losses and expect to continue to incur net losses for the foreseeable future. We incurred net losses of $74.8 million and $82.3 million for the years ended December 31, 2022 and 2021, respectively. As of December 31, 2022, we had an accumulated deficit of $684.9 million. We have funded our operations primarily through the sale of stock and the issuance of debt, as well as through licensing revenues received under the terms of our license agreements and revenues from sales of XHANCE. As of December 31, 2022, we had $94.2 million in cash and cash equivalents.

The following table shows a summary of our cash flows for the periods indicated (in thousands):

	Year Ended December 31,	
	2022	2021
Net cash used in operating activities	$ (67,651)	$ (76,935)
Net cash used in investing activities	(63)	(62)
Net cash provided by financing activities	51,436	43,320
Effects of exchange rates on cash and cash equivalents	7	13
Net decrease in cash and cash equivalents	$ (16,271)	$ (33,664)

Operating activities

Cash used in operating activities decreased by $9.3 million, from $76.9 million for the year ended December 31, 2021 to $67.7 million for the year ended December 31, 2022. The decrease in cash used in operating activities was attributable primarily to decreased operating expenses and the timing of payment of those expenses.

Investing activities

Cash used in investing activities increased from the year ended December 31, 2021 to the year ended December 31, 2022. The increase in cash used in investing activities was attributable to proceeds from the sale of property and equipment in 2021 that did not recur in 2022.

Financing activities

Cash provided by financing activities for the year ended December 31, 2022, was driven primarily by net proceeds of $51.1 million from the issuance of shares of Company common stock and accompanying warrants as a result of a November 2022 underwritten public offering of 27,861,299 shares at a price of $1.89 per share.

Cash provided by financing activities for the year ended December 31, 2021, was driven primarily by net proceeds of $43.1 million from the issuance of shares of Company common stock as a result of a November 2021 underwritten public offering of 28,750,000 shares at a price of $1.60 per share.

Amended and Restated Note Purchase Agreement

On September 12, 2019 (the Closing Date), we entered into a Note Purchase Agreement with funds managed by Pharmakon Advisors, LP (Pharmakon), the investment manager of BioPharma Credit Funds (BioPharma). The Note Purchase Agreement provided us with $130.0 million in debt financing, of which $80.0 million of Pharmakon Senior Secured Notes was issued on the Closing Date, $30.0 million was issued on February 13, 2020, and $20.0 million was issued on December 1, 2020.

On August 10, 2022, we entered into a Third Amendment to the Note Purchase Agreement (the Third Amendment). The Third Amendment reduced the minimum consolidated XHANCE net sales and royalties required to be achieved under the Note Purchase Agreement for the trailing twelve-month period ending December 31, 2022 in exchange for a $0.8 million fee due on the repayment of the Pharmakon Senior Secured Notes.

On November 9, 2022, we entered into a Fourth Amendment to the Note Purchase Agreement (the Fourth Amendment). The Fourth Amendment resulted in the waiver of the minimum consolidated XHANCE net sales and royalties required to be achieved under the Note Purchase Agreement for the trailing twelve-month period ending September 30, 2022 and December 31, 2022 in exchange for a $1.3 million fee due upon repayment of the Pharmakon Senior Secured Notes.

On November 23, 2022, we amended and restated the Note Purchase Agreement (the A&R Note Purchase Agreement), among us, our subsidiaries, OptiNose US, Inc., OptiNose AS and OptiNose UK, Ltd. and BioPharma Credit PLC, as collateral agent, and the purchasers party thereto from time to time. Pursuant to the A&R Note Purchase Agreement, certain modifications to the affirmative and negative covenants, events of default and other terms were made, including, without limitation, (i) the requirement for us to deliver quarterly and annual financial statements that, commencing with our financial statements for the year ending December 31, 2023, are not subject to a "going concern" statement and (ii) the removal of certain exceptions to the negative covenants which previously permitted us to enter into certain transactions without the consent of the holders of the Pharmakon Senior Secured Notes, including permitted acquisitions, swap contracts, convertible bonds and revolving credit facilities. The financial covenants requiring us to achieve minimum trailing twelve-month consolidated XHANCE net product sales and royalties were also modified as follows (shown in millions):

Trailing Twelve-Months Ending	Requirement Prior to A&R Note Purchase Agreement	Requirement under the A&R Note Purchase Agreement
September 30, 2022	N/A	N/A
December 31, 2022	N/A	N/A
March 31, 2023	$98.75	N/A
June 30, 2023	102.50	N/A
September 30, 2023	106.25	N/A
December 31, 2023	110.00	N/A
March 31, 2024	113.75	$82.50
June 30, 2024	117.50	90.00
September 30, 2024	N/A	102.50
December 31, 2024	N/A	110.00
March 31, 2025	N/A	115.00
June 30, 2025	N/A	120.00
September 30, 2025	N/A	125.00
December 31, 2025	N/A	130.00
March 31, 2026	N/A	135.00
June 30, 2026	N/A	140.00
September 30, 2026	N/A	145.00
December 31, 2026	N/A	150.00
March 31, 2027	N/A	155.00
June 30, 2027	N/A	160.00
September 30, 2027	N/A	165.00

The A&R Note Purchase Agreement provided for an extension of the maturity date of the Pharmakon Senior Secured Notes from September 12, 2024 to June 30, 2027 (New Maturity Date), an extension of the interest-only period from September 2023 to September 2025, after which principal repayments will commence starting on September 30, 2025 and would be made in eight equal quarterly installments of principal and interest through the New Maturity Date. As part of the A&R Note Purchase Agreement the Pharmakon Senior Secured Notes now bear an amended interest rate through the New Maturity Date equal to the 3-month Secured Overnight Financing Rate (subject to a 2.50% floor), determined as of the date that is two business days prior to the commencement of each quarter, plus 8.50% per annum, which interest rate shall be increased by an additional 3.00% per annum upon the occurrence and during the continuation of any event of default.

In conjunction with the A&R Note Purchase Agreement, a modification was made to the "make-whole" premium payment due in connection with any principal prepayments (whether mandatory or voluntary) made prior to the 3-year anniversary of the date of the A&R Note Purchase Agreement. On any such prepayment date, we will be required to pay a make-whole premium in the amount of (i) for any prepayment date occurring up until and including the 18-month anniversary of the date of the A&R Note Purchase Agreement, the foregone interest from such prepayment date through the 18-month anniversary of such prepayment date; and (ii) for any prepayment after the 18-month anniversary of the date of the A&R Note Purchase Agreement, the foregone interest from such prepayment date through the 3-year anniversary of the date of the A&R Note Purchase Agreement; provided, however, that in no event shall the amount of all make-whole premium payments exceed $24.0 million in the aggregate;

As an inducement for the holders of the Pharmakon Senior Secured Notes to enter into the A&R Note Purchase Agreement, we will be required to pay the holders of the Pharmakon Senior Secured Notes an amendment fee of $3.9 million (representing 3.00% of the outstanding principal balance of such notes) due on the New Maturity Date or the earlier repayment of the Pharmakon Senior Secured Notes, which amendment fee shall be (i) reduced to $1.3 million in the event that we repay the Pharmakon Senior Secured Notes in full prior to the one-year anniversary of the date of the A&R Note Purchase Agreement and (ii) reduced to $2.6 million in the event that we repay the Pharmakon Senior Secured Notes in full on or after the one-year anniversary of the date of the A&R Note Purchase Agreement and prior to second anniversary of the date of the A&R Note Purchase Agreement. Additionally, the $1.3 million fee payable under the Fourth Amendment to the Note Purchase Agreement that we entered into on November 9, 2022 will be credited against the amendment fee payable in connection with the A&R Note Purchase Agreement.

Projected 2023 operating expenses

We expect that our total operating expenses, consisting of selling, general & administrative expenses and research & development expenses for 2023 will be between $90.0 million and $95.0 million of which approximately $8.0 million is expected to be stock-based compensation expense. As a result, total GAAP operating expenses excluding stock-based compensation expense are expected to be between $82.0 million and $87.0 million. The $90.0 million to $95.0 million range is approximately a $30.0 million reduction compared to 2022, of which approximately half is related to reductions in sales and marketing. The decrease in selling, general, and administrative expenses from 2022 to 2023 is anticipated as the result of actions taken to reduce near-term employee-related and third party expenses while preserving necessary capabilities to launch XHANCE as a treatment for patients with chronic sinusitis. In addition, the completion in 2022 of our clinical trial program in pursuit of a follow-on indication for XHANCE for the treatment of chronic sinusitis is the primary driver of an expected decrease in research and development expenses.

Future funding requirements

We expect to continue to incur significant expenses in connection with our ongoing activities, particularly as we:

- continue advertising and other promotional activities to support the commercialization of XHANCE;
- continue to provide co-pay and other patient affordability programs for XHANCE;
- continue clinical development activities for XHANCE, including studies mandated under the Pediatric Research Equity Act, and activities in pursuit of a follow-on indication for the treatment of chronic sinusitis;
- evaluate product candidates;
- continue to contract to manufacture XHANCE;
- maintain and protect our patent portfolio;
- service our debt obligations under the Pharmakon Senior Secured Notes;
- maintain infrastructure necessary to operate as a publicly-traded, commercial-stage company; and
- hire additional staff and add operational, financial and information systems to execute our business plan.

Our future funding requirements, both near and long-term, will depend on many factors, including, but not limited to:

- the success of our commercialization of XHANCE for the treatment of nasal polyps including, among other things, continued patient and physician adoption of XHANCE and our ability to maintain adequate insurance coverage and reimbursement for XHANCE;
- the outcome, timing and cost of the FDA regulatory approval process of XHANCE for chronic sinusitis, including the potential for the FDA to require that we perform additional studies and clinical trials;
- the cost of commercialization activities for XHANCE, including product manufacturing, distribution, marketing and sales;
- net product revenues received from sales of XHANCE;
- the level of co-pay assistance and other patient affordability programs offered for XHANCE;
- our clinical development plans for XHANCE, including the outcome, timing and cost studies mandated under the Pediatric Research Equity Act, and activities in pursuit of a follow-on indication for the treatment of chronic sinusitis;
- the costs involved in preparing, filing and prosecuting patent applications and annuity fees relating to issued patents;
- the cost of maintaining and enforcing our intellectual property rights, as well as the cost of defending intellectual property disputes, including patent infringement actions brought by third parties against us;
- the initiation, progress, timing, costs and results of clinical trials and other research and development related to additional product candidates,
- the duration and impact of COVID-19 restrictions on our business;
- the extent to which we in-license, acquire or otherwise partner in development or commercialization of other products, product candidates or technologies; and
- our ability to maintain compliance with the financial covenants (including the requirement for us to achieve certain minimum trailing twelve-month consolidated XHANCE net sales and royalties thresholds and the requirement for us to maintain at least $30.0 million of cash and cash equivalents at all times), and the other provisions under the A&R Note Purchase Agreement, and, if needed and available from the holders of the Pharmakon Senior Secured Notes, the costs and conditions associated with obtaining a waiver or modification of such covenants or other provisions.

As of December 31, 2022, we had $94.2 million in cash and cash equivalents. We will likely require additional capital in the near term in order to maintain compliance with the financial covenants and other terms under the A&R Note Purchase Agreement and to meet the debt service obligations under our outstanding Pharmakon Senior Secured Notes and to continue to fund our operations.

Our continuation as a going concern is dependent on our ability to maintain compliance with our covenants under the A&R Note Purchase Agreement, including minimum trailing twelve-month consolidated XHANCE net sales and royalties we are required to achieve commencing with the trailing twelve months ending March 31, 2024, and our ability to generate sufficient cash flows from operations to meet our obligations and/or obtain additional capital through equity or debt financings, partnerships, collaborations, or other sources, as may be required. The A&R Note Purchase Agreement includes events of default, in certain cases subject to customary periods to cure, following which Pharmakon may accelerate all amounts outstanding pursuant to the A&R Note Purchase Agreement. The accompanying consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the settlement of liabilities and commitments in the normal course of business.

We believe it is probable that we will not achieve the trailing twelve-month minimum consolidated XHANCE net sales and royalties thresholds under the A&R Note Purchase Agreement for the initial period ending March 31, 2024, which will constitute a default under the A&R Note Purchase Agreement if we are unable to obtain a modification or waiver of such minimum consolidated XHANCE net sales and royalties threshold. Further, the A&R Note Purchase Agreement includes a requirement that commencing with the report and opinion on the consolidated financial statements commencing with the year ending December 31, 2023 and that all of our subsequent quarterly and annual financial statements, not be subject to any statement as to “going concern.” We have concluded that it is unlikely that we will be able comply with these provisions in 2024. Failure to comply with these provisions would also constitute an event of default under the A&R Note Purchase Agreement.

The A&R Note Purchase Agreement also requires us to maintain at all times a minimum of $30.0 million of cash and cash equivalents. We believe that it is probable that our existing cash and cash equivalents will not be adequate to fund our operations and maintain at least $30.0 million of cash and cash equivalents as required under the A&R Note Purchase Agreement for at least twelve- months following the filing of this Form 10-K, which will also constitute a default of the liquidity financial covenant under the A&R Note Purchase Agreement if we are unable to obtain additional capital or obtain a waiver or modification to this liquidity covenant prior to falling below such $30.0 million threshold.

In the event of any of the foregoing defaults, the holders of the Pharmakon Senior Secured Notes may declare an event of default under the A&R Note Purchase Agreement and may elect to accelerate the repayment of all unpaid principal, accrued interest and other amounts due, which may require us to delay or curtail our operations until additional funding is received. These factors raise substantial doubt about our ability to continue as a going concern. The terms of the A&R Note Purchase Agreement and the Pharmakon Senior Secured Notes, including applicable covenants, are described in Note 10. In the event we are able to maintain compliance with the financial and other covenants and terms of the A&R Pharmakon Note Purchase Agreement or obtain a waiver to or modification of such covenants, we believe our existing cash and cash equivalents will be sufficient to fund our operations and debt service obligations for approximately the next 12 months.

We will likely require additional capital in the future secured through equity or debt financings, partnerships, collaborations, or other sources in order to meet our debt service obligations, including repayment, under our outstanding senior secured notes, and to carry out our planned development and commercial activities. If additional capital is not obtained when required, we may need to delay or curtail our operations until additional funding is received.

Additionally, we may never become profitable, or if we do, may not be able to sustain profitability on a recurring basis.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are a smaller reporting company as defined by Rule 12b-2 of the Securities Exchange Act of 1934 and are not required to provide the information under this item.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The information required by Item 8 including the financial statements and notes thereto, and report of the independent registered public accounting firm thereon, are included in this Form 10-K as set forth in the “Index to Consolidated Financial Statements” on page F-1.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

Not applicable.

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 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 any controls and procedures, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the disclosure controls and procedures are met. Additionally, in designing disclosure controls and procedures, our management was required to apply its judgment in evaluating the cost-benefit relationship of possible disclosure controls and procedures. 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 may not be detected.

Our Chief Executive Officer and our Principal Financial Officer evaluated the effectiveness of our disclosure controls and procedures, as defined in Rules 13a 15(e) and 15d 15(e) under the Exchange Act, as of the end of the period covered by this report. Based on this evaluation, our Chief Executive Officer and Principal Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2022.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed to provide reasonable assurance of the reliability of financial reporting and of the preparation of financial statements for external reporting purposes, in accordance with U.S. generally accepted accounting principles.

Internal control over financial reporting includes policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect transactions and disposition of assets; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. generally accepted accounting principles, and that receipts and expenditures are being made only in accordance with the authorization of its management and directors; and (3) provide reasonable assurance regarding the prevention or timely detection of unauthorized acquisition, use, or disposition of our assets that could have a material effect on its financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of the effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies and procedures included in such controls may deteriorate.

Our management has assessed the effectiveness of our internal control over financial reporting as of December 31, 2022. In making this assessment, management used the criteria established by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control - Integrated Framework (2013). These criteria are in the areas of control environment, risk assessment, control activities, information and communication, and monitoring. Management’s assessment included extensive documentation, evaluating and testing the design and operating effectiveness of its internal controls over financial reporting.

Based on management’s processes and assessment, as described above, management has concluded that, as of December 31, 2022, our internal control over financial reporting was effective.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2022 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

Not Applicable

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not Applicable

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this item is incorporated by reference to our Proxy Statement for the 2023 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission within 120 days of the fiscal year ended December 31, 2022.

Our Board has adopted a written Code of Conduct applicable to all officers, directors and employees, which is available on our website (www.optinose.com) under "Corporate Governance" within the “Investors” section. We intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding amendment to, or waiver from, a provision of this Code of Conduct by posting such information on the website address and location specified above.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this item is incorporated by reference to our Proxy Statement for the 2023 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission within 120 days of the fiscal year ended December 31, 2022.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this item is incorporated by reference to our Proxy Statement for the 2023 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission within 120 days of the fiscal year ended December 31, 2022.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this item is incorporated by reference to our Proxy Statement for the 2023 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission within 120 days of the fiscal year ended December 31, 2022.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this item is incorporated by reference to our Proxy Statement for the 2023 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission within 120 days of the fiscal year ended December 31, 2022.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) (1) Consolidated Financial Statements.

The Consolidated Financial Statements are filed as part of this report. See the Index to the Consolidated Financial Statements on page F-1.

(2) Consolidated Financial Statement Schedule.

Schedules are omitted because they are not applicable, or are not required, or because the information is included in the Consolidated Financial Statements and Notes thereto.

(3) The exhibits listed under Item 15(b), which are incorporated herein by reference, are filed or furnished as part of this report or are incorporated into this report by reference.

(b) Exhibits.

		Incorporated by Reference			
Exhibit Number	Exhibit Description	Form	Date	Number	Filed Herewith
3.1	Fourth Amended and Restated Certificate of Incorporation of OptiNose, Inc.	8-K	10/18/17	3.1	
3.2	Amended and Restated Bylaws of OptiNose, Inc.	8-K	10/18/17	3.2	
4.1	Form of Common Stock Certificate.	S-1/A	10/3/17	4.1	

4.2	Second Amended and Restated Registration Rights Agreement, dated March 24, 2017, by and among the Registrant and certain of its stockholders.	S-1	9/18/17	4.2	
4.3	First Amendment to the Second Amended and Restated Registration Rights Agreement, dated October 2, 2017, by and among the Registrant and certain of its stockholders.	S-1/A	10/11/17	4.7	
4.4	Common Stock Warrant issued by OptiNose, Inc. dated November 16, 2021.	8-K	11/16/21	4.1	
4.5	Description of Securities of OptiNose, Inc.				x
4.6	Form of Common Stock Warrant issued by OptiNose, Inc. on November 23, 2022	8-K	11/23/22	4.1	
4.7	Warrant Agency Agreement, dated November 23, 2022, by and between OptiNose, Inc. and Broadridge Corporate Issuer Solutions, Inc.	8-K	11/23/22	4.2	
10.1	Form of Indemnification Agreement.+				x
10.2	Amended and Restated 2010 Stock Incentive Plan.+	S-1/A	10/3/17	10.7	
10.3	Form of Non-Qualified Stock Option Agreement Granted Under the 2010 Stock Incentive Plan (Relating to Success Pool Grants).+	S-1/A	10/3/17	10.8	
10.4	Form of Non-Qualified Stock Option Agreement Granted Under the 2010 Stock Incentive Plan (Relating to Option Pool Grants).+	S-1/A	10/3/17	10.9	
10.5	Form of Non-Qualified Stock Option Agreement Granted Under the 2010 Stock Incentive Plan.+	S-1/A	10/3/17	10.10	
10.6	Supply Agreement, dated July 1, 2017, by and between Hovione Inter Ltd and OptiNose US, Inc., OptiNose UK, Ltd and OptiNose AS.†	S-1	9/18/17	10.14	
10.7	Manufacture and Supply Agreement, dated as of August 18, 2017, by and among OptiNose US, Inc., OptiNose UK Ltd. and OptiNose AS and Contract Pharmaceuticals Limited Canada.†	S-1	9/18/17	10.15	
10.8	Form of Non-Qualified Stock Option Agreement Under the Amended and Restated 2010 Stock Incentive Plan+	S-1/A	10/3/17	10.17	
10.9	2017 Employee Stock Purchase Plan.+	S-1/A	10/3/17	10.18	
10.10	Manufacturing Services Agreement, dated December 21, 2018, by and among OptiNose US, Inc., OptiNose UK Ltd. and Optinose AS and Advance Mold & Manufacturing, Inc. d/b/a Vision Technical Molding.†	10-K	3/6/19	10.1	
10.11	Form of Restricted Stock Unit Agreement Under the Amended and Restated 2010 Stock Incentive Plan.+	10-Q	8/12/19	10.1	
10.12	Form of Non-Qualified Stock Option Agreement (Inducement Grant).+	8-K	2/19/20	99.3	
10.13	Amendment No.1, dated September 15, 2020, to the Manufacturing Services Agreement, dated December 21, 2018, by and among OptiNose US, Inc., OptiNose UK Ltd. and Optinose AS and Advance Mold & Manufacturing, Inc. d/b/a Vision Technical Molding. †	10-Q	11/5/20	10.1	
10.14	Form of Restricted Stock Unit Agreement (Inducement Grant).+	10-Q	5/7/20	10.4	
10.15	Renewal and Amendment No. 1, dated February 22, 2021 to Manufacture and Supply Agreement, dated as of August 18, 2017, by and among OptiNose US, Inc., OptiNose UK Ltd. and OptiNose AS and Contract Pharmaceuticals Limited Canada.	10-Q	5/5/21	10.1	
10.17	Open Market Sale Agreement (the Sale Agreement), dated August 11, 2021, between the Company and Jefferies LLC.	10-Q	8/11/21	10.1	
10.20	Amended and Restated Employment Agreement, dated March 2, 2022, between OptiNose US, Inc. and Michael F. Marino +	10-K	3/3/21	10.25	
10.21	Cooperation Agreement, dated April 25, 2022, by and among OptiNose, Inc. M. Kingdon Offshore Master Fund L.P., Velan Capital Partners LP and certain other affiliated investors listed therein	10-Q	5/12/22	10.1	
10.24	Amended and Restated Note Purchase Agreement, dated November 21, 2022, among OptiNose US, Inc., OptiNose, Inc., and OptiNose AS, BioPharma Credit PLC, as collateral agent and the purchasers from time to time party thereto.	8-K	11/21/22	10.1	
10.26	Amendment No.2, dated September 20, 2022, to the Manufacturing Services Agreement, dated December 21, 2018, by and among OptiNose US, Inc. and Advance Mold & Manufacturing, Inc. d/b/a Vision Technical Molding.	8-K	9/23/22	10.1	
10.27	Employment Agreement dated 23, between OptiNose US, Inc. and Anthony J. Krick	8-K	9/27/22	99.2	
10.29	Employment Agreement, dated December 15, 2022, between OptiNose US, Inc. and Paul Spence, Jr.	8-K	12/15/22	10.1	
10.30	Consulting Agreement, dated December 16, 2022, between OptiNose US, Inc. and Janis Consulting LLC	8-K	12/16/22	10.1	

10.31	Amended and Restated Employment Agreement, dated January 30, 2023, between OptiNose US, Inc. and Ramy A. Mahmoud	8-K	1/31/23	10.1	
10.32	Separation Agreement and Release, dated January 30, 2023, between Peter K. Miller and OptiNose US, Inc.	8-K	1/31/23	10.2	
10.33	Consulting Agreement, dated January 30, 2023, between Peter K. Miller and OptiNose US, Inc.	8-K	1/31/23	10.3	
21.1	List of Subsidiaries				x
23.1	Consent of Ernst & Young LLP, independent registered public accounting firm.				x
31.1	Certification of Chief Executive Officer pursuant to Rule 13a-14(a) or 15a-14(a) under the Exchange Act.				x
31.2	Certification of Principal Financial Officer pursuant to Rule 13a-14(a) or 15a-14(a) under the Exchange Act.				x
32.1	Certification Pursuant to 18 U.S.C. Section 1350 of principal executive officer and principal financial officer.				x
32.2	Certification Pursuant to 18 U.S.C. Section 1350 of principal executive officer and principal financial officer.				x
101.INS	XBRL Instance Document.				x
101.SCH	XBRL Taxonomy Extension Schema Document.				x
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.				x
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.				x
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.				x
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.				x
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)				x

† Portions of this exhibit (indicated by asterisks) have been omitted in compliance with Item 601 of Regulation S-K.

+ Indicates management contract or compensatory arrangement.

ITEM 16. FORM 10-K SUMMARY

Not applicable.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized in the capacities and on the date indicated.

Date: March 7, 2023

OPTINOSE, INC.
By: /s/ RAMY MAHMOUD
Name: Ramy Mahmoud
Title: *Chief Executive Officer*

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ RAMY MAHMOUD Ramy Mahmoud	Chief Executive Officer and Director (Principal Executive Officer)	March 7, 2023
/s/ ANTHONY J. KRICK Anthony J. Krick	Chief Accounting Officer (Principal Financial Officer and Principal Accounting Officer)	March 7, 2023
/s/ JOSEPH C. SCODARI Joseph C. Scodari	Chairman of the Board of Directors	March 7, 2023
/s/ WILHELMUS GROENHUYSEN Wilhelmus Groenhuysen	Director	March 7, 2023
/s/ SANDRA L. HELTON Sandra L. Helton	Director	March 7, 2023
/s/ TOMAS J. HEYMAN Tomas J. Heyman	Director	March 7, 2023
/s/ CATHERINE E. OWEN Catherine E. Owen	Director	March 7, 2023
/s/ ERIC BEDNARSKI Eric Bednarski	Director	March 7, 2023
/s/ KYLE DEMPSEY Kyle Dempsey	Director	March 7, 2023
/s/ R. JOHN FLETCHER R. John Fletcher	Director	March 7, 2023

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Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors of OptiNose, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of OptiNose, Inc. (the Company) as of December 31, 2022 and 2021, the related consolidated statements of operations, 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, 2022 and 2021, and the results of its operations and its cash flows for the years then ended, in conformity with U.S. generally accepted accounting principles.

The Company's Ability to Continue as a Going Concern

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 2 to the consolidated financial statements, the Company has incurred recurring losses from operations, has a working capital deficiency and expects to not be in compliance with certain debt covenants, and has stated that substantial doubt exists about the Company's ability to continue as a going concern. Management's evaluation of the events and conditions and management's plans regarding these matters are also described in Note 2. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's 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 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 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters 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 matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Product revenue allowances for payor rebates and patient assistance programs

Description of the matter

The Company sells XHANCE to preferred pharmacy network partners and wholesalers in the US (collectively, "Customers"). As described in Note 3 to the consolidated financial statements, the Company recognizes revenues for sales of XHANCE to its Customers reduced by estimates of variable consideration, including payor rebates to health insurance companies and pharmacy benefit managers ("payor rebates"), and incentives offered under voluntary patient assistance programs to provide financial assistance to qualified patients ("patient assistance"). Liabilities related to these reductions to gross product revenues are presented within accrued expenses on the consolidated balance sheet. The determination of these estimates of variable consideration at December 31, 2022, requires management to make estimates and assumptions about the amounts of rebates and incentives that will be payable by the Company as a result of the sale of products for which control has transferred.

How we addressed the matter in our audit

To test the estimates of variable consideration for payor rebates and the patient assistance programs, we performed audit procedures that included, among others, evaluating the methodologies used, testing the significant assumptions and testing the completeness and accuracy of the underlying data used by the Company in its analyses. Specifically, for variable consideration for payor rebates, we compared the significant assumptions to third party reports used by the Company to estimate product remaining in the distribution channel at December 31, 2022, historical payor mix data for XHANCE, and the applicable contractual rebate percentages. In addition, we inspected the underlying payor rebate agreements and compared the rebate percentages used in the Company's analyses with the contractual percentages. For variable consideration for patient assistance, we compared the significant assumptions to third party reports used by the Company to estimate product remaining in the distribution channel at December 31, 2022, historical data related to the percentage of patients receiving patient assistance, and the historical data about the average amount of assistance received. For both patient assistance and payor rebates, we assessed the historical accuracy of management's estimates by comparing previous estimates of payor rebates and patient assistance to the amount of actual payments in subsequent periods.

Valuation of warrant liability

Description of the matter

The Company's warrant liability totaled $21.5 million as of December 31, 2022. As discussed in Note 13 to the consolidated financial statements, certain warrants for the purchase of shares of common stock issued by the Company require liability classification and are recorded at fair value at each reporting period. The Company determines the fair value of the warrants utilizing a Monte Carlo simulation model. Auditing the Company's valuation of its warrant liability was especially challenging as the fair value is based on various inputs and significant assumptions used in the Monte Carlo simulation model such as the probability and timing of equity financing and volatility. In addition, certain of the assumptions were based on management's judgement, and therefore are not objectively verifiable.

How we addressed the matter in our audit

To test the warrant liability, our audit procedures included, among others, testing the Monte Carlo simulation model, and assessing the reasonableness of the significant assumptions, as described above. We involved valuation specialists to assess the valuation models and to assist in auditing certain significant assumptions. We tested the significant assumptions by agreeing amounts to contracts, third-party data and analyses prepared by the Company. In addition, we performed sensitivity analyses to evaluate the materiality of reasonable changes in management's assumptions.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2016.

Philadelphia, Pennsylvania

March 7, 2023

OptiNose, Inc.
Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31, 2022	December 31, 2021
Assets		
Current assets:		
Cash and cash equivalents	$ 94,244	$ 110,502
Accounts receivable, net	33,932	35,449
Inventory	9,443	11,847
Prepaid expenses and other current assets	2,865	2,581
Total current assets	140,484	160,379
Property and equipment, net	795	1,347
Other assets	2,943	4,345
Total assets	$ 144,222	$ 166,071
Liabilities and stockholders' deficit		
Current liabilities:		
Accounts payable	$ 5,291	$ 8,013
Accrued expenses and other current liabilities	44,864	51,222
Short term debt, net	128,575	—
Total current liabilities	178,730	59,235
Long-term debt, net	—	126,418
Warrant liability	21,490	—
Other liabilities	626	2,190
Total liabilities	200,846	187,843
Stockholders' deficit:		
Common stock, $0.001 par value; 200,000,000 shares authorized at December 31, 2022 and 2021; 111,492,761 and 82,238,900 shares issued and outstanding at December 31, 2022 and December 31, 2021, respectively	111	82
Additional paid-in capital	628,242	588,288
Accumulated deficit	(684,893)	(610,061)
Accumulated other comprehensive loss	(84)	(81)
Total stockholders' deficit	(56,624)	(21,772)
Total liabilities and stockholders' deficit	$ 144,222	$ 166,071

See accompanying notes to consolidated financial statements

OptiNose, Inc.
Consolidated Statements of Operations
(in thousands, except share and per share data)

	Year Ended December 31,	
	2022	**2021**
Revenues:		
Net product revenues	$ 76,276	$ 73,652
Licensing revenues	—	1,000
Total revenues	76,276	74,652
Costs and expenses:		
Cost of product sales	9,263	9,151
Research and development	15,260	25,318
Selling, general and administrative	107,649	106,633
Total costs and expenses	132,172	141,102
Loss from operations	(55,896)	(66,450)
Other (income) expense:		
Unrealized loss on fair value of warrants	1,211	—
Other (income) expense	1,396	(75)
Interest income	(513)	(52)
Interest expense	16,843	15,973
Net loss	$ (74,833)	$ (82,296)
Net loss per share of common stock, basic and diluted	$ (0.87)	$ (1.45)
Weighted average common shares outstanding, basic and diluted	85,900,139	56,851,921

See accompanying notes to consolidated financial statements

OptiNose, Inc.
Consolidated Statements of Comprehensive Loss
(in thousands)

	Year Ended December 31,	
	2022	2021
Net loss	$ (74,833)	$ (82,296)
Other comprehensive loss:		
Foreign currency translation adjustment	(3)	4
Comprehensive loss	$ (74,836)	$ (82,292)

See accompanying notes to consolidated financial statements

OptiNose, Inc.
Consolidated Statements of Changes in Stockholders' Equity (Deficit)
(in thousands, except share data)

	Stockholders' Equity (Deficit)					
	Common Stock		Additional Paid -in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Stockholders' Equity (Deficit)
	Shares	Amount				
Balance at December 31, 2020	52,945,865	$ 53	$ 534,585	$ (527,765)	$ (85)	$ 6,788
Stock compensation expense	—	—	9,977	—	—	9,977
Vesting of restricted stock units	383,631	—	—	—	—	—
Sale of common stock, net of issuance costs	28,750,000	29	42,785	—	—	42,814
Issuance of warrants in connection with Pharmakon Second Amendment, net of cancellation	—	—	534	—	—	534
Exercise of common stock options	23,879	—	39	—	—	39
Issuance of common stock under employee stock purchase plan	135,525	—	368	—	—	368
Foreign currency translation adjustment	—	—	—	—	4	4
Net loss	—	—	—	(82,296)	—	(82,296)
Balance at December 31, 2021	82,238,900	$ 82	$ 588,288	$ (610,061)	$ (81)	$ (21,772)
Stock compensation expense			8,889			8,889
Vesting of restricted stock units	949,857	1	93	—	—	94
Sale of common stock, net of issuance costs	27,861,300	28	30,418	—	—	30,446
Exercise of common stock options	55,360	—		—	—	—
Issuance of common stock under employee stock purchase plan	387,344	—	554	—	—	554
Foreign currency translation adjustment	—	—	—	—	(3)	(3)
Net loss	—	—	—	(74,833)	—	(74,833)
Balance at December 31, 2022	111,492,761	$ 111	$ 628,242	$ (684,893)	$ (84)	$ (56,624)

See accompanying notes to consolidated financial statements

OptiNose, Inc.
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31,	
	2022	2021
Operating activities:		
Net loss	$ (74,833)	$ (82,296)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	532	646
Stock-based compensation	8,877	10,003
Change in fair value of warrant liability	1,211	—
Amortization of debt discount and issuance costs	2,318	1,795
Allowance for doubtful accounts	—	(233)
Gain on sale of equipment	—	(67)
Changes in operating assets and liabilities:		
Accounts receivable	1,517	(11,823)
Grants and other receivables	—	43
Prepaid expenses and other assets	1,963	3,543
Inventory	2,492	(2,713)
Accounts payable	(2,723)	2,564
Accrued expenses and other liabilities	(9,005)	1,603
Cash used in operating activities	(67,651)	(76,935)
Investing activities:		
Purchases of property and equipment	(63)	(167)
Proceeds from sale of property and equipment	—	105
Cash used in investing activities	(63)	(62)
Financing activities:		
Proceeds from the sale of common stock and warrants	51,086	43,140
Proceeds from the issuance of common stock under employee stock purchase plan	554	368
Proceeds from the exercise of stock options	94	39
Cash paid for financing costs	(298)	(227)
Cash provided by financing activities	51,436	43,320
Effects of exchange rate changes on cash and cash equivalents	7	13
Net decrease in cash, cash equivalents and restricted cash	(16,271)	(33,664)
Cash, cash equivalents and restricted cash at beginning of period	110,515	144,179
Cash, cash equivalents and restricted cash at end of period	$ 94,244	$ 110,515
Supplemental disclosure of cash flow information:		
Cash paid for interest	$ 15,091	$ 14,170
Supplemental disclosure of noncash activities:		
Fixed asset purchases within accounts payable and accrued expenses	$ 4	$ 11
Fair value of warrants issued	$ —	$ 534
Financing costs within accounts payable and accrued expenses	$ 408	$ 318
Recognition of right-of-use assets and lease liabilities	$ 704	$ 157

See accompanying notes to consolidated financial statements

OptiNose, Inc.
Notes to Consolidated Financial Statements
(in thousands, except share and per share data)

1. Organization and Description of Business

OptiNose, Inc. (the Company) was incorporated in Delaware in May 2010 (inception) and has facilities in Yardley, Pennsylvania and Ewing, New Jersey. The Company's predecessor entity, OptiNose AS, was formed under the laws of Norway in September 2000. In 2010, OptiNose AS became a wholly-owned subsidiary of the Company as part of an internal reorganization. During 2022, the Company's board of directors approved the liquidation of Optionse AS and Optinose UK, which is expected to be completed in 2023, in order to simplify the corporate structure.

The Company is a specialty pharmaceutical company focused on the development and commercialization of products for patients treated by ear, nose and throat (ENT) and allergy specialists. The Company's first commercial product, XHANCE® (fluticasone propionate) nasal spray, 93 microgram (mcg), is a therapeutic utilizing the Company's proprietary Exhalation Delivery System (EDS) that delivers a topically-acting corticosteroid for the treatment of chronic rhinosinusitis with nasal polyps and, if approved, chronic rhinosinusitis without nasal polyps (also known as chronic sinusitis). XHANCE was approved by the United States (US) Food and Drug Administration (FDA) in September 2017 for the treatment of nasal polyps in patients 18 years of age or older. XHANCE was made widely available through commercial channels in April 2018. In January 2023, the indication statement for XHANCE was changed from “for the treatment of nasal polyps” to “for the treatment of chronic rhinosinusitis with nasal polyps” to reflect current FDA labeling terminology and not based on new XHANCE clinical trial data.

2. Liquidity

Since inception, the Company's operations have focused on organization and staffing, business planning, raising capital, establishing an intellectual property portfolio, conducting preclinical studies and clinical trials, pursuing regulatory approvals and most recently, launching XHANCE in the US. As of December 31, 2022, the Company had cash and cash equivalents of $94,244 and a working capital deficiency of $38,246.

The Company is subject to a number of risks similar to other life sciences companies, including successful discovery, development and commercialization of its products and product candidates, raising additional capital, the development by its competitors of new technological innovations, protection of proprietary technology and market acceptance of the Company's products. The Company has incurred recurring net losses since its inception and has accumulated a deficit of $684,893 as of December 31, 2022.

The Company entered into a Note Purchase Agreement (the Note Purchase Agreement) on September 12, 2019 with funds managed by Pharmakon Advisors, LP (Pharmakon), the investment manager of the BioPharma Credit Funds (BioPharma) which was subsequently amended on August 13, 2020, March 2, 2021, November 16, 2021, August 10, 2022, and November 9, 2022. On November 23, 2022, the Company amended and restated the Note Purchase Agreement (the A&R Note Purchase Agreement). Pursuant to the A&R Note Purchase Agreement, the financial covenants requiring the Company to achieve minimum trailing twelve-month consolidated XHANCE net product sales and royalties were modified (See Note 10). The principal balance outstanding under the A&R Note Purchase Agreement was $130 million at December 31, 2022.

The Company's continuation as a going concern is dependent on its ability to maintain compliance with its covenants under the A&R Note Purchase Agreement, including minimum trailing twelve-month consolidated XHANCE net sales and royalties the Company is required to achieve commencing with the trailing twelve months ending March 31, 2024 and its ability to generate sufficient cash flows from operations to meet its obligations and/or obtain additional capital through equity or debt financings, partnerships, collaborations, or other sources, as may be required. The A&R Note Purchase Agreement includes events of default, in certain cases subject to customary periods to cure, following which Pharmakon may accelerate all amounts outstanding pursuant to the Note Purchase Agreement. The accompanying consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the settlement of liabilities and commitments in the normal course of business.

The A&R Note Purchase Agreement also requires the Company to maintain at all times a minimum of $30,000 of cash and cash equivalents. The Company believes that it is probable that its existing cash and cash equivalents will not be adequate to fund its operations and maintain at least $30,000 of cash and cash equivalents as required

under the A&R Note Purchase Agreement for at least twelve-months following the filing of this Form 10-K, which will also constitute a default of the liquidity financial covenant under the A&R Note Purchase Agreement if the Company is unable to obtain additional capital or obtain a waiver or modification to this liquidity covenant prior to falling below such $30,000 threshold.

The Company also believes it is probable that it will not achieve the trailing twelve-month minimum consolidated XHANCE net sales and royalties thresholds under the A&R Note Purchase Agreement for the initial period ending March 31, 2024, which will constitute a default under the A&R Note Purchase Agreement if the Company is unable to obtain a modification or waiver of such minimum consolidated XHANCE net sales and royalties thresholds.

Further, the A&R Note Purchase Agreement includes a requirement that the report and opinion on the consolidated financial statements commencing with the year ending December 31, 2023, not be subject to any statement as to "going concern." In addition, the consolidated financial statements commencing with the quarter ended March 31, 2024, shall also not be subject to any statement as to "going concern." The Company has concluded that it is unlikely that it will be able comply with these provisions in 2024. Failure to comply with these provisions would also constitute an event of default under the A&R Note Purchase Agreement.

In the event of any of the foregoing defaults, the holders of the Pharmakon Senior Secured Notes may declare an event of default under the A&R Note Purchase Agreement and may elect to accelerate the repayment of all unpaid principal, accrued interest and other amounts due, which may require the Company to delay or curtail its operations until additional funding is received. The terms of the A&R Note Purchase Agreement and the Pharmakon Senior Secured Notes, including applicable covenants, are described in Note 10.

Management's plans to mitigate this risk may include reducing expenses, raising additional capital through equity or debt financings, partnerships, collaborations or other sources and requesting a modification or waiver of the covenants under the A&R Note Purchase Agreement. However, there can be no assurance that the Company will be successful in reducing expenses, raising additional capital, or obtaining a modification or waiver of the covenants under the A&R Note Purchase Agreement. If the Company is unable to reduce expenses, raise additional capital or obtain a modification or waiver of the covenants under the A&R Note Purchase Agreement, the Company may need to delay or curtail its operations. As a result of these factors, management has concluded that substantial doubt exists about the Company's ability to continue as a going concern within one year after the date these consolidated financial statements are issued.

3. Summary of Significant Accounting Policies

Basis of presentation

The accompanying consolidated financial statements have been prepared in conformity with US generally accepted accounting principles (GAAP). Any reference in these notes to applicable guidance is meant to refer to GAAP as found in the Accounting Standards Codification (ASC) and Accounting Standards Updates (ASU) of the Financial Accounting Standards Board (FASB).

Principles of consolidation

The consolidated financial statements include the accounts of OptiNose, Inc. and its wholly-owned subsidiaries, OptiNose US, Inc., OptiNose AS and OptiNose UK Ltd. All inter-company balances and transactions have been eliminated in consolidation.

Use of estimates

The preparation of the consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and reported amounts of expenses during the reporting period. Due to the uncertainty of factors surrounding the estimates or judgments used in the preparation of the consolidated financial statements, actual results may materially vary from these estimates. Estimates and assumptions are periodically reviewed and the effects of revisions are reflected in the consolidated financial statements in the period they are determined to be necessary.

Concentration of credit risk

Financial instruments that potentially subject the Company to concentrations of credit risk are primarily cash and accounts receivable. The Company generally invests its cash in deposits with high credit quality financial institutions. Additionally, the Company performs periodic evaluations of the relative credit standing of these financial institutions.

Customer and supplier concentration

The Company has exposure to credit risk in accounts receivable from sales of product. XHANCE is sold to wholesale pharmaceutical distributors and preferred pharmacy network (PPN) partners, who, in turn, sell XHANCE to pharmacies, hospitals and other customers. Five customers represented approximately 52% of the Company's accounts receivable at December 31, 2022 and five customers represented approximately 33% of the Company's net product sales for the year ended December 31, 2022.

The Company purchases XHANCE and its components from several third-party suppliers and manufacturing partners, certain of which are available through a single source. Although the Company could obtain each of these components from alternative third-party suppliers, it would need to qualify and obtain FDA approval for another supplier as a source for each such component. The Company has initiated the process of qualifying an alternate third-party supplier for select components of XHANCE. Alternate third party suppliers of XHANCE components are subject to qualification and approval from the FDA.

Cash and cash equivalents

All highly liquid investments purchased with an original maturity date of three months or less at the date of purchase are considered to be cash equivalents. The Company maintains its cash and cash equivalent balances at foreign and domestic financial institutions. Bank deposits with Norwegian banks are insured up to approximately 2,000 Norwegian krone by the Norwegian Banks' Guarantee Fund. Bank deposits with US banks are insured up to $250 by the Federal Deposits Insurance Corporation. The Company had uninsured cash balances of $92,988 and $109,017 at December 31, 2022 and 2021, respectively.

Fair value of financial instruments

The Company measures certain assets and liabilities at fair value, which is defined as the price that would be received to sell an asset or paid to transfer a liability (the exit price) in an orderly transaction between market participants at the measurement date. The FASB accounting guidance outlines a valuation framework and creates a fair value hierarchy in order to increase the consistency and comparability of fair value measurements and the related disclosures. In determining fair value, the Company uses quoted prices and observable inputs. Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from independent sources. The fair value hierarchy is broken down into three levels based on the source of the inputs as follows:

- Level 1 — Valuations based on unadjusted quoted prices in active markets for identical assets or liabilities.
- Level 2 — Valuations based on observable inputs (other than Level 1 quoted prices), such as quoted prices in active markets for similar assets or liabilities, quoted prices in markets that are not active for identical or similar assets or liabilities, or other inputs that are observable or can be corroborated by observable market data.
- Level 3 — Valuations based on inputs that are unobservable and models that are significant to the overall fair value measurement.

At December 31, 2022 and 2021, the Company's financial instruments included cash and cash equivalents, accounts receivable, grants receivable, accounts payable, accrued expenses and certain liability classified warrants. The carrying amounts reported in the Company's financial statements for cash and cash equivalents, accounts receivable, grants receivable, accounts payable and accrued expenses approximates their respective fair values because of the short-term nature of these instruments. In addition, at December 31, 2022, the Company believed

(in thousands, except share and per share data)

the carrying value of debt approximates fair value as the interest rates were reflective of the rate the Company could obtain on debt with similar terms and conditions. At December 31, 2022 and 2021, there were no financial assets or liabilities measured at fair value on a recurring basis other than the liability classified warrants shown below.

In November 2022, the Company issued warrants in connection with the a public offering. Pursuant to the terms of the warrant agreement, the Company could be required to settle the warrants in cash in the event of an acquisition of the Company and, as a result, the warrants are required to be measured at fair value and reported as liability in the consolidated balance sheet. The Company recorded the fair value of the warrants upon issuance using a Monte Carlo simulation and is required to revalue the warrants at each reporting date with any changes in fair value recorded on our statement of operations. The valuation of the warrants is considered under Level 3 of the fair value hierarchy due to the need to use assumptions in the valuation that are both significant to the fair value measurement and unobservable. The change in the fair value of the Level 3 warrants liabilities is reflected in the statement of operations for the years ended December 31, 2022.

Accounts receivable

Accounts receivable primarily relates to amounts due from customers, which are typically due within 31 to 61 days. The Company analyzes accounts that are past due for collectability. There was no allowance for doubtful accounts related to customers subject to credit risk at December 31, 2022. The Company recognized an allowance for doubtful accounts related to customers subject to credit risk of $444 at December 31, 2021. The accounts receivable balance at December 31, 2021 on the accompanying balance sheet is net of the allowance.

Inventory

Inventories are stated at the lower of cost or net realizable value. Costs of inventories, which include amounts related to materials and manufacturing overhead, are determined on a first-in, first-out basis. An assessment of the recoverability of capitalized inventory is performed during each reporting period and any excess and obsolete inventories are written down to their estimated net realizable value in the period in which the impairment is first identified.

Property and equipment

Property and equipment is recorded at cost less accumulated depreciation. Significant additions or improvements are capitalized and expenditures for repairs and maintenance are charged to expense as incurred. Gains and losses on disposal of assets are included in the consolidated statements of operations. Depreciation is calculated on a straight-line basis over the estimated useful lives of the respective assets.

The estimated useful lives of property and equipment are as follows:

Computer equipment	2-3 years
Software	3 years
Machinery & production equipment	5-10 years
Furniture & fixtures	3-5 years
Leasehold improvements	Shorter of lease term or useful life

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 future net cash flows expected to be generated. Impairment charges are recognized at the amount by which the carrying amount of an asset exceeds the fair value of the asset. Assets to be disposed of are reported at the lower of the carrying amount or the fair value less costs to sell. The Company did not recognize any impairment or disposition of long-lived assets for the years ended December 31, 2022 and 2021.

Leases

At the inception of an arrangement, the Company determines whether the arrangement is or contains a lease based on the terms of the arrangement. The Company accounts for a contract as a lease when it has the right to control the asset for a period of time while obtaining substantially all of the asset's economic benefits. The Company determines the initial classification and measurement of its operating right-of-use ("ROU") assets and operating lease liabilities at the lease commencement date, and thereafter if modified. The lease term includes any renewal options that the Company is reasonably assured to exercise. The Company's policy is to not record leases with a lease term of 12 months or less on its balance sheets.

The ROU asset represents the right to use the leased asset for the lease term. The lease liability represents the present value of the lease payments under the lease. The present value of lease payments is determined by using the interest rate implicit in the lease, if that rate is readily determinable; otherwise, the Company uses its estimated secured incremental borrowing rate for that lease term. Lease expense for operating leases is recognized on a straight-line basis over the reasonably assured lease term based on the total lease payments and is included in operating expense in the statements of operations.

Payments due under each lease agreement include fixed and variable payments. Variable payments relate to the Company's share of the lessor's operating costs associated with the underlying asset and are recognized when the event on which those payments are assessed occurs. Variable payments have been excluded from the lease liability and associated right-of-use asset.

The interest rate implicit in lease agreements is typically not readily determinable, and as such, the Company utilizes the incremental borrowing rate to calculate lease liabilities, which is the rate incurred to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment.

Net product revenues

The Company accounts for revenue in accordance with ASC Topic 606, *Revenue from Contracts with Customers* (ASC 606), which was adopted on January 1, 2018. The Company performs the following five steps to recognize revenue under ASC 606: (i) identify the contract(s) 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 recognizes revenue when it is probable that it will collect the consideration to which it is entitled in exchange for the goods or services that will be transferred to the customer.

The Company sells XHANCE to preferred pharmacy network partners and wholesalers in the US (collectively, Customers). These Customers subsequently resell the Company's products to healthcare providers, patients and other retail pharmacies. In addition to agreements with Customers, the Company enters into arrangements with healthcare providers and payors that provide for government-mandated and/or privately-negotiated rebates, chargebacks and discounts for the purchase of the Company's products.

The Company recognizes revenue from XHANCE sales at the point Customers obtain control of the product, which generally occurs upon delivery. The transaction price that is recognized as revenue for products includes an estimate of variable consideration which is described below. Payment terms with Customers do not exceed one year and, therefore, the Company does not account for a financing component in its arrangements. The Company expenses incremental costs of obtaining a contract with a Customer (for example, sales commissions) when incurred as the period of benefit is less than one year. Shipping and handling costs for product shipments to Customers are recorded as selling, general and administrative expenses.

Transaction Price, including Estimates of Variable Consideration

Revenue from products is recognized at the estimated net sales price (transaction price), which includes estimates of variable consideration. The Company includes estimated amounts in the transaction price to the extent it is determined probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. The Company's estimates of variable consideration and determination of whether to include estimated amounts in the transaction price are based largely on an assessment

of its anticipated performance and all information (historical, current and forecasted) that is reasonably available. The components of the Company's variable consideration include the following:

- Provider Chargebacks and Discounts. Chargebacks for fees and discounts to providers represent the estimated obligations resulting from contractual commitments to sell products to qualified healthcare providers at prices lower than the list prices charged to Customers who directly purchase the product from the Company. Customers charge the Company for the difference between what they pay for the product and the ultimate selling price to the qualified healthcare providers. These components of variable consideration are established in the same period that the related revenue is recognized, resulting in a reduction of product revenue and accounts receivable.
- Trade Discounts and Allowances. The Company generally provides Customers with discounts that include incentive fees which are explicitly stated in the Company's contracts. These discounts are recorded as a reduction of revenue and accounts receivable in the period in which the related product revenue is recognized.
- Product Returns. Consistent with industry practice, the Company has a product returns policy that provides Customers a right of return for product purchased within a specified period prior to and subsequent to the product's expiration date. The Company estimates the amount of its products that may be returned and presents this amount as a reduction of revenue in the period the related product revenue is recognized, in addition to establishing a current liability. The Company considers several factors in the estimation process, including expiration dates of product shipped to Customers, inventory levels within the distribution channel, product shelf life, prescription trends and other relevant factors.
- Government Rebates. The Company is subject to discount obligations under state Medicaid programs and Medicare. Reserves related to these discount obligations are recorded in the same period the related revenue is recognized, resulting in a reduction of product revenue and the establishment of a current liability. The Company's liability for these rebates consists of estimates of claims for the current reporting period and estimated future claims that will be made for product that has been recognized as revenue but remains in the distribution channel inventories at the end of the reporting period.
- Payor Rebates. The Company contracts with certain third-party payors, primarily health insurance companies and pharmacy benefit managers, for the payment of rebates with respect to utilization of its products. These rebates are based on contractual percentages applied to the amount of product prescribed to patients who are covered by the plan or the organization with which it contracts. The Company estimates these rebates and records such estimates in the same period the related revenue is recognized, resulting in a reduction of product revenue and the establishment of a current liability.
- Patient Assistance. Other programs that the Company offers include voluntary co-pay patient assistance programs intended to provide financial assistance to eligible patients with prescription drug co-payments required by payors and coupon programs for cash payors. The calculation of the current liability for this assistance is based on an estimate of claims and the cost per claim that the Company expects to receive associated with product that has been recognized as revenue but remains in the distribution channel inventories at the end of each reporting period.
- Distribution and Other Fees. We pay distribution and other fees to certain customers in connection with the sales of our products. We record distribution and other fees paid to our customers as a reduction of revenue, unless the payment is for a distinct good or service from the customer and we can reasonably estimate the fair value of the goods or services received. If both conditions are met, we record the consideration paid to the customer as an operating expense. These costs are typically known at the time of sale, resulting in minimal adjustments subsequent to the period of sale.

Licensing Revenues

The Company has a license agreement with Currax Pharmaceuticals LLC (Currax) (Note 9). This license agreement provides for exclusive licensed rights to certain intellectual property, a non-refundable up-front payment, potential

milestone payment(s) and potential royalty payment(s). The Company analyzed the performance obligations under the license agreement, the consideration received to date and the consideration the Company could receive in the future as part of its analysis related to ASC 606. There was no licensing revenue recognized during the year ended December 31, 2022. The Company recognized $1,000 as licensing revenue during the year ended December 31, 2021.

Advertising expenses

The Company expenses the costs of advertising, including promotional expenses, as incurred. Advertising expenses were $16,575 and $15,638 for the years ended December 31, 2022 and 2021, respectively.

Research and development

Research and development costs are expensed as incurred. Research and development costs consist primarily of device development, clinical trial related costs and regulatory related costs. The Company enters into agreements with contract research organizations (CROs) to facilitate, coordinate and perform agreed upon research and development activities for the Company's clinical trials. These CRO contracts typically call for the payment of fees for services at the initiation of the contract and/or upon the achievement of certain clinical trial milestones. The Company prepays certain CRO fees whereby the prepayments are recorded as a current or non-current prepaid asset and are amortized into research and development expense over the period of time the contracted research and development services were performed. The Company's CRO contracts generally also include other fees such as project management and pass through fees whereby the Company expenses these costs as incurred, using the Company's best estimate. Pass through fees include, but are not limited to, regulatory expenses, investigator fees, travel costs, and other miscellaneous costs. Pass through fees incurred are based on the amount of work completed for the clinical trials and are monitored through reporting provided by the Company's CROs.

Stock-based compensation

The Company measures and recognizes compensation expense for all stock options and restricted stock units (RSUs) awarded to employees and non-employees and shares issued under the employee stock purchase plan based on the estimated fair value of the awards on the respective grant dates. The Company uses the Black-Scholes option pricing model to value its time-based and performance-based stock options and shares issued under the employee stock purchase plan. The Company uses a Monte Carlo simulation to value its market-based stock options. RSUs are valued at the fair market value per share of the Company's common stock on the date of grant. The Company recognizes compensation expense for time-based awards on a straight-line basis over the requisite service period, which is generally the vesting period of the award. The Company recognizes compensation expense for performance-based awards when the performance condition is probable of achievement. The Company recognizes compensation expense for market-based awards over the derived service period, estimated at the time of the grant. The Company recognizes expense for The Company accounts for forfeitures of stock option awards as they occur.

Estimating the fair value of options and shares issued under the employee stock purchase plan requires the input of subjective assumptions, including the estimated fair value of the Company's common stock, the expected life of the options, stock price volatility, the risk-free interest rate and expected dividends. The assumptions used in the Company's Black-Scholes option-pricing model and Monte Carlo simulation represent management's best estimates and involve a number of variables, uncertainties and assumptions and the application of management's judgment, as they are inherently subjective.

Income taxes

Income taxes are accounted for under the asset and liability method. The Company recognizes deferred tax assets and liabilities for temporary differences between the financial reporting basis and the tax basis of the Company's assets and liabilities and the expected benefits of net operating loss carryforwards. The impact of changes in tax rates and laws on deferred taxes, if any, applied during the period in which temporary differences are expected to be settled, is reflected in the Company's financial statements in the period of enactment. The measurement of deferred tax assets is reduced, if necessary, if, based on the weight of the evidence, it is more likely than not that some, or

(in thousands, except share and per share data)

all, of the deferred tax assets will not be realized. As of December 31, 2022 and 2021, the Company concluded that a full valuation allowance was necessary for all of its net deferred tax assets. The Company had no amounts recorded for uncertain tax positions, interest or penalties in the accompanying consolidated financial statements.

Net income (loss) per common share

Basic net income (loss) per common share is determined by dividing net income (loss) applicable to common stockholders by the weighted average common shares outstanding during the period. For the years ended December 31, 2022 and 2021, outstanding common stock options and common stock warrants have been excluded from the calculation of diluted net loss per share because their effect would be anti-dilutive. Therefore, the weighted average shares used to calculate both basic and diluted net loss per share are the same.

Diluted net loss per common share for the periods presented does not reflect the following potential common shares, as the effect would be antidilutive:

	Year Ended December 31,	
	2022	2021
Stock options	9,364,070	7,958,781
Restricted stock units	1,477,660	1,959,358
Common stock warrants	32,768,000	2,500,000
Total	43,609,730	12,418,139

Recent accounting pronouncements

In March 2022, the FASB issued ASU No. 2022-02, Financial Instruments - Credit Losses (Topic 326): Troubled Debt Restructurings and Vintage Disclosures. Since the issuance of ASU No. 2016-13, Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments, the Board has provided resources to monitor and assist stakeholders with the implementation of Topic 326. Post-Implementation Review (PIR) activities have included forming a Credit Losses Transition Resource Group, conducting outreach with stakeholders of all types, developing educational materials and staff question-and-answer guidance, conducting educational workshops, and performing an archival review of financial reports. ASU No. 2022-02 is intended to respond to feedback received during the PIR process. The new standard is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2022, with early adoption permitted. The Company does not expect ASU No. 2022-02 to have a significant impact on its results of operations, financial position and cash flows and related disclosures.

4. Fair Value Measurements

Assets and Liabilities Measured at Fair Value on a Recurring Basis

The Company applies the guidance in ASC 820, *Fair Value Measurements*, to account for financial assets and liabilities measured on a recurring basis. Fair value is measured as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. As such, fair value is a market-based measurement that is determined based on assumptions that market participants would use in pricing an asset or liability.

The Company uses a fair value hierarchy, which distinguishes between assumptions based on market data (observable inputs) and an entity's own assumptions (unobservable inputs). The guidance requires that fair value measurements be classified and disclosed in one of the following 3 categories:

Level I: Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities;

Level 2: Quoted prices in markets that are not active or inputs which are observable, either directly or indirectly, for substantially the full te1m of the asset or liability; and

Level 3: Prices or valuation techniques that require inputs that are both significant to the fair value measurement and unobservable (i.e., supported by little or no market activity).

Determining which category an asset or liability falls within the hierarchy requires significant judgment. The Company evaluates its hierarchy disclosures each reporting period. There were no transfers between Level I, 2 and 3 during the years ended December 31, 2022 and December 31, 2021.

The table below presents the liabilities (in thousands) measured and recorded in the financial statements at fair value on a recurring basis at December 31, 2022 categorized by the level of inputs used in the valuation of each liability.

	December 31, 2022			
	Total	Level 1	Level 2	Level 3
Liabilities				
Warrant Liability	$ 21,490	$ —	$ —	$ 21,490
Total Liabilities	$ 21,490	$ —	$ —	$ 21,490

As of December 31, 2021, the Company had no assets or liabilities measured and recorded at fair value on a recurring basis.

Changes in Level 3 Liabilities Measured at Fair Value on a Recurring Basis

Warrant Liability

The reconciliation of the Company's warrant liability measured at fair value on a recurring basis using unobservable inputs (Level 3) is as follows (in thousands):

	Warrant Liability
Balance, December 31, 2021	$ —
Warrants issued	20,279
Change in fair value of liability	1,211
Balance, December 31, 2022	$ 21,490

Assumptions Used in Determining Fair Value of Liability-Classified Warrants

The Company utilizes a Monte Carlo simulation valuation model which incorporates assumptions as to the stock price volatility, the expected life of the warrants, a risk-free interest rate, as well as timing and probability of equity financing. The Company values the Warrant Liability at each reporting period, with changes in fair value recognized in the consolidated statements of operations. The estimated fair value of the warrant liability is determined using Level 3 inputs. The inputs and values were as follows:

(in thousands, except share and per share data)

	November 23, 2022	December 31, 2022
Stock price	$ 1.77	$ 1.85
Strike price	$ 2.57	$ 2.57
Expected volatility	45.0 %	45.0 %
Risk-free interest rate	3.8 %	3.8 %
Expected dividend yield	— %	— %
Expected life (years)	5.00	4.90
Fair value per warrant	$ 0.67	$ 0.71

5. Inventory

Inventory consisted of the following:

	December 31,	
	2022	2021
Raw materials	$ 1,691	$ 3,504
Work-in-process	5,010	4,816
Finished goods	2,742	3,527
Total inventory	$ 9,443	$ 11,847

Inventories are stated at the lower of cost or net realizable value, as determined on a first-in, first-out basis.

6. Property and Equipment

Property and equipment, net, consisted of:

	December 31,	
	2022	2021
Computer equipment and software	$ 1,203	$ 1,173
Furniture and fixtures	366	366
Machinery and equipment	3,067	3,367
Leasehold improvements	609	609
Construction in process	115	115
	5,360	5,630
Less: accumulated depreciation	(4,565)	(4,283)
	$ 795	$ 1,347

Depreciation expense was $530 and $645 for the years ended December 31, 2022 and 2021, respectively. In addition, depreciation expense of $665 was charged to inventory and no depreciation was charged to prepaid expenses and other assets as of December 31, 2022, which represents depreciation expense related to equipment involved in the manufacturing process.

7. Leases

The Company leases office space, storage space and equipment (primarily vehicles). The Company evaluates renewal options at lease inception on an ongoing basis and includes renewal options that it is reasonably certain to exercise in its expected lease terms when classifying leases and measuring lease liabilities. Lease agreements generally do not require material variable lease payments, residual value guarantees or restrictive covenants.

(in thousands, except share and per share data)

The table below presents the operating lease assets and liabilities recognized on the Company's consolidated balance sheets:

	Balance Sheet Line Item	December 31, 2022	December 31, 2021
Non-current operating lease assets	Other assets	$ 2,445	$ 4,051
Operating lease liabilities:			
Current operating lease liabilities	Accrued expenses and other current liabilities	1,971	2,094
Non-current operating lease liabilities	Other liabilities	625	2,190
Total operating lease liabilities		$ 2,596	$ 4,284

The depreciable lives of operating lease asset leasehold improvements are limited by the lease term.

The Company's leases generally do not provide an implicit rate, and therefore, the Company uses its incremental borrowing rate as the discount rate when measuring operating leases liabilities. The incremental borrowing rate represents an estimate of the interest rate the Company would incur at lease commencement to borrow an amount equal to the lease payments on a collateralized basis over the term of a lease. The Company used the incremental borrowing rates as of January 1, 2019 for operating leases that commenced prior to that date.

The Company's weighted average remaining lease term and weighted average discount rate for operating leases as of December 31, 2022 are:

	December 31, 2022
Weighted average remaining lease term (years)	2.04
Weighted average discount rate	5.24 %

The table below reconciles the undiscounted future minimum lease payments (displayed in aggregate by year) under non-cancelable operating leases with terms of more than one year to the total operating lease liabilities recognized on the consolidated balance sheets as of December 31, 2022:

	December 31, 2022
2023	2,153
2024	548
2025	82
Thereafter	—
Total undiscounted future minimum lease payments	2,783
Less: difference between undiscounted lease payments and discounted operating lease liabilities	187
Total operating lease liabilities	$ 2,596

No operating lease payments include options to extend lease terms that are reasonably certain of being exercised for the year ended December 31, 2022.

Operating lease costs were $2,985 and $2,843 for the years ended December 31, 2022 and 2021, respectively. Operating lease costs are included within selling, general and administrative expenses on the consolidated statements of operations.

Cash paid for amounts included in the measurement of operating lease liabilities were $2,570 and $2,466 for the years ended December 31, 2022 and 2021, respectively. This amount is included in operating activities in the consolidated statements of cash flows.

(in thousands, except share and per share data)

8. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consisted of:

	December 31,	
	2022	2021
Accrued expenses:		
Product revenue allowances	27,993	26,521
Selling, general and administrative expenses	3,799	6,124
Research and development expenses	1,298	6,857
Payroll expenses	7,888	7,569
Other	1,915	2,057
Total accrued expenses	42,893	49,128
Other current liabilities:		
Lease liability	$ 1,971	$ 2,094
Total other current liabilities	1,971	2,094
Total accrued expenses and other current liabilities	$ 44,864	$ 51,222

9. License Agreements

Currax License Agreement

On September 25, 2019, OptiNose AS entered into a license agreement (the Currax License Agreement) with Currax pursuant to which the Company granted Currax an exclusive license to certain intellectual property for the commercialization of Onzetra Xsail in the US, Canada and Mexico.

In January 2021, a specified regulatory milestone was met and the Company received a $1,000 milestone payment. The Company does not expect to receive any further payments from Currax under the terms of the License Agreement other than reimbursement for certain expenses.

10. Debt, net

On September 12, 2019 (the Closing Date), the Company entered into a Note Purchase Agreement with funds managed by Pharmakon Advisors, LP (Pharmakon), the investment manager of BioPharma Credit Funds (BioPharma). The Note Purchase Agreement provided the Company with $130,000 in debt financing, of which $80,000 of senior secured notes (the Pharmakon Senior Secured Notes) was issued on the Closing Date, $30,000 was issued on February 13, 2020 after achieving the $9,000 consolidated XHANCE net sales and royalties threshold for the quarter ended December 31, 2019 and $20,000 was issued on December 1, 2020 after achieving the $14,500 consolidated XHANCE net sales and royalties threshold for the quarter ended September 30, 2020.

On August 10, 2022, the Company entered into a Third Amendment to the Note Purchase Agreement (the Third Amendment). The Third Amendment reduced the minimum consolidated XHANCE net sales and royalties required to be achieved under the Note Purchase Agreement for the trailing twelve-month period ending December 31, 2022 from $90,000 to $85,000 in exchange for a $780 fee due on the repayment of the Pharmakon Senior Secured Notes.

On November 9, 2022, the Company entered into a Fourth Amendment to the Note Purchase Agreement (the Fourth Amendment). The Fourth Amendment resulted in the waiver of the minimum consolidated XHANCE net sales and royalties required to be achieved under the Note Purchase Agreement for the trailing twelve-month period ending September 30, 2022 and December 31, 2022 in exchange for a $1,300 fee due upon repayment of the Pharmakon Senior Secured Notes.

On November 23, 2022, the Company amended and restated the Note Purchase Agreement, initially entered into on September 12, 2019 and amended through November 9, 2022, among the Company, its subsidiaries, OptiNose US, Inc., OptiNose AS and OptiNose UK, Ltd. and BioPharma Credit PLC, as collateral agent, and the purchasers party thereto from time to time (the A&R Note Purchase Agreement). Pursuant to the A&R Note Purchase Agreement, certain modifications to the affirmative and negative covenants, events of default and other provisions were made, including, without limitation, (i) the requirement for the Company to deliver quarterly and annual financial statements that, commencing with the Company's consolidated financial statements for the year ending December 31, 2023, are not subject to a "going concern" statement (the Going Concern Covenant) and (ii) the removal of certain exceptions to the negative covenants which previously permitted the Company to enter into certain transactions without the consent of the holders of the Pharmakon Senior Secured Notes, including permitted acquisitions, swap contracts, convertible bonds and revolving credit facilities. The financial covenants requiring the Company to achieve minimum trailing twelve-month consolidated XHANCE net product sales and royalties were also modified as follows (in thousands):

Trailing Twelve-Months Ending	Requirement Prior to A&R Note Purchase Agreement	Requirement under the A&R Note Purchase Agreement
September 30, 2022	N/A	N/A
December 31, 2022	N/A	N/A
March 31, 2023	$98,750	N/A
June 30, 2023	102,500	N/A
September 30, 2023	106,250	N/A
December 31, 2023	110,000	N/A
March 31, 2024	113,750	$82,500
June 30, 2024	117,500	90,000
September 30, 2024	N/A	102,500
December 31, 2024	N/A	110,000
March 31, 2025	N/A	115,000
June 30, 2025	N/A	120,000
September 30, 2025	N/A	125,000
December 31, 2025	N/A	130,000
March 31, 2026	N/A	135,000
June 30, 2026	N/A	140,000
September 30, 2026	N/A	145,000
December 31, 2026	N/A	150,000
March 31, 2027	N/A	155,000
June 30, 2027	N/A	160,000
September 30, 2027	N/A	165,000

The A&R Note Purchase Agreement provided for an extension of the maturity date of the Pharmakon Senior Secured Notes from September 12, 2024 to June 30, 2027 (New Maturity Date), an extension of the interest-only period from September 2023 to September 2025, after which principal repayments will commence starting on September 30, 2025 and will be made in eight equal quarterly installments of principal and interest through the New Maturity Date. As part of the A&R Note Purchase Agreement the Pharmakon Senior Secured Notes will now bear an amended interest rate through the New Maturity Date equal to the 3-month Secured Overnight Financing Rate (subject to a 2.50% floor), determined as of the date that is two business days prior to the commencement of each quarter, plus 8.50% per annum (effective rate of 13.62% at December 31, 2022), which interest rate shall be increased by an additional 3.00% per annum upon the occurrence and during the continuation of any event of default.

In conjunction with the A&R Note Purchase Agreement, a modification was made to the "make-whole" premium payment due in connection with any principal prepayments (whether mandatory or voluntary) made prior to the 3-year anniversary of the date of the A&R Note Purchase Agreement. On any such prepayment date, the Company will be required to pay a make-whole premium in the amount of (i) for any prepayment date occurring up until and including the 18-month anniversary of the date of the A&R Note Purchase Agreement, the foregone interest from such prepayment date through the 18-month anniversary of such prepayment date; and (ii) for any prepayment after the 18-month anniversary of the date of the A&R Note Purchase Agreement, the foregone interest from such prepayment date through the 3-year anniversary of the date of the A&R Note Purchase Agreement; provided, however, that in no event shall the amount of all make-whole premium payments exceed $24,000 in the aggregate;

As an inducement for the holders of the Pharmakon Senior Secured Notes to enter into the A&R Note Purchase Agreement, the Company is required to pay the holders of the Pharmakon Senior Secured Notes an amendment fee of $3,900 (representing 3.00% of the outstanding principal balance of such notes) due on the New Maturity Date or the earlier repayment of the Pharmakon Senior Secured Notes, which amendment fee shall be (i) reduced to $1,300 in the event that the Company repays the Pharmakon Senior Secured Notes in full prior to the one-year anniversary of the date of the A&R Note Purchase Agreement and (ii) reduced to $2,600 in the event that the Company repays the Pharmakon Senior Secured Notes in full on or after the one-year anniversary of the date of the A&R Note Purchase Agreement and prior to second anniversary of the date of the A&R Note Purchase Agreement. Additionally, the $1,300 fee payable under the Fourth Amendment to the Note Purchase Agreement that the Company entered into on November 9, 2022 will be credited against the amendment fee payable in connection with the A&R Note Purchase Agreement.

The Pharmakon Senior Secured Notes are secured by a pledge of substantially all of the assets of the Company and the Guarantors and the A&R Note Purchase Agreement contains affirmative and negative covenants customary for financings of this type, including limitations on the Company's and its subsidiaries' ability, among other things, to incur additional debt, grant or permit additional liens, make investments and acquisitions, merge or consolidate with others, dispose of assets, pay dividends and distributions, repay junior indebtedness, incur a material adverse change and enter into affiliate transactions, in each case, subject to certain exceptions. In addition, the A&R Note Purchase Agreement contains financial covenants requiring the Company to maintain certain minimum trailing twelve-month consolidated XHANCE net sales and royalties, tested on a quarterly basis as noted in the table above, and to have at least $30,000 of cash and cash equivalents at all times. The A&R Note Purchase Agreement also includes events of default customary for financings of this type, in certain cases subject to customary periods to cure, following which BioPharma may accelerate all amounts outstanding under the Pharmakon Senior Secured Notes.

The Company believes that it is probable that it will not achieve the trailing twelve-month minimum consolidated XHANCE net sales and royalties thresholds that it is required to achieve commencing with the period ending March 31, 2024. Additionally, without additional capital, the Company believes that it is probable that it will not be able to maintain at least $30,000 of cash and cash equivalents for at least twelve-months following the filing of this Form 10-K. In addition, the Company believes that it is unlikely that it will be able to maintain compliance with the Going Concern Covenant in 2024. As a result, in accordance with FASB Accounting Standards Codification 470, the Company has classified all outstanding principal and the payment of additional fees upon maturity as a current liability in the accompanying consolidated balance sheet as of December 31, 2022.

The Company recorded interest expense of $16,843 and $15,973 during the years ended December 31, 2022 and 2021, respectively. Interest expense included total coupon interest and the amortization of debt issuance costs.

(in thousands, except share and per share data)

The debt balance is comprised of the following:

	December 31,	
	2022	2021
Face amount	$ 130,000	$ 130,000
Front end fees	(666)	(717)
Debt issuance costs	(6,739)	(4,165)
Back end fees	5,980	1,300
Debt, net	$ 128,575	$ 126,418

11. Employee Benefit Plans

The Company maintains a defined contribution 401(k) retirement plan, which covers all eligible US employees. Employees are eligible to participate in the plan on the first of the month following their date of hire. Under the 401(k) retirement plan, participating employees may defer up to 100% of their pre-tax salary, but not more than statutory limits. The Company matches 100% of the first 3% of participating employee contributions and 50% of the next 2% of participating employee contributions, subject to applicable IRC limits. The Company incurred costs of $1,112 and $1,340 related to the Company match applicable to employee contributions for the years ended December 31, 2022 and 2021, respectively. The Company's contributions are made in cash. The Company's common stock is not currently an investment option available to participants in the 401(k) retirement plan. As of December 31, 2022, approximately $256 was recorded in accrued expenses related to the Company match.

For former Norway employees, the Company maintained a defined contribution pension plan which met the statutory requirements. The Company incurred costs of $11 and $6 related to the pension plans for the years ended December 31, 2022 and 2021, respectively.

12. Commitments and Contingencies

Purchase commitments

As of December 31, 2022, the Company had no material outstanding non-cancellable purchase commitments related to inventory and other goods and services, including pre-commercial manufacturing scale-up and sales and marketing activities.

Employment agreements

The Company has entered into employment contracts with its officers and certain employees that provide for severance and continuation of benefits in the event of termination of employment by the Company without cause or by the employee for good reason. In addition, in the event of termination of employment following a change in control, the vesting of certain equity awards may be accelerated.

Litigation

Liabilities for loss contingencies arising from claims, assessments, litigation, fines, penalties, and other sources are recorded when it is probable that a liability has been incurred and the amount can be reasonably estimated. The Company is not currently a party to any material pending legal proceedings.

(in thousands, except share and per share data)

13. Stockholders' Equity

Common stock

On November 18, 2021, the Company closed an underwritten public offering (the 2021 Offering) of 28,750,000 shares of Company common stock (Common Stock) at a price of $1.60 per share. As a result of the Offering, the Company received $42,842 in net proceeds, after deducting commissions and expenses of $2,860 and offering costs payable by the Company of $298.

On November 23, 2022, the Company closed an underwritten public offering (the 2022 Offering) of 26,320,000 shares of Common Stock at a price of $1.89 per share and accompanying warrants to purchase 26,320,000 shares of Common Stock at a public offering price of $0.01 per warrant. In addition, the Company granted the underwriters an option for a period of 30 days to purchase up to an additional 3,948,000 shares of Common Stock (the Option Shares) and/or warrants to purchase 3,948,000 shares of Common Stock (The Option Warrants). The underwriters exercised their option to purchase the Option Warrants on November 22, 2022. In December 2022, the Underwriter partially exercised the option to purchase an additional 1,541,299 of the Option Shares. As a result of the 2022 Offering and the exercise of the options, the Company received $49,296 in net proceeds, after deducting commissions of $3,238 and offering costs payable by the Company of $359.

Each share of common stock entitles the holder to one vote on all matters submitted to a vote of the Company's stockholders. Subject to preferences that may apply to any outstanding preferred stock, holders of common stock are entitled to receive ratably any dividends that the Company's board of directors may declare out of funds legally available for that purpose on a non-cumulative basis. No dividends had been declared through December 31, 2022.

Common stock warrants

On November 18, 2021, in conjunction with the Second Amendment to the original Note Purchase Agreement (Second Amendment), the Company issued warrants to purchase an aggregate of 2,500,000 shares of Common Stock at a per share exercise price of $1.60 and fair value of $2,009. Upon execution of the Second Amendment, previously issued warrants to purchase 810,357 shares of Common Stock at a per share exercise price of $6.72 which were set to expire on September 12, 2022, were cancelled.

The grant date fair value of the 2,500,000 warrants issued in connection with the Pharmakon Senior Secured Notes was estimated at the time of grant using the Black-Scholes option-pricing model using the following weighted average assumptions:

Risk free interest rate		0.87 %
Expected term (in years)		3
Expected volatility		78.25 %
Annual dividend yield		0.00 %
Fair value of common stock	$	1.60

As part of the 2022 Offering, the Company issued warrants to purchase 30,268,000 shares of Common Stock at a public offering price of $0.01 per warrant (the Warrants). Each Warrant has an exercise price of $2.565 per share of Common Stock and is exercisable until the expiration date, which is the fifth anniversary of the date of issuance (November 23, 2027). After such date, any unexercised Warrants will expire and have no further value. If the Company issues or sells, or is deemed pursuant to the terms of the Warrants to have issued or sold, any shares of Common Stock (which includes, among other things, options and securities convertible into shares of Common Stock), excluding certain issuances defined in the Warrants as "excluded issuances, for a price per share less than the exercise price of the Warrants in effect immediately prior to such issuance or sale or deemed issuance or sale (such event, a dilutive issuance), then immediately after such dilutive issuance the exercise price then in effect of the Warrants shall be reduced to the price of the shares of Common Stock issued or sold or deemed to be issued or sold in the dilutive issuance in the manner set forth in the Warrant.

(in thousands, except share and per share data)

A holder of Warrants will not have the right to exercise any portion of a Warrant if the holder (together with its affiliates) would beneficially own in excess of 4.99% (or on election of such holder, prior to the issuance of any Warrants, 9.99%) of the number of shares of Common Stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the Warrants; provided, however, such holder may increase or decrease such percentage to any other percentage not in excess of 19.99%, provided that any increase in such percentage shall not be effective until 61 days after such notice is delivered to the Company.

Pursuant to the terms of the Warrant, the Company could be required to settle the Warrants in cash in the event of a "fundamental transaction" as defined in the Warrant (which includes, among other things, an acquisition of the Company) and, as a result, the Warrants are required to be measured at fair value and reported as liability in the consolidated balance sheet. The Company recorded the fair value of the Warrants upon issuance using a Monte Carlo simulation and are required to revalue the Warrants at each reporting date with any changes in fair value recorded on our statement of operations.

As of December 31, 2022, the Company had the following warrants outstanding to purchase shares of Common Stock:

Number of Shares	Classification	Exercise Price Per Share	Expiration Date
2,500,000	Equity	$1.60	November 15, 2024
30,268,000	Liability	$2.565	November 23, 2027

14. Stock-based Compensation

The Company issues stock-based awards pursuant to its 2010 Stock Incentive Plan. Effective as of October 12, 2017, the Company's 2010 Stock Incentive Plan was amended and restated (A&R Plan). The A&R Plan provides for the grant of incentive stock options, non-statutory stock options, restricted stock awards, restricted stock units, deferred stock units, performance shares, stock appreciation rights and other equity-based awards. The Company's employees, officers, directors and other persons are eligible to receive awards under the A&R Plan. As of December 31, 2022, 17,299,284 shares of the Company's common stock were authorized to be issued under the A&R Plan, and 3,607,066 shares were reserved for future awards under the A&R Plan. The number of shares of the Company's common stock authorized under the A&R Plan will automatically increase on January 1st of each year until the expiration of the A&R Plan, in an amount equal to four percent of the total number of shares of the Company's common stock outstanding on December 31st of the preceding calendar year, subject to the discretion of the Company's board of directors or compensation committee to determine a lesser number of shares shall be added for such year.

The amount, terms of grants, and exercisability provisions are determined and set by the Company's board of directors or compensation committee. The Company measures stock-based awards at grant-date fair value and records compensation expense on a straight-line basis over the vesting period of the award.

Stock options

The Company has issued service-based, performance-based and market-based stock options that generally have a contractual life of up to 10 years and may be exercisable in cash or as otherwise determined by the board of directors. Vesting generally occurs over a period of not greater than four years. Performance-based options may vest upon the achievement of certain milestones in connection with the Company's development programs. As of December 31, 2022, all of the performance conditions related to performance-based stock options issued by the Company have been achieved. Market-based options may vest upon the achievement of certain market-based objectives relating to the trading price of the Company's Common Stock.

(in thousands, except share and per share data)

The following table summarizes the activity related to stock option grants to employees and non-employees for the year ended December 31, 2022:

	Shares	Weighted average exercise price per share	Weighted average remaining contractual life
Outstanding at December 31, 2021	7,958,781	$ 8.87	6.50
Granted	3,473,370	1.88	
Exercised	(95,000)	2.18	
Expired	(947,999)	9.56	
Forfeited	(1,025,082)	3.35	
Outstanding at December 31, 2022	9,364,070	$ 6.88	6.05
Exercisable at December 31, 2022	5,521,738	$ 9.98	4.55

During the year ended December 31, 2022, stock options to purchase 3,473,370 shares of common stock were granted to employees that generally vest over four years. Included in the total stock options granted were market-based options to purchase 959,215 shares of Common Stock. The stock options, including the market-based options, had an estimated weighted average grant date fair value of $1.21. The grant date fair value of each service-based and performance-based option grant was estimated at the time of grant using the Black-Scholes option-pricing model. The grant date fair value of each market-based stock option grant was estimated at the time of grant using a Monte Carlo simulation.

The total aggregate intrinsic value of stock options, other than market-based stock options, exercised during the years ended December 31, 2022 and 2021 was $111 and $35, respectively. The aggregate intrinsic value of stock options outstanding and stock options exercisable, other than market-based stock options, as of December 31, 2022 was $81 and $8, respectively. At December 31, 2022, the unrecognized compensation cost related to unvested stock options, other than market-based stock options, expected to vest was $4,368. This unrecognized compensation will be recognized over an estimated weighted-average amortization period of 2.35 years.

During the year ended December 31, 2022, market-based options to purchase 959,215 shares of Common Stock were granted to employees and generally become eligible to vest over four years, subject to the achievement of certain market-based objectives relating to the trading price of the Common Stock. Stock based compensation for these awards is recognized over the derived service period of approximately 2 years. The grant date fair value of each stock option grant, as well as the derived service period for these awards, was estimated at the time of grant using a Monte Carlo simulation. During the year ended December 31, 2022, 297,677 market-based options vested upon the achievement of certain market-based objectives relating to the trading price of the Company's Common Stock.

Included in the table above are 753,500 options granted outside the A&R Plan. The grants were made pursuant to the Nasdaq inducement grant exception in accordance with Nasdaq Listing Rule 5635(c)(4).

(in thousands, except share and per share data)

Restricted stock units

The Company has issued service-based and performance-based restricted stock units (RSUs). Vesting generally occurs over a period not greater than four years. Vesting of the performance-based RSUs is subject to the achievement of certain milestones in connection with the Company's development programs.

The following table summarizes the activity related to RSUs granted to employees for the year ended December 31, 2022:

	Shares
Balance at December 31, 2021	1,959,358
Granted	1,105,246
Vested and settled	(949,857)
Expired/forfeited/canceled	(637,087)
Balance at December 31, 2022	1,477,660
Expected to vest at December 31, 2022	1,477,660

During the year ended December 31, 2022, the Company granted 1,105,246 RSUs at a weighted-average grant date fair value of $1.85, all of which were service-based RSUs. No performance-based RSUs were granted in 2022. As of December 31, 2022, the milestone associated with the previously granted performance based-RSUs was achieved. As a result 248,827 RSUs vested on June 15, 2022. At December 31, 2022, the recognized compensation cost related to vested performance-based RSUs was $1,669. At December 31, 2022, the unrecognized compensation cost related to unvested service-based RSUs expected to vest was $3,123, to be recognized over an estimated weighted-average amortization period of 2.24 years. The unrecognized compensation cost related to unvested performance-based RSUs was $942, which will be recognized over the remaining service period.

Included in the table above are 60,000 RSUs granted outside the A&R Plan. The grants were made pursuant to the Nasdaq inducement grant exception in accordance with Nasdaq Listing Rule 5635(c)(4).

2017 Employee Stock Purchase Plan

The Company's 2017 Employee Stock Purchase Plan (the 2017 Plan) became effective on October 12, 2017. As of December 31, 2022, 2,021,813 shares of the Company's common stock were authorized to be issued pursuant to purchase rights granted to its employees or to employees of any of its participating affiliates under the 2017 Plan. 982,989 shares of the Company's common stock were reserved for future issuance under the 2017 Plan. The number of shares of the Company's common stock that may be issued pursuant to rights granted under the 2017 Plan shall automatically increase on January 1st of each year until the expiration of the 2017 Plan, in an amount equal to one percent of the total number of shares of the Company's common stock outstanding on December 31st of the preceding calendar year, subject to the discretion of the board of directors or compensation committee to determine a lesser number of shares shall be added for such year.

Under the 2017 Plan, eligible employees can purchase the Company’s common stock through accumulated payroll deductions at such times as are established by the administrator. The 2017 Plan is administered by the compensation committee. Eligible employees may contribute up to 15% of their eligible compensation. A participant may not accrue rights to purchase more than $25 worth of the Company’s common stock for each calendar year in which such right is outstanding.

Payroll withholdings accumulate during the following six month offering periods each calendar year while the Purchase Plan is effective:

- January 1 through June 30, and
- July 1 through December 31.

(in thousands, except share and per share data)

At the end of each offering period, shares of the Company's common stock may be purchased at 85% of the lesser of the average of the high and low sales price of the Company's common stock on (i) the first trading day of the relevant offering period and (ii) the last trading day of the relevant offering period (or, if the relevant offering period has multiple purchase periods, the last trading day of the relevant purchase period). In accordance with the guidance in ASC 718-50 – *Compensation – Stock Compensation*, the ability to purchase shares of the Company's common stock at the lower of the price on the first day of the offering period or the last day of the offering period (i.e. the purchase date) represents an option and, therefore, the 2017 Plan is a compensatory plan under this guidance. Accordingly, stock-based compensation expense is determined based on the option's grant-date fair value as estimated by applying the Black-Scholes option-pricing model and is recognized over the requisite service period of the option. The Company has recognized stock-based compensation expense of $253 and $402 during the years ended December 31, 2022 and 2021, respectively, related to the 2017 Plan.

Stock-based compensation expense

The Company recorded stock-based compensation expense in the following expense categories of its accompanying consolidated statements of operations for the years ended December 31, 2022 and 2021:

	Year Ended December 31,	
	2022	2021
Cost of product sales	$ 35	$ 50
Research and development	809	1,079
Selling, general and administrative	8,033	8,874
Total stock-based compensation expense	$ 8,877	$ 10,003

In addition, stock-based compensation expense of $83 was charged to inventory as of December 31, 2022. No stock-based compensation expense was charged to prepaid expenses and other assets as of December 31, 2022. These charges represent the total stock-based compensation expense incurred related to employees involved in the manufacturing process of finished goods and samples during the period.

The Company utilized the Black-Scholes valuation model for estimating the fair value of stock options issued under the 2017 Plan. The Company calculated the fair value of each option grant and the shares issued under the 2017 Plan on the respective dates of grant using the following weighted average assumptions:

	December 31, 2022	
	2010 A&R Stock Incentive Plan	2017 Employee Stock Purchase Plan
Risk free interest rate	2.22 %	0.17 %
Expected term (in years)	6.08	0.50
Expected volatility	73.23 %	88.13 %
Annual dividend yield	0.00 %	0.00 %

Option valuation methods, including Black-Scholes, require the input of subjective assumptions, which are discussed below.

- The expected term of employee options is determined using the "simplified" method, as prescribed in SEC's Staff Accounting Bulletin (SAB) No. 107, *Share Based Payment* (SAB No. 107), whereby the expected life equals the arithmetic average of the vesting term and the original contractual term of the option due to the Company's lack of sufficient historical data. The expected term of non-employee options is equal to the contractual term.
- The expected volatility is based on a weighted average of the Company's historical volatility and the volatilities of similar entities within the Company's industry which were commensurate with the expected term assumption as described in SAB No. 107.
- The risk-free interest rate is based on the interest rate payable on US Treasury securities in effect at the time of grant for a period that is commensurate with the assumed expected term.

(in thousands, except share and per share data)

- The expected dividend yield is 0% because the Company has not historically paid, and does not expect for the foreseeable future to pay, a dividend on its common stock.

15. Income Taxes

Income taxes are based on the following book income (loss) before income tax expense:

	Year Ended December 31,	
	2022	2021
Domestic operations	$ (72,750)	$ (78,801)
Foreign operations	(2,083)	(3,495)
Loss before provision for income taxes	$ (74,833)	$ (82,296)

A reconciliation of income tax expense (benefit) at the US federal statutory income tax rate and the income tax provision in the financial statements is as follows:

	Year Ended December 31,	
	2022	2021
Income tax expense at statutory rate	21.0 %	21.0 %
Permanent items	(1.5)	(0.4)
Foreign rate differential	(0.7)	0.1
Impact of foreign operations	(14.5)	—
State taxes, net of federal benefit	2.6	4.7
Tax rate changes	(2.9)	—
Foreign exchange and other	(1.7)	(0.9)
Stock based compensation	(2.9)	—
Prepaid royalty write off	(11.8)	—
Change in valuation allowance	12.4	(24.5)
Effective income tax rate	0.0 %	0.0 %

(in thousands, except share and per share data)

The principal components of the Company's deferred tax assets and liabilities are as follows:

	Year Ended December 31,	
	2022	2021
Deferred tax assets:		
Accrued expenses and other	$ 5,144	$ 6,712
Prepaid licensing arrangement	—	9,441
Interest expense	14,304	10,708
Stock compensation	7,193	8,583
Lease liability	642	1,081
Research and development credits	2,460	2,461
Capitalized R&D	3,377	
Net operating losses	83,376	87,324
Total deferred tax assets	116,496	126,310
Deferred tax liabilities:		
Fixed assets, including leases	(171)	(210)
Right-to-use asset	(605)	(1,024)
Total deferred tax liabilities:	(776)	(1,234)
Less: Valuation allowance	(115,720)	(125,076)
Total net deferred tax assets (liabilities)	$ —	$ —

As of December 31, 2022, the Company had foreign net operating loss (NOL) carry forwards of $9,073, primarily from its operations in Norway. As of December 31, 2022, the Company had federal and state NOLs of $335,009 and $252,324, respectively. These domestic NOL carry forwards may be subject to an annual limitation in the event of cumulative changes in the ownership interests of significant stockholders over a three-year period in excess of 50%. This could limit the amount of NOLs that the Company can utilize annually to offset future domestic taxable income, if any. The amount of the annual limitation, if any, will be determined based on the value of the Company immediately prior to the ownership change. Subsequent ownership changes may further affect the limitation in future years. The federal NOLs generated after 2017 have an indefinite carry forward period. The federal NOLs generated prior to 2018 will expire from 2030 through 2037. Some state NOLs will not expire while other state NOLs expire over various periods depending on the rules of the jurisdiction in which they were generated. The earliest state NOL expiration is in 2030.

The U.S. NOL and tax credit carry forwards could expire unused and be unavailable to offset future income tax liabilities because of their limited duration or because of other restrictions under U.S. tax law. Under Sections 382 and 383, if a corporation undergoes an "ownership change", generally defined as a greater than 50% change, by value, in equity ownership during a three-year period, the corporation's ability to offset pre-change tax attributes, such as NOLs and R&D tax credits, against post-change income or tax may be limited. We have not performed an analysis under Section 382 and cannot predict or otherwise determine whether utilization of our federal tax attribute carry forwards may be limited. As a result, if we have taxable income in the future, our ability to use existing U.S. NOL and R&D tax credit carry forwards to reduce U.S. taxable income or tax liability may be subject to limitation resulting in increased future tax liabilities. Similar rules at the state level may also limit our ability to use state NOLs. Also, there may be periods when the use of NOLs is suspended or otherwise limited at the state level, which could accelerate or permanently increase state taxes owed.

The company also has federal and state R&D credit carryforwards of $2,487 which can be carried forward for 20 years beginning to expire in 2031.

ASC 740 requires the establishment of a valuation allowance to reduce deferred tax assets if, based on the weight of the available positive and negative evidence it is more likely than not that all or a portion of the deferred tax assets will not be realized. There is insufficient positive evidence to overcome the negative evidence attributable to the Company's cumulative operating losses. Consequently, the Company established a full valuation allowance against its net deferred tax assets at December 31, 2022 and 2021, respectively, because the Company's management was unable to conclude that it is more likely than not that these assets will be fully realized. The Company had a net decrease in its valuation allowance of $9,356 during the year ended December 31, 2022, primarily related to material deferred tax asset write offs from prepaid royalty and equity compensation as well as Norway NOL utilization in the current year.

The Company files income tax returns in Norway, the UK, the US, and various states. The Company is subject to examination by federal, state and foreign jurisdictions. The Company's tax years in the US are open under statute from inception to present. All open years may be examined to the extent that tax credits or net operating loss carry forwards are used in future periods.

The Company's policy is to record interest and penalties related to uncertain tax positions in income tax expense. As of December 31, 2022, the Company had no accrued interest or penalties related to uncertain tax positions and no amounts have been recognized in the Company's statement of operations.

On March 27, 2020, the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) was enacted into law in response to the COVID-19 pandemic. The CARES Act contains income tax provisions, such an enhanced interest deductibility, repeal of the 80% limitation with respect to net operating losses arising in taxable years 2018-2020, and additional depreciation deductions related to qualified improvement property. The Company has concluded the analysis of these provisions as of year-end and the CARES Act did not have a material impact on the Company's income taxes for 2021.

On December 27, 2020, the Consolidated Appropriations Act, 2021 (CAA) was signed into law. Along with providing funding for normal government operations ($1.4 trillion), this bill provides for additional COVID-19 focused relief ($900 billion). The CAA extends certain provisions of the CARES Act, provides additional funding for others and contains new relief provisions. The CAA did not have a material impact on the Company's income taxes for 2021.

On August 16, 2022, the Inflation Reduction Act of 2022 was enacted into law containing corporate income tax provisions such as the corporate alternative minimum tax and an excise tax on the repurchase of corporate stock. These provisions are not expected to have a material impact on the Company's income taxes in the near term.

DESCRIPTION OF THE REGISTRANT'S SECURITIES REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

As of the date of the Annual Report on Form 10-K of which this exhibit forms a part, the only class of securities of OptiNose, Inc. ("we," "us" and "our") registered under Section 12 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), is our common stock, $0.001 par value per share.

COMMON STOCK

The following description of our common stock summarizes provisions of our fourth amended and restated certificate of incorporation, our amended and restated bylaws, and the Delaware General Corporation Law. For a complete description, refer to our fourth amended and restated certificate of incorporation and our amended and restated bylaws, which are incorporated by reference as exhibits to the Annual Report on Form 10-K of which this exhibit is a part, and to the applicable provisions of the Delaware General Corporation Law.

Our fourth amended and restated certificate of incorporation authorizes us to issue up to 205,000,000 shares, 200,000,000 of which is designated as common stock with a par value of $0.001 per share. The shares of common stock currently outstanding are fully paid and nonassessable.

Rights

Voting Rights. Each holder of our common stock is entitled to one vote for each share on all matters submitted to a vote of the stockholders, other than election of directors, which is determined by a plurality of the votes cast by the stockholders entitled to vote on the election of such director. In addition, the affirmative vote of the holders of at least 66$^{2}/_{3}$% of the voting power of all of the then outstanding voting stock is required to take certain actions, including amending certain provisions of our fourth amended and restated certificate of incorporation, such as the provisions relating to director liability, amending our bylaws or changing the Court of Chancery of the State of Delaware and United States District Court for the District of Delaware and any appellate courts thereof from being the sole and exclusive forums for certain actions brought by our stockholders against us or our directors, officers or employees.

Under our fourth amended and restated certificate of incorporation and amended and restated bylaws, our stockholders do not have cumulative voting rights. Because of this, the holders of a majority of the shares of common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they should so choose.

Dividends. Subject to the preferences that may be applicable to any outstanding preferred stock, holders of our common stock are entitled to receive ratably any dividends that may be declared by our board of directors out of funds legally available for that purpose.

Liquidation Rights. In the event of our liquidation, dissolution or winding up, holders of our common stock are entitled to share ratably in all assets remaining after payment of liabilities and the liquidation preference of any outstanding preferred stock.

No Preemptive or Similar Rights. Our common stock is not entitled to preemptive rights and is not subject to conversion, redemption or sinking fund provisions. The common stock is not subject to future calls or assessments by us. The rights, preferences and privileges of the 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 in the future.

Anti-Takeover Effects of Our Certificate of Incorporation and Bylaws and Delaware Law

Certificate of Incorporation and Bylaws. Provisions of our fourth amended and restated certificate of incorporation and our amended and restated bylaws may delay or discourage transactions involving an actual or potential change of control or change in our management, including transactions in which stockholders might otherwise receive a premium for their shares, or transactions that our stockholders might otherwise deem to be in their best interests. Therefore, these provisions could adversely affect the price of our common stock. Among other things, our fourth amended and restated certificate of incorporation and our amended and restated bylaws:

- permit our board of directors to issue up to 5,000,000 shares of preferred stock, with any rights, preferences and privileges as it may designate, which issuance could result in the loss of voting control by other stockholders;
- provide that our board of directors is classified into three classes with staggered, three-year terms and that directors may only be removed for cause by the affirmative vote of the holders of at least a majority of the voting power of outstanding shares of our capital stock;
- provide that all vacancies on our board of directors, including as a result of newly created directorships, may, except as otherwise required by law, be filled only by the affirmative vote of a majority of directors then in office, even if less than a quorum;
- require that any action to be taken by our stockholders must be effected at a duly called annual or special meeting of stockholders and not be taken by written consent;
- provide that stockholders seeking to present proposals before a meeting of stockholders or to nominate candidates for election as directors at a meeting of stockholders must provide advance notice in writing, and also specify requirements as to the form and content of a stockholder's notice;
- require that the amendment of certain provisions of our certificate of incorporation relating to several anti-takeover measures and other provisions may only be approved by a vote of 66-2/3% of our outstanding common stock;
- require that the amendment of our bylaws be approved by the affirmative vote of a majority of directors then in office or 66-2/3% of our outstanding common stock entitled to vote thereon;
- do not provide for cumulative voting rights, thereby allowing the holders of a majority of the shares of common stock entitled to vote in any election of directors to elect all of the directors standing for election; and
- provide that special meetings of our stockholders may be called only by the chairman or vice chairman of our board of directors, our chief executive officer, or a majority of our board of directors.

Delaware Anti-Takeover Law. Our fourth amended and restated certificate of incorporation provides that we are governed by the provisions of Section 203 of the Delaware General Corporation Law, or Section 203. Section 203 generally prohibits a public Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a period of three years after the date of the transaction in which the person became an interested stockholder, unless:

- prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;

- the interested stockholder owned at least 85% of the voting stock of the corporation outstanding upon consummation of the transaction, excluding for purposes of determining the number of shares outstanding (1) shares owned by persons who are directors and also officers and (2) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or subsequent to the consummation of the transaction, the business combination is approved by the board of directors and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66-2/3% of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 defines a business combination to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, lease, pledge or other disposition involving the interested stockholder of 10% or more of the assets of the corporation;
- subject to exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder;
- subject to exceptions, any transaction involving the corporation that has the effect of increasing the proportionate share of the stock of any class or series of the corporation beneficially owned by the interested stockholder; and
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an interested stockholder as any entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with or controlling or controlled by the entity or person.

The Nasdaq Global Select Market

Our common stock is listed on the Nasdaq Global Select Market under the symbol “OPTN.”

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Broadridge Corporate Issuer Solutions, Inc. The transfer agent’s address is 1717 Arch St., Suite 1300, Philadelphia, Pennsylvania 19103.

INDEMNIFICATION AGREEMENT

This Indemnification Agreement (this "Agreement") is made as of _____, 201___ by and between OptiNose, Inc., a Delaware corporation (the "Corporation"), in its own name and on behalf of its direct and indirect subsidiaries, and _____, an individual ("Indemnitee"). This Agreement supersedes and replaces any and all previous Agreements between the Corporation and Indemnitee covering the subject matter of this Agreement.

RECITALS:

WHEREAS, directors, officers, employees, controlling persons, fiduciaries and other agents ("Representatives") in service to corporations or business enterprises are being increasingly subjected to expensive and time-consuming litigation relating to, among other things, matters that traditionally would have been brought only against the corporation or business enterprise itself;

WHEREAS, the Board of Directors of the Company (the "Board") believes that highly competent persons have become more reluctant to serve corporations as Representatives unless they are provided with adequate protection through insurance and adequate indemnification against inordinate risks of claims and actions against them arising out of their service to and activities on behalf of the corporation or business enterprise;

WHEREAS, the Board has determined that the increased difficulty in attracting and retaining highly competent persons is detrimental to the best interests of the Corporation and its stockholders and that the Corporation should act to assure such persons that there will be increased certainty of protection against inordinate risks of claims and actions against them arising out of their service to and activities on behalf of the Corporation;

WHEREAS, it is reasonable, prudent and necessary for the Corporation contractually to obligate itself to indemnify, and to advance expenses on behalf of, such persons to the fullest extent permitted by applicable law so that they will serve or continue to serve the Corporation free from undue concern regarding such risks;

WHEREAS, (a) the Amended and Restated Bylaws of the Corporation (the "Bylaws") require indemnification of the officers and directors of the Corporation, (b) Indemnitee may also be entitled to indemnification pursuant to the General Corporation Law of the State of Delaware, as it may be amended from time to time (the "DGCL") and (c) the Bylaws and the DGCL expressly provide that the indemnification provisions set forth therein are not exclusive and thereby contemplate that contracts may be entered into between the Corporation and its Representatives with respect to indemnification;

WHEREAS, this Agreement is a supplement to and in furtherance of the Bylaws and any resolutions adopted pursuant thereto, and shall not be deemed a substitute therefore, nor to diminish or abrogate any rights of Indemnitee thereunder; and

WHEREAS, (a) Indemnitee does not regard the protection available under the Bylaws and insurance as adequate in the present circumstances, (b) Indemnitee may not be willing to serve or continue to serve as a Representative without adequate protection, (c) the Corporation desires Indemnitee to serve or continue to serve in such capacity and (d) Indemnitee is willing to serve, continue to serve and to take on additional service for or on behalf of the Corporation on the condition that he/she be so indemnified.

AGREEMENT:

NOW, THEREFORE, in consideration of the premises and the covenants contained herein, the Corporation and Indemnitee do hereby covenant and agree as follows:

Section 1. Definitions.

(a) As used in this Agreement:

"Agreement" shall have the meaning ascribed to such term in the Preamble hereto.

"Beneficial Owner" shall have the meaning given to such term in Rule 13d-3 under the Exchange Act (as defined below); provided, however, that Beneficial Owner shall exclude any Person otherwise becoming a Beneficial Owner by reason of the stockholders of the Corporation approving a merger of the Corporation with another entity.

"Board" shall have the meaning ascribed to such term in the Recitals hereto.

"Bylaws" shall have the meaning ascribed to such term in the Recitals hereto.

"Certificate of Incorporation" shall mean the Fourth Amended and Restated Certificate of Incorporation of the Corporation.

A "Change in Control" shall be deemed to occur upon the earliest to occur after the date of this Agreement of any of the following events:

i. Acquisition of Stock by Third Party. Any Person (as defined below), other than the Sponsor Entities (as defined below), is or becomes the Beneficial Owner (as defined below), directly or indirectly, of securities of the Corporation representing fifteen percent (15%) or more of the combined voting power of the Corporation's then outstanding securities, unless the change in relative Beneficial Ownership of the Corporation's securities by any Person results solely from a reduction in the aggregate number of outstanding shares of securities entitled to vote generally in the election of directors;

ii. Change in Board of Directors. During any period of two (2) consecutive years (not including any period prior to the execution of this Agreement), individuals who at the beginning of such period constitute the Board, and any new director (other than a director designated by a person who has entered into an agreement with the Corporation to effect a transaction described herein) whose election by the Board or nomination for election by the Corporation's stockholders was approved by a vote of at least two-thirds of the directors then still in office who either were directors at the beginning of the period or whose election or nomination for election was previously so approved, cease for any reason to constitute at least a majority of the members of the Board;

iii. Corporate Transactions. The effective date of a merger or consolidation of the Corporation with any other entity, other than a merger or consolidation which would result in the voting securities of the Corporation outstanding immediately prior to such merger or consolidation continuing to represent (either by remaining outstanding or by being converted into voting securities of the surviving entity in any such transaction) more than fifty percent (50%) of the combined voting power of the voting securities of such surviving entity outstanding immediately after such merger or consolidation and with the power to elect at least a majority of the board of directors or other governing body of such Surviving Entity;

iv. Liquidation. The approval by the stockholders of the Corporation of a complete liquidation of the Corporation or an agreement for the sale or disposition by the Corporation of all or substantially all of the Corporation's assets; and

v. Other Events. There occurs any other event of a nature that would be required to be reported in response to Item 6(e) of Schedule 14A of Regulation 14A (or a response to any similar item on any similar schedule or form) promulgated under the Exchange Act (as defined below), whether or not the Corporation is then subject to such reporting requirement.

"Corporate Status" describes the status of an individual who is or was a Representative of an Enterprise.

"Corporation" shall have the meaning ascribed to such term in the Preamble hereto.

"DGCL" shall have the meaning ascribed to such term in the Recitals hereto.

"Enterprise" shall mean the Corporation and any other Person, employee benefit plan, joint venture or other enterprise of which Indemnitee is or was serving at the request of the Corporation as a Representative.

"Exchange Act" shall mean the Securities Exchange Act of 1934, as amended from time to time, and the rules and regulations thereunder.

"Expenses" shall include all reasonable costs, expenses, fees and charges, including, without limitation, attorneys' fees, retainers, court costs, transcript costs, fees of experts, witness fees, travel expenses, duplicating costs, printing and binding costs, telephone charges, postage, delivery service fees, and all other disbursements or expenses of the types customarily incurred in connection with prosecuting, defending, preparing to prosecute or defend, investigating, being or preparing to be a witness in, or otherwise participating in, a Proceeding. Expenses also shall include, without limitation, (i) expenses incurred in connection with any appeal resulting from any Proceeding, including, without limitation, the premium, security for, and other costs relating to any cost bond, supersedes bond, or other appeal bond or its equivalent, (ii) for purposes of Section 12(d) only, expenses incurred by Indemnitee in connection with the interpretation, enforcement or defense of Indemnitee's rights under this Agreement, by litigation or otherwise, (iii) any federal, state, local or foreign taxes imposed on Indemnitee as a result of the actual or deemed receipt of any payments under this Agreement (on a grossed up basis), (iv) excise taxes and penalties under the Employee Retirement Income Security Act of 1974, and (v) any interest, assessments or other charges in respect of the foregoing.

"Indemnitee" shall have the meaning ascribed to such term in the Preamble hereto.

"Indemnity Obligations" shall mean all obligations of the Corporation to Indemnitee under this Agreement, including, without limitation, the Corporation's obligations to provide indemnification to Indemnitee and advance Expenses to Indemnitee under this Agreement.

"Independent Counsel" shall mean a law firm, or a member of a law firm, that is experienced in matters of corporation law and neither presently is, nor in the past five (5) years has been, retained to represent: (i) the Corporation or Indemnitee in any matter material to either such party (other than with respect to matters concerning the Indemnitee under this Agreement, or of other indemnitees under similar indemnification agreements) or (ii) any other party to the Proceeding giving rise to a claim for indemnification hereunder; provided, however, that the term "Independent Counsel" shall not include any person who, under the applicable standards of professional conduct then prevailing, would have a conflict of interest in representing either the Corporation or Indemnitee in an action to determine Indemnitee's rights under this Agreement.

"Liabilities" shall mean all claims, liabilities, damages, losses, judgments, orders, fines, penalties and other amounts payable in connection with, arising out of, in respect of, relating to or occurring as a direct or indirect consequence of, any Proceeding, including, without limitation, amounts paid in whole or partial settlement of any Proceeding, all Expenses incurred in complying with any judgment, order or decree issued or entered in connection with any Proceeding or any settlement agreement, stipulation or consent decree entered into or issued in settlement of any Proceeding, and any consequential damages resulting from any Proceeding or the settlement, judgment, or result thereof.

"Person" shall mean any individual, corporation, partnership, limited partnership, limited liability company, trust, governmental agency or body or any other legal entity.

"Proceeding" shall include any threatened, pending or completed action, claim, suit, counterclaim, cross claim, arbitration, mediation, alternate dispute resolution mechanism, formal or informal hearing, inquiry or investigation, administrative hearing or any other actual, threatened or completed judicial, administrative or arbitration proceeding (including, without limitation, any such proceeding under the Securities Act of 1933, as amended, or the Exchange Act or any other federal law, state law, statute or regulation), whether brought in the right of the Corporation or otherwise, and whether of a civil, criminal, administrative legislative or investigative nature, including any appeal therefrom, in which Indemnitee was, is or will be, or is threatened to be, involved as a party, potential party, non-party witness or otherwise (i) by reason of the fact that Indemnitee is or was a Representative of the Corporation, (ii) by reason of any actual or alleged action taken by Indemnitee (or a failure to take action by Indemnitee) or of any action (or failure to act) on Indemnitee's part while acting as Representative of the Corporation or (iii) by reason of the fact that Indemnitee is or was serving at the request of the Corporation as a Representative of another Person, whether or not serving in such capacity at the time any liability or Expense is incurred for which indemnification, reimbursement, or advancement of Expenses can be provided under this Agreement. If the Indemnitee believes in good faith that a given situation may lead to or culminate in the institution of a Proceeding, this shall be considered a Proceeding under this paragraph.

"Representative" shall have the meaning ascribed to such term in the Recitals hereto.

"Sponsor Entities" shall mean funds affiliated with Avista Capital Partners and any of their respective Affiliates who beneficially own shares of common stock, par value $0.001 per share, of the Corporation, and any securities into which such shares of common stock shall have been changed or any securities resulting from any reclassification or recapitalization of such shares of common stock from time to time; provided, however, that neither the Corporation nor any of its subsidiaries shall be considered Sponsor Entities hereunder.

"Submission Date" shall have the meaning ascribed to such term in Section 11(a).

(b) For the purpose hereof, references to "fines" shall include any excise tax assessed with respect to any employee benefit plan; references to "serving at the request of the Corporation" shall include any service as a Representative of the Corporation which imposes duties on, or involves services by, such Representative with respect to an employee benefit plan, its participants or beneficiaries; and a Person who acted in good faith and in a manner he/she reasonably believed to be in the best interests of the participants and beneficiaries of an employee benefit plan shall be deemed to have acted in manner "not opposed to the best interests of the Corporation" as referred to in this Agreement.

Section 2. Indemnity in Third-Party Proceedings. The Corporation shall indemnify and hold harmless Indemnitee, to the fullest extent permitted by applicable law, from and against all Liabilities and Expenses suffered or incurred by Indemnitee or on Indemnitee's behalf in connection with or as a consequence of any Proceeding (other than any Proceeding brought by or in the right of the Corporation to procure a judgment in its favor which

shall be governed by the provisions set forth in Section 3 below), if Indemnitee acted in good faith and in a manner he/she reasonably believed to be in, or not opposed to, the best interests of the Corporation and, in the case of a criminal proceeding, had no reasonable cause to believe that his conduct was unlawful. For the avoidance of doubt, a finding, admission or stipulation that an Indemnitee has not met such applicable standard of conduct or that Indemnitee acted with gross negligence or recklessness shall not, of itself, be a defense to any action pursuant to this Agreement or create a presumption that such Indemnitee has failed to meet the standard of conduct required for indemnification in this Section 2.

Section 3. Indemnity in Proceedings by or in the Right of the Corporation. The Corporation shall indemnify and hold harmless Indemnitee, to the fullest extent permitted by applicable law, from and against all Liabilities and Expenses suffered or incurred by Indemnitee or on Indemnitee's behalf in connection with or as a consequence of any Proceeding brought by or in the right of the Corporation to procure a judgment in its favor, or any claim, issue or matter therein, if Indemnitee acted in good faith and in a manner he/she reasonably believed to be in, or not opposed, to the best interests of the Corporation. No indemnification for Liabilities and Expenses shall be made under this Section 3 in respect of any claim, issue or matter as to which Indemnitee shall have been finally adjudged by a court to be liable to the Corporation, unless and only to the extent that the Delaware Court of Chancery or any court in which the Proceeding was brought shall determine upon application that, despite the adjudication of liability, but in view of all the circumstances of the case, Indemnitee is fairly and reasonably entitled to indemnification for such Liabilities and Expenses which the Court of Chancery or such other court shall deem proper. For the avoidance of doubt, a finding, admission or stipulation that an Indemnitee has not met such applicable standard of conduct or that Indemnitee acted with gross negligence or recklessness shall not, of itself, be a defense to any action pursuant to this Agreement or create a presumption that such Indemnitee has failed to meet the standard of conduct required for indemnification in this Section 3.

Section 4. Indemnification for Expenses of a Party Who is Wholly or Partly Successful. Notwithstanding any other provisions of this Agreement, and without limiting the rights of Indemnitee under any other provision hereof, to the extent that Indemnitee is a party to (or a participant in) any Proceeding and is successful on the merits or otherwise (including, without limitation, settlement thereof), as to one or more but less than all claims, issues or matters in such Proceeding, in whole or in part, then the Corporation shall indemnify Indemnitee, to the fullest extent permitted by applicable law, against all Liabilities and Expenses actually and reasonably incurred by Indemnitee or on Indemnitee's behalf, in connection with or as a consequence of each successfully resolved claim, issue or matter. For purposes of this Section 4 and without limitation, the termination of any claim, issue or matter in such a Proceeding by dismissal, with or without prejudice, shall be deemed to be a successful result as to such claim, issue or matter.

Section 5. Partial Indemnification. If Indemnitee is entitled under any provision of this Agreement to indemnification by the Corporation for some or a portion of Expenses, but not, however, for the total amount thereof, the Corporation shall nevertheless indemnify Indemnitee for the portion thereof to which Indemnitee is entitled.

Section 6. Indemnification for Expenses of a Witness. Notwithstanding any other provision of this Agreement, to the extent that Indemnitee is, by reason of Indemnitee's Corporate Status, a witness in any Proceeding to which Indemnitee is not a party, Indemnitee shall be indemnified to the fullest extent permitted by applicable law against all Liabilities and Expenses suffered or incurred by him or on his behalf in connection therewith.

Section 7. Additional Indemnification.

(a) Notwithstanding any limitation in Sections 2, 3, 4 or 5, the Corporation shall indemnify Indemnitee to the fullest extent permitted by applicable law if Indemnitee is a party to, or threatened to be made a party to, any Proceeding (including, without limitation, a Proceeding by or in the right of the Corporation to procure a judgment in its favor), by reason of Indemnitee's Corporate Status.

(b) For purposes of Section 7(a), the meaning of the phrase "to the fullest extent permitted by applicable law" shall include, but not be limited to:

(i) to the fullest extent permitted by the provision of the DGCL that authorizes or contemplates additional indemnification by agreement, or the corresponding provision of any amendment to, or replacement of, the DGCL, and

(ii) to the fullest extent authorized or permitted by any amendments to, or replacements of, the DGCL adopted after the date of this Agreement that increase the extent to which a corporation may indemnify its officers and directors.

Section 8. Exclusions. Notwithstanding any provision in this Agreement, the Corporation shall not be obligated under this Agreement to make any indemnification payment in connection with any claim involving Indemnitee:

(a) for which payment has actually been made to or on behalf of Indemnitee under any insurance policy or other indemnity provision, except with respect to any excess beyond the amount paid under any insurance policy or other indemnity provision; or

(b) subject to Section 14, for (i) an accounting of profits made from the purchase and sale (or sale and purchase) by Indemnitee of securities of the Corporation within the meaning of Section 16(b) of the Exchange Act (as defined in Section 1(a) hereof) or similar provisions of state statutory law or common law, (ii) any reimbursement of the Corporation by the Indemnitee of any bonus or other incentive-based or equity-based compensation or of any profits realized by the Indemnitee from the sale of securities of the Corporation, as required in each case under the Exchange Act (including any such reimbursements that arise from an accounting restatement of the Corporation pursuant to Section 304 of the Sarbanes-Oxley Act of 2002 (the "Sarbanes-Oxley Act"), or the payment to the Corporation of profits arising from the purchase and sale by Indemnitee of securities in violation of Section 306 of the Sarbanes-Oxley Act) or (iii) any reimbursement of the Corporation by Indemnitee of any compensation pursuant to any compensation recoupment or clawback policy adopted by the Board or the compensation committee of the Board to comply with stock exchange listing requirements implementing Section 10D of the Exchange Act; or

(c) except as provided in Section 13(d) of this Agreement, in connection with any Proceeding (or any part of any Proceeding) initiated by Indemnitee, including any Proceeding (or any part of any Proceeding) initiated by Indemnitee against the Corporation or its directors, officers, employees or other indemnitees, unless (i) the Board authorized the Proceeding (or any part of any Proceeding) prior to its initiation or (ii) the Corporation provides the indemnification, in its sole discretion, pursuant to the powers vested in the Corporation under applicable law.

Section 9. Advances of Expenses. Notwithstanding any provision of this Agreement to the contrary (other than Section 13(d)), the Corporation shall advance, to the fullest extent permitted by law, Expenses incurred by Indemnitee in connection with any Proceeding (or part of any Proceeding) not initiated by Indemnitee or any Proceeding initiated by Indemnitee with the prior approval of the Board, and such advancement shall be made within ten (10) days after the receipt by the Corporation of a statement or statements requesting such advances from time to time, whether prior to, or after, final disposition of any Proceeding. Advances shall be unsecured and interest free. Indemnitee shall be entitled to continue to receive advancement of Expenses pursuant to this Section 9 unless and until the matter of Indemnitee's entitlement to indemnification hereunder has been finally adjudicated by court order or judgment from which no further right or appeal exists. Advances shall be made without regard to Indemnitee's ability to repay Expenses and without regard to Indemnitee's ultimate entitlement to indemnification under the other provisions of this Agreement. In accordance with Section 13(d), advances shall include any and all Expenses incurred pursuing an action to enforce this right of advancement, including, without limitation, Expenses incurred preparing and forwarding statements to the Corporation to support the advances claimed. Indemnitee shall qualify for advances upon the execution and delivery to the Corporation of this Agreement, which shall constitute an undertaking, providing that Indemnitee undertakes to repay the amounts advanced (without interest) to the extent that it is ultimately determined that Indemnitee is not entitled to be indemnified by the Corporation. No other form of undertaking shall be required other than the execution of this Agreement. This Section 9 shall not apply to any claim made by Indemnitee for which indemnity is excluded pursuant to Section 8.

Section 10. Procedure for Notification and Defense of Claim.

(a) Indemnitee shall notify the Corporation in writing of any Proceeding with respect to which Indemnitee intends to seek indemnification or advancement of Expenses hereunder as soon as reasonably practicable following the receipt by Indemnitee of written notice thereof. The written notification to the Corporation shall include a description of the nature of the Proceeding and the facts underlying the Proceeding. To obtain indemnification under this Agreement, Indemnitee shall submit to the Corporation a written request, including therein or therewith such documentation and information as is reasonably available to Indemnitee and is reasonably necessary to determine whether and to what extent Indemnitee is entitled to indemnification following the final disposition of such Proceeding. Any delay or failure by Indemnitee to notify the Corporation hereunder will not relieve the Corporation from any liability which it may have to Indemnitee hereunder or otherwise than under this Agreement, nor shall such delay or failure constitute a waiver by Indemnitee of any rights under this Agreement. The Secretary of the Corporation shall, promptly upon receipt of such a request for indemnification, advise the Board in writing that Indemnitee has requested indemnification.

(b) In the event Indemnitee seeks indemnification and/or advancement of Expenses with respect to any Proceeding, Indemnitee may, at Indemnitee's option, (i) retain legal counsel selected by Indemnitee and approved by the Corporation (which approval shall not to be unreasonably withheld, conditioned or delayed) to defend Indemnitee in such Proceeding, at the sole expense of the Corporation or (ii) have the Corporation assume the defense of Indemnitee in the Proceeding, in which case the Corporation shall assume the defense of such Proceeding with legal counsel selected by the Corporation and approved by Indemnitee (which approval shall not be unreasonably withheld, conditioned or delayed) within ten (10) days of the Corporation's receipt of written notice of Indemnitee's election to cause the Corporation to do so. If the Corporation is required to assume the defense of any such Proceeding, it shall engage legal counsel for such defense, and shall be solely responsible for all Expenses of such legal counsel and otherwise of such defense. Such legal counsel may represent both Indemnitee and the Corporation (and/or any other party or parties entitled to be indemnified by the Corporation with respect to such matter) unless, in the reasonable opinion of legal counsel to Indemnitee, there is a conflict of interest between Indemnitee and the Corporation (or any other such party or parties) or there are legal defenses available to Indemnitee that are not available to the Corporation (or any such other party or parties). Notwithstanding either party's assumption of responsibility for defense of a Proceeding, each party shall have the right to engage separate legal counsel at its own expense. The party having responsibility for defense of a Proceeding shall provide the other party and its legal counsel with all copies of pleadings and material correspondence relating to the Proceeding. Indemnitee and the Corporation shall reasonably cooperate in the defense of any Proceeding with respect to which indemnification is sought hereunder, regardless of whether the Corporation or Indemnitee assumes the defense thereof. Indemnitee may not settle or compromise any Proceeding without the prior written consent of the Corporation (which consent shall not be unreasonably withheld, conditioned or delayed). The Corporation may not settle or compromise any Proceeding without the prior written consent of Indemnitee (which consent shall not be unreasonably withheld, conditioned or delayed).

Section 11. Procedure Upon Application for Indemnification.

(a) Upon receipt of a written request by Indemnitee for indemnification pursuant to Section 10(a) (the "Submission Date"), if any determination by the Corporation is required by applicable law with respect to Indemnitee's ultimate entitlement to indemnification, such determination shall be made (i) if a Change in Control shall have occurred, by Independent Counsel in a written opinion to the Board, a copy of which shall be delivered to Indemnitee; or (ii) if a Change in Control shall not have occurred, (A) by a majority vote of the Disinterested Directors, even though less than a quorum of the Board, (B) by a committee of Disinterested Directors designated by a majority vote of the Disinterested Directors, even though less than a quorum of the Board, (C) if there are no such Disinterested Directors or, if such Disinterested Directors so direct, by Independent Counsel in a written opinion to the Board, a copy of which shall be delivered to Indemnitee or (D) if so directed by the Board, by the stockholders of the

Corporation. If it is so determined that Indemnitee is entitled to indemnification, payment to Indemnitee shall be made within ten (10) days after such determination. Indemnitee shall cooperate with the Person(s) making such determination with respect to Indemnitee's entitlement to indemnification, including, without limitation, providing to such Person(s), upon reasonable advance request, any documentation or information which is not privileged or otherwise protected from disclosure and which is reasonably available to Indemnitee and reasonably necessary to such determination. Any Expenses incurred by Indemnitee in so cooperating with the Person(s) making such determination shall be borne by the Corporation (irrespective of the determination as to Indemnitee's entitlement to indemnification) and the Corporation hereby indemnifies and agrees to hold Indemnitee harmless therefrom. The Corporation will not deny any written request for indemnification hereunder made in good faith by Indemnitee unless a determination as to Indemnitee's entitlement to such indemnification described in this Section 11(a) has been made. The Corporation agrees to pay Expenses of the Independent Counsel referred to above and to fully indemnify the Independent Counsel against any and all Expenses, claims, liabilities and damages arising out of or relating to this Agreement or its engagement pursuant hereto.

(b) In the event that the determination of entitlement to indemnification is to be made by the Independent Counsel pursuant to Section 11(a) hereof, the Independent Counsel shall be selected as provided in this Section 11(b). If a Change in Control has not occurred, the Independent Counsel shall be selected by the Board, and the Corporation shall give written notice to Indemnitee advising Indemnitee of the identity of the Independent Counsel so selected. If a Change in Control has occurred, the Independent Counsel shall be selected by Indemnitee (unless Indemnitee shall request that such selection be made by the Board, in which event the preceding sentence shall apply), and Indemnitee shall give written notice to the Corporation advising it of the identity of the Independent Counsel so selected. In either event, Indemnitee or the Corporation, as the case may be, may, within ten (10) days after such written notice of selection shall have been given, deliver to the Corporation or to Indemnitee, as the case may be, a written objection to such selection; provided, however, that such objection may be asserted only on the ground that the Independent Counsel so selected does not meet the requirements of "Independent Counsel" as defined in Section 1(a) of this Agreement, and the objection shall set forth with particularity the factual basis of such assertion. Absent a proper and timely objection, the person so selected shall act as Independent Counsel. If such written objection is so made and substantiated, the Independent Counsel so selected may not serve as Independent Counsel unless and until such objection is withdrawn or the Delaware Court of Chancery has determined that such objection is without merit. If, within twenty (20) days after the later of submission by Indemnitee of a written request for indemnification pursuant to Section 10(a) hereof and the final disposition of the Proceeding, no Independent Counsel shall have been selected and not objected to, either the Corporation or Indemnitee may petition the Delaware Court of Chancery for resolution of any objection which shall have been made by the Corporation or Indemnitee to the other's selection of Independent Counsel and/or for the appointment as Independent Counsel of a person selected by such court or by such other person as such court shall designate, and the person with respect to whom all objections are so resolved or the person so appointed shall act as Independent Counsel under Section 11(a) hereof. Upon the due commencement of any judicial proceeding or arbitration pursuant to Section 13(a) of this Agreement, Independent Counsel shall be discharged and relieved of any further responsibility in such capacity (subject to the applicable standards of professional conduct then prevailing).

Section 12. Presumptions and Effect of Certain Proceedings.

(a) In making a determination with respect to entitlement to indemnification hereunder, the Person(s) making such determination shall, to the fullest extent permitted by law, presume that Indemnitee is entitled to indemnification under this Agreement if Indemnitee has submitted a request for indemnification in accordance with Section 10(a) of this Agreement, and the Corporation shall, to the fullest extent permitted by law, have the burden of proof to overcome that presumption with clear and convincing evidence in connection with the making by any Person(s) of any determination contrary to that presumption. Neither the failure of the Corporation (including, without limitation, by its directors or independent legal counsel) to have made a determination prior to the commencement of any action pursuant to this Agreement that indemnification is proper in the circumstances because Indemnitee has met the

applicable standard of conduct, nor an actual determination by the Corporation (including, without limitation, by its directors or independent legal counsel) that Indemnitee has not met such applicable standard of conduct, shall be a defense to the action or create a presumption that Indemnitee has not met the applicable standard of conduct.

(b) Subject to Section 12(e), if the Person(s) empowered or selected under Section 10 hereof to determine whether Indemnitee is entitled to indemnification shall not have made a determination within sixty (60) days after receipt by the Corporation of the request therefore, the requisite determination of entitlement to indemnification shall, to the fullest extent permitted by law, be deemed to have been made and Indemnitee shall be entitled to such indemnification, absent a prohibition of such indemnification under applicable law; provided, however, that such sixty (60) day period may be extended for a reasonable time, not to exceed an additional thirty (30) days, if (i) the determination is to be made by the Independent Counsel and there is an objection to the selection of the Independent Counsel and (ii) the Person(s) making such determination requires such additional time for the obtaining or evaluating of documentation and/or information relating thereto; and provided, further, that the foregoing provisions of this Section 12(b) shall not apply (i) if the determination of entitlement to indemnification is to be made by the stockholders pursuant to Section 11(a) of this Agreement and if (A) within fifteen (15) days after receipt by the Corporation of the request for such determination the Board has resolved to submit such determination to the stockholders for their consideration at an annual meeting thereof to be held within seventy-five (75) days after such receipt and such determination is made thereat, or (B) a special meeting of stockholders is called within fifteen (15) days after such receipt for the purpose of making such determination, such meeting is held for such purpose within sixty (60) days after having been so called and such determination is made thereat.

(c) The termination of any Proceeding or of any claim, issue or matter therein, by judgment, order, settlement or conviction, or upon a plea of *nolo contendere* or its equivalent, shall not (except as otherwise expressly provided in this Agreement) of itself adversely affect the right of Indemnitee to indemnification or create a presumption that Indemnitee did not act in good faith and in a manner which he/she reasonably believed to be in, or not opposed to, the best interests of the Corporation or, with respect to any criminal Proceeding, that Indemnitee had reasonable cause to believe that Indemnitee's conduct was unlawful.

(d) Reliance as Safe Harbor. For purposes of any determination of good faith, Indemnitee shall be deemed to have acted in good faith if Indemnitee's action is based on the records or books of account of the Enterprise, including financial statements, or on information supplied to Indemnitee by the officers of the Enterprise in the course of their duties, or on the advice of legal counsel for the Enterprise, or on information or records given or reports made to the Enterprise by an independent certified public accountant or by an appraiser or other expert selected with reasonable care by the Enterprise. The provisions of this Section 12(d) shall not be deemed to be exclusive or to limit in any way the other circumstances in which Indemnitee may be deemed to have met the applicable standard of conduct set forth in this Agreement.

(e) Actions of Others. The knowledge and/or actions, or failure to act, of any Representative (other than Indemnitee) of the Enterprise shall not be imputed to Indemnitee for purposes of determining the right to indemnification under this Agreement.

Section 13. Remedies of Indemnitee.

(a) Subject to Section 12(d), in the event that (i) a determination is made pursuant to Section 11 of this Agreement that Indemnitee is not entitled to indemnification under this Agreement, (ii) advancement of Expenses is not timely made pursuant to Section 9 of this Agreement, (iii) no determination of entitlement to indemnification shall have been made pursuant to Section 11(a) of this Agreement within ninety (90) days after the Submission Date, (iv) payment of indemnification is not made pursuant to Section 4, 5, 6 or 11(a) of this Agreement within ten (10) days after receipt by the Corporation of a written

request therefore, (v) payment of indemnification pursuant to Section 2, 3 or 7 of this Agreement is not made within ten (10) days after a determination has been made that Indemnitee is entitled to indemnification or (vi) in the event that the Corporation or any other person takes or threatens to take any action to declare this Agreement void or unenforceable, or institutes any litigation or other action or Proceeding designed to deny, or to recover from, Indemnitee, the benefits provided or intended to be provided to Indemnitee hereunder, Indemnitee shall be entitled to an adjudication by a court of Indemnitee's entitlement to such indemnification and/or advancement of Expenses. Alternatively, Indemnitee, at Indemnitee's option, may seek an award in arbitration to be conducted by a single arbitrator pursuant to the Commercial Arbitration Rules of the American Arbitration Association. Indemnitee shall commence such proceeding seeking an adjudication or an award in arbitration within one hundred and eighty (180) days following the date on which Indemnitee first has the right to commence such proceeding pursuant to this Section 13(a). The Corporation shall not oppose Indemnitee's right to seek any such adjudication or award in arbitration.

(b) In the event that a determination shall have been made pursuant to Section 11 of this Agreement that Indemnitee is not entitled to indemnification, any judicial proceeding or arbitration commenced pursuant to this Section 13 shall be conducted in all respects as a *de novo* trial, or arbitration, on the merits and Indemnitee shall not be prejudiced by reason of that adverse determination. In any judicial proceeding or arbitration commenced pursuant to this Section 13, the Corporation shall have the burden of proving by clear and convincing evidence Indemnitee is not entitled to indemnification or advancement of Expenses, as the case may be.

(c) If a determination shall have been made pursuant to Section 11 of this Agreement that Indemnitee is entitled to indemnification, the Corporation shall be bound by such determination in any judicial proceeding or arbitration commenced pursuant to this Section 13, absent (i) a misstatement by the Indemnitee of a material fact, or an omission by the Indemnitee of a material fact necessary to make the Indemnitee's statement not materially misleading, in connection with the request for indemnification, or (ii) a prohibition of such indemnification under applicable law.

(d) The Corporation shall, to the fullest extent not prohibited by law, be precluded from asserting in any judicial proceeding or arbitration commenced pursuant to this Section 13 that the procedures and presumptions of this Agreement are not valid, binding and enforceable and shall stipulate in any such court or before any such arbitrator that the Corporation is bound by all the provisions of this Agreement. It is the intent of the Corporation that, to the fullest extent permitted by law, Indemnitee not be required to incur legal fees or other Expenses associated with the interpretation, enforcement or defense of Indemnitee's rights under this Agreement by litigation or otherwise because the cost and expense thereof would substantially detract from the benefits intended to be extended to Indemnitee hereunder. In addition, the Corporation shall, to the fullest extent permitted by law, indemnify Indemnitee against any and all such Expenses and, if requested by Indemnitee, shall (within ten (10) days after receipt by the Corporation of a written request therefore) advance, to the fullest extent not prohibited by law, such Expenses to Indemnitee, which are incurred by Indemnitee in connection with any action brought by Indemnitee for indemnification or advancement of Expenses from the Corporation under this Agreement or under any directors' and officers' liability insurance policies maintained by the Corporation if, in the case of indemnification, Indemnitee is wholly successful on the underlying claims; if Indemnitee is not wholly successful on the underlying claims, then such indemnification shall be only in connection with each successfully resolved claim, issue or matter, or otherwise as permitted by law, whichever is greater.

(e) Notwithstanding anything in this Agreement to the contrary, no determination as to entitlement to indemnification under this Agreement shall be required to be made prior to the final disposition of the Proceeding; provided, that in absence of any such determination with respect to such Proceeding, the Corporation shall pay Liabilities and advance Expenses with respect to such Proceeding as if Indemnitee has been determined to be entitled to indemnification and advancement of Expenses with respect to such Proceeding.

Section 14. Non-Exclusivity; Survival of Rights; Insurance; Subrogation.

(a) The rights of indemnification and to receive advancement of Expenses as provided by this Agreement shall not be deemed exclusive of any other rights to which Indemnitee may at any time be entitled under applicable law, the Certificate of Incorporation, the Bylaws, any agreement, a vote of stockholders, a resolution of directors or otherwise. No amendment, alteration or repeal of this Agreement or of any provision hereof shall limit or restrict any right of Indemnitee under this Agreement in respect of any action taken or omitted by such Indemnitee in Indemnitee's Corporate Status prior to such amendment, alteration or repeal. To the extent that a change in applicable law, whether by statute or judicial decision, permits greater indemnification or advancement of Expenses than would be afforded currently under the Certificate of Incorporation, the Bylaws and/or this Agreement, it is the intent of the parties hereto that Indemnitee shall enjoy by this Agreement the greater benefits so afforded by such change. No right or remedy herein conferred is intended to be exclusive of any other right or remedy, and every other right and remedy shall be cumulative and in addition to every other right and remedy given hereunder or now or hereafter existing at law or in equity or otherwise. The assertion or employment of any right or remedy hereunder, or otherwise, shall not prevent the concurrent assertion or employment of any other right or remedy.

(b) The Corporation hereby acknowledges that Indemnitee may have certain rights to indemnification, advancement of Expenses and/or insurance provided by one or more Persons with whom or which Indemnitee may be associated (including, without limitation, any Sponsor Entity). The Corporation hereby acknowledges and agrees that (i) the Corporation shall be the indemnitor of first resort with respect to any Proceeding, Expense, Liability or matter that is the subject of the Indemnity Obligations, (ii) the Corporation shall be primarily liable for all Indemnity Obligations and any indemnification afforded to Indemnitee in respect of any Proceeding, Expense, Liability or matter that is the subject of Indemnity Obligations, whether created by law, organizational or constituent documents, contract (including, without limitation, this Agreement) or otherwise, (iii) any obligation of any other Persons with whom or which Indemnitee may be associated (including, without limitation, any Sponsor Entity) to indemnify Indemnitee and/or advance Expenses to Indemnitee in respect of any proceeding shall be secondary to the obligations of the Corporation hereunder, (iv) the Corporation shall be required to indemnify Indemnitee and advance Expenses to Indemnitee hereunder to the fullest extent provided herein without regard to any rights Indemnitee may have against any other Person with whom or which Indemnitee may be associated (including, without limitation, any Sponsor Entity) or insurer of any such Person and (v) the Corporation irrevocably waives, relinquishes and releases any other Person with whom or which Indemnitee may be associated (including, without limitation, any Sponsor Entity) from any claim of contribution, subrogation or any other recovery of any kind in respect of amounts paid by the Corporation hereunder. In the event that any other Person with whom or which Indemnitee may be associated (including, without limitation, any Sponsor Entity) or their insurers advances or extinguishes any liability or loss which is the subject of any Indemnity Obligation owed by the Corporation or payable under any insurance policy provided under this Agreement, such payor shall have a right of subrogation against the Corporation or its insurer or insurers for all amounts so paid which would otherwise be payable by the Corporation or its insurer or insurers under this Agreement. In no event will payment of an Indemnity Obligation of the Corporation under this Agreement by any other Person with whom or which Indemnitee may be associated (including, without limitation, any Sponsor Entity) or their insurers, affect the obligations of the Corporation hereunder or shift primary liability for any Indemnity Obligation to any other Person with whom or which Indemnitee may be associated (including, without limitation, any Sponsor Entity). Any indemnification and/or insurance or advancement of Expenses provided by any other Person with whom or which Indemnitee may be associated (including, without limitation, any Sponsor Entity), with respect to any liability arising as a result of Indemnitee's Corporate Status or capacity as an officer or director of any Person, is specifically in excess of any Indemnity Obligation of the Corporation or valid and any collectible insurance (including, without limitation, any malpractice insurance or professional errors and omissions insurance) provided by the Corporation under this Agreement, and any obligation to provide indemnification and/or insurance or advance Expenses provided by any other Person with whom or which Indemnitee may be associated (including, without limitation, any Sponsor Entity) shall be reduced

by any amount that Indemnitee collects from the Corporation as an indemnification payment or advancement of Expenses pursuant to this Agreement.

(c) The Corporation shall use its best efforts to obtain and maintain in full force and effect an insurance policy or policies providing liability insurance for Representatives of the Corporation or of any other Enterprise, and Indemnitee shall be covered by such policy or policies in accordance with its or their terms to the maximum extent of the coverage available for any such Representative under such policy or policies. If, at the time of the receipt of a notice of a claim pursuant to the terms hereof, the Corporation maintains an insurance policy or policies providing liability insurance for Representatives of the Corporation or of any other Enterprise, the Corporation shall give prompt notice of the commencement of such Proceeding to the insurers in accordance with the procedures set forth in the respective policy or policies. The Corporation shall thereafter take all necessary or desirable action to cause such insurers to pay, on behalf of Indemnitee, all amounts payable as a result of such Proceeding in accordance with the terms of such policies. In the event of a Change in Control or the Corporation's becoming insolvent, the Corporation shall maintain in force any and all insurance policies then maintained by the Corporation in providing insurance (directors' and officers' liability, fiduciary, employment practices or otherwise) in respect of Indemnitee for a period of six years thereafter.

(d) In the event of any payment under this Agreement, the Corporation shall not be subrogated to, and hereby waives any rights to be subrogated to, any rights of recovery of Indemnitee, including, without limitation, rights of indemnification provided to Indemnitee from any other Person or entity with whom Indemnitee may be associated (including, without limitation, any Sponsor Entity) as well as any rights to contribution that might otherwise exist; provided, however, that the Corporation shall be subrogated to the extent of any such payment of all rights of recovery of Indemnitee under insurance policies of the Corporation or any of its subsidiaries, and the Indemnitee shall execute all papers required and take all action necessary to secure such rights, including execution of such documents as are necessary to enable the Corporation to brings suit to enforce such rights.

(e) The indemnification and contribution provided for in this Agreement will remain in full force and effect regardless of any investigation made by or on behalf of Indemnitee.

Section 15. Duration of Agreement; Not Employment Contract. This Agreement shall continue until and terminate upon the latest of: (a) ten (10) years after the date that Indemnitee shall have ceased to serve as a Representative of the Corporation or any other Enterprise and (b) one (1) year after the final termination of any Proceeding then pending in respect of which Indemnitee is granted rights of indemnification or advancement of Expenses hereunder and of any proceeding commenced by Indemnitee pursuant to Section 13 of this Agreement relating thereto. This Agreement shall be binding upon the Corporation and its successors and assigns and shall inure to the benefit of Indemnitee and Indemnitee's heirs, executors and administrators. The Corporation shall require and cause any direct or indirect successor (whether by purchase, merger, consolidation or otherwise) to all or substantially all of the business or assets of the Corporation, by written agreement, expressly or to assume and agree to perform this agreement in the same manner and to the same extent that the Corporation would be required to perform if no such succession had taken place. This Agreement shall not be deemed an employment contract between the Corporation (or any of its subsidiaries or any Enterprise) and Indemnitee. Indemnitee specifically acknowledges that Indemnitee's employment with the Corporation (or any of its subsidiaries or any Enterprise), if any, is at will, and Indemnitee may be discharged at any time for any reason, with or without cause, except as may be otherwise provided in any written employment contract between Indemnitee and the Corporation (or any of its subsidiaries or any Enterprise), other applicable formal severance policies duly adopted by the Board, or, with respect to service as a Representative of the Corporation, by the Certificate of Incorporation, Bylaws and the DGCL.

Section 16. Severability. If any provision or provisions of this Agreement shall be held to be invalid, illegal or unenforceable for any reason whatsoever: (a) the validity, legality and enforceability of the remaining provisions of this Agreement (including, without limitation, each portion of any Section of this Agreement containing any such provision held to be invalid, illegal or unenforceable, that is not itself invalid, illegal or unenforceable) shall not in any way be affected or impaired thereby and shall remain enforceable to the fullest extent

permitted by law; (b) such provision or provisions shall be deemed reformed to the extent necessary to conform to applicable law and to give the maximum effect to the intent of the parties hereto; and (c) to the fullest extent possible, the provisions of this Agreement (including, without limitation, each portion of any Section of this Agreement containing any such provision held to be invalid, illegal or unenforceable, that is not itself invalid, illegal or unenforceable) shall be construed so as to give effect to the intent manifested thereby.

Section 17. Enforcement.

(a) The Corporation expressly confirms and agrees that it has entered into this Agreement and assumed the obligations imposed on it hereby in order to induce Indemnitee to serve as a Representative of the Corporation, and the Corporation acknowledges that Indemnitee is relying upon this Agreement in serving or continuing to serve as a Representative of the Corporation.

(b) This Agreement constitutes the entire agreement between the parties hereto with respect to the subject matter hereof and supersedes all prior agreements and understandings, oral, written and implied, between the parties hereto with respect to the subject matter hereof; provided, however, that this Agreement is a supplement to and in furtherance of the Bylaws and applicable law, and shall not be deemed a substitute therefore, nor to diminish or abrogate any rights of Indemnitee thereunder.

(c) The Corporation shall not seek from a court, or agree to, a "bar order" which would have the effect of prohibiting or limiting the Indemnitee's right to receive advancement of expenses under this Agreement.

Section 18. Modification and Waiver. No supplement, modification or amendment of this Agreement shall be binding unless executed in writing by the parties thereto. No waiver of any of the provisions of this Agreement shall be deemed or shall constitute a waiver of any other provisions of this Agreement nor shall any waiver constitute a continuing waiver. The failure of any party to enforce any of the provisions of this Agreement shall in no way be construed as a waiver of such provisions and shall not affect the right of such party thereafter to enforce each and every provision of this Agreement in accordance with its terms.

Section 19. Notices. All notices, requests, demands and other communications under this Agreement shall be in writing and shall be deemed to have been duly given if (a) delivered by hand and receipted for by the party to whom said notice or other communication shall have been directed, (b) mailed by certified or registered mail with postage prepaid, on the third business day after the date on which it is so mailed, (c) mailed by reputable overnight courier and receipted for by the party to whom said notice or other communication shall have been directed or (d) sent by facsimile transmission, with receipt of oral confirmation that such transmission has been received:

(a) If to Indemnitee, at the address indicated on the signature page of this Agreement, or such other address as Indemnitee shall provide to the Corporation.

(b) If to the Corporation to:

OptiNose, Inc.
1020 Stony Hill Road, Suite 300
Yardley, Pennsylvania 19067
Attn: Chief Legal Officer
Facsimile: (267) 395-2119

or to any other address as may have been furnished to Indemnitee by the Corporation.

Section 20. Contribution. To the fullest extent permissible under applicable law, if the indemnification provided for in this Agreement is unavailable to Indemnitee for any reason whatsoever, the Corporation, in lieu of indemnifying Indemnitee, shall contribute to the amount incurred by Indemnitee, whether for judgments, fines,

penalties, excise taxes, amounts paid or to be paid in settlement and/or for Expenses, in connection with any claim relating to an indemnifiable event under this Agreement, in such proportion as is deemed fair and reasonable in light of all of the circumstances of the Proceeding in order to reflect (a) the relative benefits received by the Corporation and Indemnitee as a result of the event(s) and/or transaction(s) giving cause to such Proceeding; and/or (b) the relative fault of the Corporation (and its directors, officers, employees and agents) and Indemnitee in connection with such event(s) and/or transaction(s).

Section 21. Applicable Law and Consent to Jurisdiction. This Agreement and the legal relations among the parties shall be governed by, and construed and enforced in accordance with, the laws of the State of Delaware, without regard to its conflict of laws rules. Except with respect to any arbitration commenced by Indemnitee pursuant to Section 13(a), the Corporation and Indemnitee hereby irrevocably and unconditionally (a) agree that any action or proceeding arising out of or in connection with this Agreement shall be brought only in the Delaware Court of Chancery, and not in any other state or federal court in the United States of America or any court in any other country, (b) consent to submit to the exclusive jurisdiction of the Delaware Court of Chancery for purposes of any action or proceeding arising out of or in connection with this Agreement, (c) waive any objection to the laying of venue of any such action or proceeding in the Delaware Court of Chancery and (d) waive, and agree not to plead or to make, any claim that any such action or proceeding brought in the Delaware Court of Chancery has been brought in an improper or inconvenient forum.

Section 22. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall for all purposes be deemed to be an original but all of which together shall constitute one and the same Agreement. Only one such counterpart signed by the party against whom enforceability is sought needs to be produced to evidence the existence of this Agreement. Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

Section 23. Third-Party Beneficiaries. The Sponsor Entities are intended third-party beneficiaries of this Agreement.

Section 24. Miscellaneous. Use of the masculine pronoun shall be deemed to include usage of the feminine pronoun where appropriate. The headings of the paragraphs of this Agreement are inserted for convenience only and shall not be deemed to constitute part of this Agreement or to affect the construction thereof.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have caused this Agreement to be signed as of the day and year first above written.

OPTINOSE, INC.

Name: Ramy Mahmoud
Title: Chief Executive Officer

[Signature Page to Indemnification Agreement]

INDEMNITEE:

[ ]

[Signature Page to Indemnification Agreement]

Schedule to Exhibit 10.1

The following directors and executive officers are parties to an Indemnification Agreement with the Company, each of which are substantially identical in all material respects to the representative Indemnification Agreement filed herewith as Exhibit 10.1 except as to the name of the signatory and the date of each signatory's Indemnification Agreement, which are listed below. The actual Indemnification Agreements are omitted pursuant to Instruction 2 to Item 601 of Regulation S-K.

INDEMNITEE	DATE
Ramy A. Mahmoud, M.D., M.P.H.	October 2, 2017
Michael F. Marino	October 2, 2017
Joseph C. Scodari	October 5, 2017
Wilhelmus Groenhuysen	October 5, 2017
Sandra K. Helton	February 22, 2018
Catherine E. Owen	July 29, 2020
Tomas J. Heyman	December 1, 2020
Eric Bednarski	December 10, 2021
Kyle Dempsey	December 10, 2021
R. John Fletcher	April 26, 2022
Anthony J. Krick	June 2, 2022
Paul Spence Jr.	December 15, 2022

OPTINOSE, INC.

LIST OF SUBSIDIARIES

Name	Jurisdiction of Incorporation	Percent Owned
OptiNose US, Inc.	Delaware	100%
Optinose AS	Norway	100%
Optinose UK, Ltd.	United Kingdom	100%

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

(1) Registration Statement (Form S-8 No. 333-221047) pertaining to the Amended and Restated 2010 Stock Incentive Plan and the 2017 Employee Stock Purchase Plan of OptiNose, Inc.
(2) Registration Statement (Form S-8 No. 333-223617) pertaining to the Amended and Restated 2010 Stock Incentive Plan and the 2017 Employee Stock Purchase Plan of OptiNose, Inc.
(3) Registration Statement (Form S-8 No. 333-230083) pertaining to the Amended and Restated 2010 Stock Incentive Plan and the 2017 Employee Stock Purchase Plan of OptiNose, Inc.
(4) Registration Statement (Form S-8 No. 333-236978) pertaining to the Amended and Restated 2020 Stock Incentive Plan, the Non-Qualified Stock Option Award (Inducement Grant) and the Restricted Stock Unit Award (Inducement Grant) of OptiNose, Inc.
(5) Registration Statement (Form S-8 No. 333-253814) pertaining to the Amended and Restated 2010 Stock inventive Plan, 2017 Employee Stock Purchase Plan and the Non-Qualified Stock Option Awards (Inducement Grant) of Optinose Inc.
(6) Registration Statement (Form S-8 No. 333-263362) pertaining to the Amended and Restated 2010 Stock inventive Plan, 2017 Employee Stock Purchase Plan and the Non-Qualified Stock Option Awards (Inducement Grant) of OptiNose, Inc.
(7) Registration Statement (Form S-3 No. 333-228122) of OptiNose, Inc.
(8) Registration Statement (Form S-3 No. 333-258707) of OptiNose, Inc.

of our report dated March 7, 2022, with respect to the consolidated financial statements of OptiNose, Inc. included in this Annual Report (Form 10-K) for the year ended December 31, 2022.

/s/ Ernst & Young LLP

Philadelphia, Pennsylvania
March 7, 2023

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO SECTION 302 OF THE
SARBANES-OXLEY ACT OF 2002

I, Ramy Mahmoud, certify that:

1. I have reviewed this Annual Report on Form 10-K of OptiNose, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act 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.

Date: March 7, 2023

/s/ Ramy Mahmoud
Ramy Mahmoud
Chief Executive Officer
(Principal Executive Officer)

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Anthony J. Krick, certify that:

1. I have reviewed this Annual Report on Form 10-K of OptiNose, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act 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.

Date: March 7, 2023

/s/ Anthony J. Krick
Chief Accounting Officer
(Principal Financial Officer and Principal Accounting Officer)

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER PURSUANT TO 18 U.S.C SECTION 1350, AS ADOPTED PURSUANTTO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, Peter K. Miller, Chief Executive Officer of OptiNose, 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, 2020 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; 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: March 7, 2023

/s/ Ramy Mahmoud
Ramy Mahmoud
Chief Executive Officer
(Principal Executive Officer)

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER PURSUANT TO U.S.C SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, Keith A. Goldan, Chief Financial Officer of OptiNose, 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, 2022 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; 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: March 7, 2023

/s/ Anthony J. Krick
Anthony J. Krick
Chief Accounting Officer
(Principal Financial Officer and Principal Accounting Officer)