REFINITIV

DELTA REPORT

10-K

PULM - PULMATRIX, INC.

10-K - DECEMBER 31, 2023 COMPARED TO 10-K - DECEMBER 31, 2022

The following comparison report has been automatically generated

TOTAL DELTAS	2288
CHANGES	210
DELETIONS	1077
ADDITIONS	1001

REFINITIV

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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2022 2023

or

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

For the transition period from _____to _____ _____ to _____

Commission file number: 001-36199

PULMATRIX, INC.
(Exact name of registrant as specified in its charter)

Delaware	**46-1821392**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
99 Hayden Avenue, Suite 390	
Lexington 36 Crosby Drive, Suite 100 Bedford, MA	**02421 01730**
(Address of principal executive offices)	**(Zip Code)**

(781)357-2333
Registrant's telephone number, including area code (781) 357-2333
Securities registered pursuant to Section 12(b) of the Exchange Act:

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Common Stock, par value $0.0001 per share	**PULM**	**The NASDAQ Nasdaq Stock Market LLC**

Securities registered pursuant to Section 12(g) of the Exchange 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 Exchange 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	☒
		Emerging growth company	☐

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

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. Yes ☐ No ☒

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

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

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

The aggregate market value of the registrant's voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was last sold, as of June 30, 2022 June 30, 2023, the last business day of registrant's most recently completed second fiscal quarter, was $15,546,729 9,787,896.

As of March 27, 2023 March 25, 2024, the registrant had 3,652,285 shares of common stock, par value $0.0001 per share, issued and outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

None.

PULMATRIX, INC.
TABLE OF CONTENTS

PART I

Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements. All statements other than statements of historical fact contained herein, including statements regarding our business plans or strategies, projected or anticipated benefits or other consequences of our plans or strategies, projected or anticipated benefits from acquisitions to be made by us, or projections involving anticipated revenues, earnings, or other aspects of our operating results, are forward-looking statements. Words such as "anticipates," "assumes," "believes," "can," "could," "estimates," "expects," "forecasts," "guides," "intends," "is confident that," "may," "plans," "seeks," "projects," "targets," and "would," and their opposites and similar expressions, as well as statements in future tense, are intended to identify forward-looking statements. Forward-looking statements should not be read as a guarantee of future performance or results and may not be accurate indications of when such performance or results will actually be achieved. Forward-looking statements are based on information we have when those statements are made or our management's good faith belief as of that time with respect to future events and are subject to risks and uncertainties that could cause actual performance or results to differ materially from those expressed in or suggested by the forward-looking statements. Important factors that could cause such differences include, but are not limited to:

- the impact of the novel coronavirus ("COVID-19") pandemic and its continuing effects on the global economy and on the Company's ongoing and planned clinical trials;
- our history of recurring losses and negative cash flows from operating activities, significant future commitments and the uncertainty regarding the adequacy of our liquidity to pursue or complete our business objectives;
- our inability to carry out research, development and commercialization plans;
- our inability to manufacture our product candidates on a commercial scale on our own or in collaborations with third parties;
- our inability to complete preclinical testing and clinical trials as anticipated;
- our collaborators' inability to successfully carry out their contractual duties;
- termination of certain license agreements;
- our ability to adequately protect and enforce rights to intellectual property, or defend against claims of infringement by others;
- difficulties in obtaining financing on commercially reasonable terms, or at all;
- intense competition in our industry, with competitors having substantially greater financial, technological, research and development, regulatory and clinical, manufacturing, marketing and sales, distribution, personnel and resources than we do;
- entry of new competitors and products and potential technological obsolescence of our products;
- adverse market and economic conditions;
- our ability to maintain compliance with the NASDAQ listing standards of the Nasdaq Capital Market's listing standards; Market ("Nasdaq");
- loss of one or more key executives or scientists; and
- difficulties in securing regulatory approval to market our product candidates.

For a more detailed discussion of these and other risks that may affect our business and that could cause our actual results to differ from those projected in these forward-looking statements, see the risk factors and uncertainties described under the heading "Risk Factors" in Part I, Item 1A of this Annual Report on Form 10-K. The forward-looking statements contained in this Annual Report on Form 10-K are expressly qualified in their entirety by this cautionary statement. We do not undertake any obligation to update any forward-looking statement to reflect events or circumstances after the date on which any such statement is made or to reflect the occurrence of unanticipated events, except as required by law.

Unless otherwise stated, references in this Annual Report on Form 10-K to "us," "we," "our," or "Company" refer to Pulmatrix, Inc., a Delaware corporation, and its subsidiary, Pulmatrix Operating Company, Inc., a Delaware corporation.

"iSPERSE™" is one of our trademarks used in this Annual Report on Form 10-K. Other trademarks appearing in this report are the property of their respective holders. Solely for convenience, these and other trademarks, trade names and service marks referred to in this report appear without the ®, TM and SM symbols, but those references are not intended to indicate, in any way, we or the owners of such trademarks will not assert, to the fullest extent under applicable law, their rights to these trademarks and trade names.

ITEM 1. BUSINESS.

Overview

We are a clinical-stage biotechnology biopharmaceutical company focused on the discovery and development of novel inhaled therapeutic products intended to prevent and treat respiratory and other diseases with significant important unmet medical needs using its our patented iSPERSE™ technology. The Company's Our proprietary product pipeline includes treatments for serious lung diseases, such as allergic bronchopulmonary aspergillosis ("ABPA") and Chronic Obstructive Pulmonary Disease ("COPD"), and central nervous system ("CNS") disorders such as acute migraine. migraine and serious lung diseases such as Chronic Obstructive Pulmonary Disease ("COPD") and allergic bronchopulmonary aspergillosis ("ABPA"). Our product candidates are based on its our proprietary engineered dry powder delivery platform, iSPERSE™, which seeks to improve therapeutic delivery to the lungs by maximizing local concentrations optimizing pharmacokinetics and reducing systemic side effects to improve patient outcomes.

We design and develop inhaled therapeutic products based on our proprietary dry powder delivery technology, iSPERSE™ (inhaled Small Particles Easily Respirable and Emitted), which enables delivery of small or large molecule drugs to the lungs by inhalation for local or systemic applications. The iSPERSE™ powders are engineered to be small, dense particles with highly efficient dispersibility and delivery to airways. iSPERSE™ powders can be used with an array of dry powder inhaler technologies and can be formulated with a broad range of drug substances including small molecules and biologics. We believe the iSPERSE™ dry powder technology offers enhanced drug loading and delivery efficiency that outperforms traditional lactose-blend inhaled dry powder therapies.

We believe the advantages of using the iSPERSE™ technology include reduced total inhaled powder mass, enhanced dosing efficiency, reduced cost of goods, and improved safety and tolerability profiles.

We were incorporated in 2013 as a Delaware corporation.

Business Strategy

Our goal is to develop breakthrough therapeutic products that are safe, convenient, and more effective than the existing therapeutic products for respiratory and other diseases where iSPERSE™ properties are advantageous.

Our current pipeline is aligned to this goal as we develop iSPERSE™-based therapeutic candidates which target the prevention and treatment of a range of diseases, including CNS disorders and pulmonary diseases. These therapeutic candidates include PUR3100 for the treatment of acute migraine, PUR1800 for the treatment of acute exacerbations of chronic obstructive pulmonary disease ("AECOPD"), and PUR1900 for the treatment of ABPA in patients with asthma and in patients with cystic fibrosis ("CF"), PUR3100 for the treatment of acute migraine, and PUR1800 for the treatment of acute exacerbations of chronic obstructive pulmonary disease ("AECOPD"). Each program is enabled by its unique iSPERSE™ formulation designed to achieve specific therapeutic objectives.

We intend to capitalize on our iSPERSE™ technology platform and our expertise in inhaled therapeutics to identify new product candidates for the prevention and treatment of diseases, including those with significant considerable unmet medical needs and to build our product pipeline beyond our existing candidates. In order to advance clinical trials for our therapeutic candidates and leverage the iSPERSE™ platform to enable delivery of partnered compounds, we intend to form strategic alliances with third parties, including pharmaceutical and biotechnology companies or academic or private research institutes.

We expect to continue to incur significant substantial expenses and operating losses for at least the next several years based on our drug development plans. We expect our expenses plans and capital requirements will increase substantially in connection with our ongoing activities, as we:

- *Conduct PUR1900 clinical trials focused on the development of an inhaled antifungal therapy to treat an allergic/hypersensitivity response to fungus in the lungs of patients with asthma and CF*.

  We will continue to direct resources to advance the research and development of PUR1900 for ABPA in patients with asthma and CF. In 2018, we completed a Phase 1 study of PUR1900 in normal healthy volunteers and asthma patients. In 2019, we began a Phase 2 study of PUR1900 with patients with asthma and are suffering from ABPA but stopped the Phase 2 study due to the COVID-19 pandemic and its impact on enrollment. In January 2021, we conducted a Type C meeting with the U.S Food and Drug Administration ("FDA") to discuss our plans for a Phase 2b study. Utilizing the FDA feedback, we advanced PUR1900 into a new Phase 2b efficacy study that includes a sixteen-week dosing regimen with potential registration efficacy endpoints, rather than the four-week dosing regimen in the terminated Phase 2 safety biomarker study. The current Phase 2b study began dosing patients in the first quarter of 2023. The PUR1900 Phase 2b study is anticipated to deliver topline data in mid-2024.

- *Pursue further clinical studies for PUR3100, an orally inhaled dihydroergotamine ("DHE") including a Phase 2 clinical study for the treatment of acute migraine. We received Food and Drug Administration ("FDA") acceptance of our Investigational New Drug Application ("IND") and a "study may proceed" letter in September 2023, positioning PUR3100 as Phase 2-ready for potential financing or partnership discussions.*

We developed PUR3100, an iSPERSE™ formulation of DHE in 2020. We completed good laboratory practice ("GLP") toxicology studies in 2021 and 2022. In 2022, we completed GLP toxicology studies in 2021 and 2022. On September 26, 2022, we announced the completion of patient dosing in a Phase 1 study designed as a double-blinded trial evaluating PUR3100, a novel pulmonary inhaled formulation for the treatment of acute migraine. On January 4, 2023, we announced PUR3100 was safe and all doses had fewer GI side effects compared to assess the safety, tolerability, and pharmacokinetics of three dose levels of single doses of inhaled PUR3100 with intravenous ("IV") DHE. PUR3100 demonstrated a five-minute T_{max} and C_{max} within the targeted therapeutic range for all three doses tested. The Phase 1 study design was a double-dummy, double-blinded trial to assess the safety, tolerability, and pharmacokinetics of three dose levels of single doses of inhaled PUR3100 with IV placebo, as compared to IV DHE (DHE mesylate injection) with inhaled placebo. Twenty-six healthy subjects were enrolled and each of the four groups contained at least six subjects. Oral inhalation of PUR3100 achieved peak exposures in the targeted therapeutic range at all doses and the T_{max} occurred at five minutes after dosing.

On January 4, 2023, we announced the Phase 1 topline results, indicating that PUR3100 was safe and tolerated with fewer gastrointestinal side effects in all doses compared to IV DHE. PUR3100 showed a five-minute T_{max} and C_{max} within the targeted therapeutic range for all three doses tested. The Phase 1 study data was presented at the American Headache Society 65th Annual Meeting in June 2023.

We believe these data are encouraging and suggest that the orally inhaled formulation of DHE, PUR3100, will result

In September 2023, we announced the FDA's acceptance of an IND application for PUR3100 and receipt of a "study may proceed" letter for a Phase 2 clinic protocol where safety and preliminary efficacy of PUR3100 will be investigated in rapid systemic exposure in the therapeutic range, while minimizing the risk of side effects related to exposure leve associated with IV dosing. We believe the PUR3100 formulation of DHE is highly differentiated from other DHE products already approved or in development, can be immediately self-administer and has a pharmacokinetic profile that may potentially advance the treatment of patients with acute migraine.

Based on the rapid systemic exposure in the therapeutic range and the improved side effect profile relative to IV dosing, we believe the PUR3100 formulation of DHE may differentiate from approv DHE products or those in development. If effectiveness is demonstrated, PUR3100 may offer the convenience of being self-administered with a pharmacokinetic profile that may potentially provi rapid onset of action.

- *Continue Pursue partnership or other alternatives to monetize or advance PUR1800, focusing on the development of an orally inhaled kinase inhibitor for treatment of AECOPD.*

  We completed preclinical safety studies for our lead iSPERSE™ formulation in 2018 and advanced our formulation and process development efforts to support clinical testing in stab moderate-severe COPD patients. We completed a Phase 1b safety, tolerability, and pharmacokinetics clinical study of PUR1800 for subjects with stable moderate-severe COPD a received topline data from the Phase 1b clinical study in the first quarter of 2022. We analyzed data from the completed Phase 1b clinical study of PUR1800 for AECOPD and present study results at the American Academy of Allergy, Asthma and Immunology (AAAAI) conference in February 2023. We completed all data analysis to inform a study design for potential Phase 2 efficacy and safety study, treating subjects with AECOPD.

  We completed preclinical safety studies for PUR1800, our iSPERSE™ formulation of RV1162, in 2018 and advanced our formulation and process development efforts to support clinic testing in stable moderate-severe COPD patients. We completed a Phase 1b safety, tolerability, and pharmacokinetics clinical study of PUR1800 for subjects with stable moderate-seve COPD and received topline data from the Phase 1b clinical study in the first quarter of 2022. We analyzed data from the completed Phase 1b clinical study of PUR1800 for AECOPD a presented study results at the American Academy of Allergy, Asthma & Immunology (AAAAI) conference in the first quarter of 2023. The results indicated PUR1800 was safe and we tolerated with no observed safety signals. The topline data, along with the results from chronic toxicology studies, support the continued development of PUR1800 for the treatment AECOPD and other inflammatory respiratory diseases.

  - *Terminate the PUR1900 Phase 2b study and seek to monetize PUR1900 in the United States.*

    On January 8, 2024, in agreement with our partner, Cipla Technologies LLC ("Cipla"), pursuant to the Third Amendment to the Cipla Agreement (each as defined herein), we announc plans to stop patient enrollment at 8 subjects in the Phase 2b study of PUR1900, effective immediately. The decision to stop the study was unrelated to any safety concerns. This stu had been ongoing since the first quarter of 2023. We expect to complete all Phase 2b activities by the third quarter of 2024.
    After the study winddown, Pulmatrix will bear no further financial responsibility for the commercialization and development activities as related to PUR1900 outside the United Stat and will receive 2% royalties on any potential future net sales by Cipla outside the United States. Within the United States, we and Cipla will seek to monetize PUR1900, our inhal iSPERSE™ formulation of the antifungal drug itraconazole for indications where an orally inhaled antifungal may provide a therapeutic benefit or fulfill an unmet medical need.

  - *Capitalize on our proprietary iSPERSE™ technology and our expertise in inhaled therapeutics and particle engineering to identify new product candidates for prevention and treatme of diseases, including those with significant important unmet medical needs.*

    To add additional inhaled therapeutics to our discovery pipeline and facilitate additional discovery collaborations, we are leveraging our iSPERSE™ technology and our managemen expertise in inhaled therapeutics and particle engineering to identify potential product candidates. These potential product candidates are potentially safer and more effective than t current standard of care for prevention and treatment of diseases with significant unmet medical needs.

  To add additional inhaled therapeutics to our development pipeline and facilitate additional collaborations, we are leveraging our iSPERSE™ technology and our management's expertise in inhal therapeutics and particle engineering to identify potential product candidates.

- *Invest in protecting and expanding our intellectual property portfolio and file for additional patents to strengthen our intellectual property rights.*

  The status of our patent portfolio changes frequently in the ordinary course of patent prosecution. As of December 31, 2022, our patent portfolio related to iSPERSE™ includ approximately 137 granted patents, 19 of which are granted US patents, with expiration dates from 2024 to 2037, and approximately 49 additional pending patent applications in the U and other jurisdictions. Our in-licensed portfolio related to kinase inhibitors included approximately 276 granted patents, 32 of which are granted US patents, with expiration dates fro 2029 to 2035, and approximately 26 additional pending patent applications in the US and other jurisdictions. On March 1, 2022, we filed a patent cooperation treaty application th discloses and claims certain formulations and methods of use relevant to our PUR3100 program.

  The status of our patent portfolio changes frequently in the ordinary course of patent prosecution. As of December 31, 2023, our patent portfolio related to iSPERSE™ included approximately 14 granted patents, 19 of which are granted US patents, with expiration dates from 2024 to 2037, and approximately 56 additional pending patent applications in the US and other jurisdictions. Our i licensed portfolio related to kinase inhibitors included approximately 276 granted patents, 33 of which are granted US patents, with expiration dates from 2029 to 2035, and approximately additional pending patent applications in the US and other jurisdictions. We have national phase applications pending in Australia, Brazil, Canada, China, Europe, Israel, India, Japan, Kore Mexico, New Zealand, Russia, and the United States that cover certain formulations and methods of use relevant to our PUR3100 program.

- *Hire personnel Seek partnerships and license agreements to support the product development and commercialization of our product development, commercialization, candidates.*

  In order to advance our clinical programs, we may seek partners or licensees in areas of pharmaceutical and administrative efforts. clinical development.

During 2022, we were staffed to support two active clinical programs. In first quarter of 2022, we hired our Chief Medical Officer, among other personnel, to support these programs.

iSPERSE™ Technology

We use simple, safe excipients, including proprietary cationic salt formulations, to create a robust and flexible dry powder platform technology that can accommodate a wide range of drug loads highly dispersible particles. Our initial delivery platform emerged from development of iCALM™ iCALM™ (inhaled Cationic Airway Lining Modulators), a non-steroidal anti-inflammatory therap The high degree of aerosol efficiency and the density profile of our dry powder iCALM™ iCALM™ formulations provided the foundation for our development of iSPERSE™ in 2012, which uses oth monovalent and divalent salts.

iSPERSE™ particles are engineered with a small, dense and dispersible profile to exceed the performance of traditional dry powder particles as the iSPERSE™ particles have the dispersibil advantages of porous engineered particles. We believe this results in superior drug delivery compared to traditional oral and injectable forms of treatment for certain diseases. Unlike lactose-blend carrier formulations or low-density particles which disperse poorly, we believe that the iSPERSE™ technology platform offers several potential benefits, achieved through the following technologic innovations:

- *Flexible drug loading for delivery of a single microgram to tens of milligrams per dose.*

  iSPERSE™ particles can be engineered to include significantly concentrations from less than one percent (1%) to greater than eighty percent (80%) active pharmaceutical ingredien ("APIs"), which allows flexibility for dosing both high potency and high-drug load therapeutics.

- *Superior flow rate independent lung delivery without carriers.*

  The iSPERSE™ technology enables pulmonary delivery independent of lactose or other carriers, which results in significantly greater lung dose at a matched nominal dose of conventior lactose-based formulations. iSPERSE™ formulations are dispersible across a range of flow rates with consistent emitted dose and particle size. Performance across flow rates provid reliable dose delivery across patient populations and reduces patient-to-patient variability.

- *Delivery of macromolecules and biologics.*

  iSPERSE™ powders can be used with an array of dry powder inhaler technologies and can be formulated with a broad range of therapeutic compounds ranging from small molecules proteins for both local and systemic drug delivery applications.

- *Homogenous combinations of multiple drugs.*

  iSPERSE™ creates homogenous particles including excipients and API, which allow for the consistent delivery of multiple APIs in a product. We have successfully formulat iSPERSE™-based products with dual and triple API combinations.

- *Strong safety profile.*

  Current iSPERSE™ products and planned clinical-stage products to be formulated in iSPERSE™ are supported by robust preclinical safety profiles. iSPERSE™ excipients include tho with inhalation precedent and those that are generally regarded as safe by other routes of administration.

Therapeutic Candidates

PUR1900

We are developing an iSPERSE™ inhaled formulation of the antifungal drug itraconazole for the prevention and treatment of fungal infections and allergic/hypersensitivity reactions to fungus patients with severe lung disease, including those with asthma and CF. On January 28, 2020, PUR1900 received Fast Track designation from the FDA for the treatment of ABPA. *Aspergill* colonization and infections are likely underdiagnosed and occur frequently in patients of all ages. Colonization and infection with *Aspergillus*. can lead to clinical disease with differing severities a complications depending on the immune status of the host. Invasive aspergillosis is a frequently fatal disease that occurs in patients that are typically immune suppressed as a result of treatment f hematologic cancers or immunosuppression prior to solid organ transplantation. In patients with asthma and CF, *Aspergillus* can cause chronic infections that may be associated with worsening disea and larger declines in lung function than patients without infection. A subset of patients with asthma and CF with *Aspergillus* colonization and/or infection develop ABPA, which is a compl hypersensitivity reaction to fungal antigens. ABPA is a disease resulting in mucus production, wheezing, pulmonary infiltrates, worsening bronchiectasis, and fibrosis of the lung.

In patients with both asthma and CF, ABPA is commonly treated with oral steroids to treat inflammation and with oral antifungals to reduce fungal infection. The inhalation administration of a dr affords direct delivery of the drug to the infected parts of the lung, maximizing the dose to the affected sites and minimizing systemic exposure to the rest of the body where it could cause significa side effects. Therefore, treatment of lung infections by direct administration of anti-infective products to the lung may improve both the safety and efficacy of treatment compared to system administration by other routes, as well as improving patient convenience as compared to oral and injectable forms of the treatment. We believe that local lung delivery by inhalation of our iSPERSE formulation could provide convenient, effective and safe management of the debilitating and often life-threatening lung infections that are not currently addressed by inhaled therapies.

PUR1900 is our inhaled formulation of itraconazole, an antifungal drug commercially available as an oral drug that we are developing to treat and prevent pulmonary fungal infections. Development PUR1900 is focused on treatment of *Aspergillus*. colonization and infection in patients with asthma and CF. In a Phase 1/1b clinical trial, PUR1900 appeared to be safe and well tolerated in healt normal volunteers (Parts 1 and 2) and in patients with asthma (Part 3). In Part 3 of the Phase 1/1b clinical study, following a single dose of PUR1900, the pharmacokinetics ("PK") analysis of sputu samples demonstrated approximately 70-fold higher maximum lung concentration of itraconazole following inhalation of PUR1900 compared to oral Sporanox® (Janssen Pharmaceuticals) desp inhaling only one-tenth the dose of itraconazole (20 mg) relative to the dose of oral Sporanox® (200 mg). Lung exposure, as measured by sputum induction and analysis, was approximately 50-fo higher and plasma exposure was approximately 85-fold lower following inhalation of 20 mg of PUR1900 compared to 200 mg of oral Sporanox®. All endpoints from the Phase 1/1b clinical study we successfully met.

On April 15, 2019, we entered into a Development and Commercialization Agreement (the "Cipla Agreement") with Cipla Technologies LLC ("Cipla") for the co-development and commercializatio on a worldwide, except for the Cipla Territory defined below, exclusive basis, of PUR1900, our inhaled iSPERSE™ drug delivery system (the "Product") enabled formulation of the antifungal dru itraconazole, which is only available as an oral drug, for the treatment of all pulmonary indications, including ABPA in patients with asthma. We entered into an amendment to the Cipla Agreement November 8, 2021 (the "Amendment"), and all references to the Cipla Agreement herein refer to the Agreement as amended.

The Cipla Agreement will remain in effect in perpetuity, unless otherwise earlier terminated in accordance with its terms. In the event of circumstances affecting the continuity of development of t Product in line with the Cipla Agreement or certain development milestones are not achieved within a specified timeframe discussed in greater detail below, the joint steering committee ("JSC") w evaluate the cause and effect and make a recommendation as to the most optimal option available to Cipla and us. In such events, the parties are not obligated to follow the recommendation of the JS and, either party may elect to terminate (a "Terminating Party") its obligation to fund additional costs and expenses for the development and/or commercialization of the Product. If the non-Terminati Party wishes to continue the development of the Product, it will have the right to purchase the rights of the Terminating Party in the Product at its fair market value. If both Cipla and we abandon t development program, Cipla and we shall make commercially reasonable efforts to monetize the Product and development program in connection with the Pulmonary indications. Cipla and we w equally share the proceeds.

We and Cipla will each be responsible for 60% and 40%, respectively, of our overhead costs and the time spent by our employees and consultants on development of the Product ("Direct Costs"), addition to which, Cipla will reimburse us an amount equal to 10% of aggregate Direct Costs upon the achievement of the development milestones set forth in the table below, potentially bringing t sharing of Direct Costs to a 50/50 basis. We will continue to share all other development costs with Cipla that are not Direct Costs, such as the cost of clinical research organizations, manufacturi costs and other third-party costs, on a 50/50 basis.

Pursuant to the Cipla Agreement, (i) all development and commercialization activities with respect to the Product in India, South Africa, Sri Lanka, Nepal, Iran, Yemen, Myanmar and Algeria (su countries, the "Cipla Territory") will be conducted exclusively by Cipla at Cipla's sole cost and expense, and (ii) Cipla shall be entitled to all profits from the sale of the Product in the Cipla Territo except that if Cipla successfully transfers manufacturing of the Product for the Cipla Territory to a manufacturing site determined by Cipla, we will become entitled to a royalty equal to 2% of net sal in the Cipla Territory.

In partnership with Cipla, we initiated a Phase 2 clinical study in 2019, entitled: "A Randomized, Double-Blind, Multicenter, Placebo-Controlled, Phase 2 Study to Evaluate the Safety, Tolerability, a Pharmacokinetics of Itraconazole Administered as a Dry Powder for Inhalation (PUR1900) in Adult Asthmatic Patients with ABPA." This clinical study was terminated in July 2020 due to the ongoi impact of the COVID-19 pandemic on patient enrollment and clinical study conduct.

Following termination of the Phase 2 clinical study, we conducted a Type C meeting with the FDA on January 27, 2021, in order to discuss the program overall development plan and the current ongoing Phase 2b clinical study design. The current Phase 2b clinical study design includes a 16-week dosing regimen with an 8-week follow up and is intended to explore potential efficacy endpoin whereas the terminated Phase 2 clinical study had comprised only a 4-week dosing regimen with safety and tolerability as its primary endpoint. The longer dosing regimen of the new Phase 2b clinic study is supported by the 6-month inhalation toxicology study in dogs completed in April 2020. The new development plan, including the new Phase 2b clinical study, was approved by the partnersh JSC on November 8, 2021. On February 6, 2023, we announced the first patient dosed in the Phase 2b study and the study is currently on track with topline data anticipated in mid-2024.

In addition to the terms of the Cipla Agreement described above, if any of the below development milestones are not met by the date that is nine months after the applicable deadline for achieving su development milestone, either party may elect to terminate its obligation to fund additional development costs, in which case either (i) the non-Terminating Party can acquire the rights of t Terminating Party for fair market value or (ii) the parties will monetize the Product. The table below sets forth the development milestones.

Phase 2b Development Plan – Development Milestones

Development Milestone	Milestone Date
25% of patients enrolled in Phase 2b clinical study are dosed	**June 30, 2023**
Company delivers summary of key efficacy and safety data to include FEV_1, IgE, ACQ-6, number of subjects withdrawn, any severe adverse events related to the medication and an overall summary table of adverse events ("Topline Results") to the JSC.	**June 30, 2024**

Phase 3 Development Plan – Development Milestones

Development Milestone	Milestone Date
25% of patients enrolled in Phase 3 clinical study dosed	**To be proposed by JSC**
Company delivers Topline Results to the JSC	**To be proposed by JSC**
The Prescription Drug User Fee Act (the "PDUFA")	**To be proposed by JSC**

Competition and Market Opportunities

Current treatments of pulmonary fungal infections highlight the limitations of oral or intravenous anti-infective treatments for lung infections. Itraconazole is one of the most commonly prescrib therapies for treating *Aspergillus*. infections in patients with asthma and CF. Itraconazole is available commercially as Sporanox® in both a capsule and oral solution form. Itraconazole is metabolized the liver by CYP3A4 and coadministration with a large number of drugs is contraindicated due to the potential for severe drug-drug interactions.

We have demonstrated that PUR1900 achieves higher local lung itraconazole concentrations with lower systemic exposure relative to oral dosing, thus allowing for the potential to improve upon bo the efficacy and safety profiles observed with oral itraconazole. Furthermore, administration by inhalation reduces the exposure of the drug in the rest of the body, which may be beneficial in reduci systemic side effects and the risk of potentially toxic drug-drug interactions.

There is precedent for both dry powder and nebulized inhaled anti-infective therapy to address specific pulmonary infections in patients which demonstrates potential utility of inhaled drug delivery a market opportunity. Mylan currently markets TOBI Podhaler for treatment of *Pseudomonas aeruginosa* infection in the United States and Forest Laboratories U.K. Limited (a subsidiary of Actav PLC) markets inhaled colistin, Colobreathe, for the same infection in Europe. Insmed currently markets Amikacin Liposome Inhalation Suspension (Arikayce) in the United States for the treatment lung disease caused by a group of bacteria, *Mycobacterium avium complex* in a limited population of patients with the disease who do not respond to conventional treatment (refractory disease

Arikayce was the first drug to be approved under the Limited Population Pathway for Antibacterial and Antifungal Drugs, or LPAD pathway, established by Congress under the 21st Century Cures A to advance development and approval of antibacterial and antifungal drugs to treat serious or life-threatening infections in a limited population of patients with unmet need. As required for dru approved under the LPAD pathway, labeling for Arikayce includes certain statements to convey that the drug has been shown to be safe and effective only for use in a limited population. Arikayce w also approved under the accelerated approval pathway. Under this approach, the FDA may approve drugs for serious or life-threatening diseases or conditions where the drug is shown to have an effe on a surrogate endpoint that is reasonably likely to predict a clinical benefit to patients. The approval of Arikayce was based on achieving three consecutive negative monthly sputum cultures by mon six of treatment. Insmed was required by the FDA to conduct an additional, post-market study to describe the clinical benefits of Arikayce. There are currently no products specifically approved f treatment of ABPA, however, there are several inhaled antifungal agents currently under development for the treatment of invasive aspergillosis or ABPA. Treatments under development for invasi aspergillosis include PC945, a novel azole antifungal being developed by Pulmocide as a liquid for nebulization, and a dry powder formulation of voriconazole being developed by TI Pharmaceuticals. In principle, development of an inhaled antifungal for the treatment of invasive aspergillosis could also be effective for ABPA but would require additional clinical studies in the targ patient population. Zambon has also developed a dry powder formulation of voriconazole for the treatment of ABPA and completed a Phase 1 study in the third quarter of 2020. However, no addition development has since been reported. Regeneron Pharmaceuticals is currently running a clinical trial with Dupilumab (NCT04442269) for the treatment of ABPA in asthma. This trial is anticipated run through December 2023 and is focused on prevention of exacerbations in individuals with at one or more severe respiratory exacerbations.

New methods to detect *Aspergillus*. infection in sputum have improved the sensitivity of diagnosis and clinical appreciation for these infections. Pulmonary *Aspergillus*. infections affect approximate 14 million patients worldwide according to the Global Action Fund for Fungal Infections (Improving Outcomes for Patients with Fungal Infections across the World: A Road Map for the Next Decade The majority of these cases occur in patients with asthma who have allergic disease and also include invasive *Aspergillus*. infections that are associated with a high rate of mortality immunocompromised patients. We believe that PUR1900 compares favorably to the products discussed above and has the potential to generate significant value based on treating and preventi pulmonary fungal infections in multiple patient populations.

Clinical Development

We successfully completed a Phase 1/1b clinical study in 2018 which enabled us to initiate a Phase 2 clinical study in 2019, entitled: "A Randomized, Double-Blind, Multicenter, Placebo-Controlle Phase 2 Study to Evaluate the Safety, Tolerability, and Pharmacokinetics of Itraconazole Administered as a Dry Powder for Inhalation (PUR1900) in Adult Asthmatic Patients with ABPA." This clinic study was terminated in July 2020 due to the impact of the COVID-19 pandemic on patient enrollment and clinical study conduct. The completion of a 6-month inhalation toxicology study in dogs 2020 enables the conduct of the current Phase 2b clinical study.

The current Phase 2b study includes a 16-week dosing regimen and exploration of potential regulatory approval endpoints. We dosed the first patient in this current Phase 2b clinical study during t first quarter of 2023 with topline data expected in mid-2024.

This clinical study may be affected by remaining conditions related to the COVID-19 pandemic and its ongoing effects with respect to clinical study conduct and patient enrollment. For mo discussion of risks related to the COVID-19 pandemic and its ongoing effects, please see "Item 1A. RISK FACTORS.—Risks Related to Our Business—*Business interruptions could limit our ability operate our business.*"

PUR3100

In 2020, we began developing developed PUR3100, the iSPERSE™ formulation of DHE, for the treatment of acute migraine. Over 38 million people suffer from migraine in the United State Currently DHE is only available as subcutaneous, intravenous infusion or intranasal delivery. If approved for commercialization, PUR3100 should has the opportunity to be the first orally inhaled DH treatment for acute migraine and be an alternative to other acute therapies, such as oral and intravenous triptans that currently represent the majority of the annual migraine prescriptions in the Unit States. therapies. Given the oral inhaled route of delivery, we believe PUR3100 could is anticipated to provide a relief from the rapid onset of migraine symptom relief with symptoms and provide favorable tolerability profile.

Competition and Market Opportunities

The American Migraine Foundation estimates that at least 39 million people in the United States and 1 billion people worldwide live with migraine, but because many people are not diagnosed or not receive the treatment they need, the actual number may be higher. Current treatments for migraine include oral, intranasal, IV or intramuscular (“IM”) subcutaneous formulations of triptans, DH and calcitonin gene-related peptide (“CGRP”) antagonists. antagonists (gepants). Studies show that people with migraines are underdiagnosed, undertreated, and experience substantial decreases functioning and productivity, which translates into diminished quality of life for individuals, and financial burdens to patients, health-care systems, and employers. All current treatments suffer from a limited by incomplete efficacy and/or tolerability and there exists a significant unmet need intolerability. Therefore, development of additional treatments for safe and effective alternatives to curre treatments. acute migraine is warranted.

DHE has been shown to be effective in the treatment of migraine and, in particular, hard to treat migraines, such as menstrual migraine, migraine upon awakening, and severe migraine. Utilization DHE has been limited due to its poor oral bioavailability, requiring IV, subcutaneous or intranasal dosing. IV dosing generally requires administration in a healthcare setting and the high exposure leve results may result in significant nausea and vomiting and as such vomiting. Hence, its use has generally been limited to use only in patients with intractable or medication-overuse migraine. Intranas dosing with DHE, including Migranal (Bausch Health US LLC), approved in December 1997, has been poorly adopted due to poor exposure resulting in inconsistent efficacy. and Trudhesa (Imp NeuroPharma, Inc.), another nasal spray utilizing DHE, was approved by the FDA in September 2021. 2021, have been poorly adopted due to incomplete efficacy and intolerability of nasal inhalati in patients during a migraine.

There is precedent for an orally inhaled DHE therapy. MAP Pharmaceuticals, Inc. developed MAP0004, also known as Levadex or Semprana, a liquid suspension formulation of DHE, designed to dosed via a pMDI inhalation device. Their published data indicate a safe and well tolerated formulation with rapid onset and long-lasting efficacy that compared favorably to existing treatmen Development of MAP0004 led to a new drug application ("NDA") but was halted after multiple complete response letters from the FDA citing Chemistry, Manufacturing and Controls ("CMC") issu related to dose uniformity and stability issues. Regardless of the failure of MAP0004, the efficacy and tolerability of the formulation reported by MAP Pharmaceuticals provides proof of concept for orally inhaled DHE formulation. PUR3100, the iSPERSE™ formulation planned by Pulmatrix, is anticipated to deliver DHE to the lung with efficacy and tolerability that compares favorably wi MAP0004, while avoiding the device-related issues of MAP0004 by delivering PUR3100 as an iSPERSE™ dry powder.

We believe that an iSPERSE formulation of DHE can provide the positive rapid onset and long-lasting efficacy seen in the MAP0004 data by enabling a similar pharmacokinetic profile wh eliminating the manufacturing and device issues which led to the MAP0004 FDA complete response letters.
To the best of our knowledge, there are no other orally inhaled DHE formulations currently in development. development or on the market. Migranal and Trudhesa are the two currently FDA approv intranasal formulations. formulations of DHE. Satsuma Pharmaceuticals, a subsidiary of Shin Nippon Biomedical Laboratories ("Satsuma"), has developed a dry powder formulation of DHE f intranasal dosing and have has completed two Phase 3 clinical studies (ClinicalTrials.gov (ClinicalTrials.gov: NCT03901482 and NCT04940390). Despite failure of both clinical studies to achie primary endpoints, Satsuma filed an NDA in the first quarter of 2023 based on post-hoc analysis showing benefit in secondary endpoints. Satsuma's NDA filing is pending, and they are active seeking a commercialization partner.
In January 2024, the FDA declined to approve the treatment, citing manufacturing concerns. Satsuma plans to work with the FDA to determine possible paths to resubmit the NDA.

Non-Clinical Development

A total of three 14-day good laboratory practices ("GLP") GLP toxicology studies have been completed with PUR3100 to support single dose single-dose clinical studies. Preparations We are underw for planning to conduct a chronic toxicology study to support long-term dosing and dosing. Based on discussions with the FDA, this would complete the non-clinical requirements to support an eventu NDA.

Clinical Development
We have completed severalOur interactions with the FDA and they have confirmed indicated that, in addition to the Planned planned Phase 2 and Phase 3 studies, long-term safety should be assessed a minimum of one hundred patients for six months of dosing and fifty patients for twelve months of dosing. The FDA also confirmed that it will be necessary to perform a safety study administeri PUR3100 to otherwise healthy patients with asthma before a an NDA is submitted.
On September 26, 2022, we announced the completion of patient dosing in a Phase 1 clinical study, performed in Australia, designed to assess not only safety, tolerability, and pharmacokinetics PUR3100 in humans, but also provide preliminary comparative bioavailability data to support the use of the 505(b)(2) pathway for marketing authorization.
Australia. The study design was a double-dummy, double-blinded trial to assess the safety, tolerability, and pharmacokinetics of three dose levels of single doses of inhaled PUR3100 with IV placeb as compared to IV DHE (DHE mesylate injection) with inhaled placebo. This study may also provide preliminary comparative bioavailability data to support the use of the 505(b)(2) pathway f marketing authorization. Twenty-six healthy subjects were enrolled and each of the four groups contained at least six subjects.

On January 4, 2023, we announced topline results. PUR3100 was well-tolerated and there was a lower incidence of nausea in PUR3100 dose groups compared to IV DHE. No DHE, and we present the Phase 1 study data at the American Headache Society 65th Annual Meeting in June 2023. In contrast to IV DHE, no vomiting was observed in any of the PUR3100 dose groups. Oral inhalation PUR3100 achieved peak exposures in the targeted therapeutic range at all doses and the T_{max} occurred at five minutes after dosing.

We believe these data are encouraging and suggest that Based on the orally inhaled formulation of DHE, PUR3100, will result in rapid systemic exposure in the therapeutic range while minimizing a the risk of improved side effects related effect profile relative to exposure levels associated with IV dosing. We dosing, we believe the PUR3100 formulation of DHE is highly differentiated m differentiate from other approved DHE products already approved or those in development, can be immediately development. If effectiveness is demonstrated, PUR3100 may offer the convenience being self-administered and has with a pharmacokinetic profile that may potentially advance the treatment provide rapid onset of patients with acute migraine. action.

We plan In September 2023, we announced that the FDA accepted the PUR3100 IND and the receipt of a "study may proceed" letter for the clinical study: "A Phase 2, Multicenter, Randomize Double-Blind, Placebo-Controlled, Single Event Study to open an IND Evaluate the Safety, Tolerability, and Efficacy of PUR3100 (Dihydroergotamine Mesylate Inhalation Powder) in the seco quarter Acute Treatment of 2023 in order to conduct a randomized placebo-controlled Phase 2 clinical study in patients with migraine to assess the safety and effectiveness of two doses of PUR3100, which the selection of the two doses has been informed by the initial Phase 1 clinical study. Migraine". We anticipate that this Phase 2 clinical study will initiate once financing or partnersh arrangements have been made.

Clinical study starts may be affected by conditions related to the COVID-19 pandemic and its ongoing effects with respect to clinical study conduct and patient enrollment. For more discussion of ris related to the COVID-19 pandemic, please see "Item 1A. RISK FACTORS—Risks Related to Our Business—*Business interruptions could limit our ability to operate our business*Business"."

PUR1800

Reduced responsiveness to corticosteroids represents an important barrier to effective treatment of COPD and AECOPD and provides a clear rationale to seek novel medicines to treat these respirato diseases. In addition, current treatments generally fail to treat the underlying source of the AECOPD, in particular when a viral or bacterial infection is the cause, which occurs in approximately 80% exacerbations. RV1162, the active ingredient of PUR1800, is a novel, potent anti-inflammatory that inhibits the phosphorylation of a narrow spectrum of kinases. In pre-clinical studies, RV11 demonstrated direct anti-inflammatory activity in a model of viral induced respiratory inflammation. RV1162 also demonstrated a reduction in corticosteroid-resistant inflammatory responses in model of cigarette smoke induced inflammation. These findings suggested that RV1162 has the potential to deliver effective anti-inflammatory outcomes in corticosteroid-resistant patients while al reducing the underlying source of inflammation in an exacerbation, such as a viral and/or bacterial respiratory infection.

Clinical studies conducted by RespiVert/Janssen with RV1162 formulated as a lactose blend for inhalation demonstrated that the molecule was well tolerated for up to 14 days of dosing in patients wi COPD. Analysis of sputum collected from patients with COPD treated with RV1162 showed reduced levels of p38 phosphorylation in sputum cells and decreases in the number of neutroph recovered in sputum after 12 days of dosing. These findings suggest that inhalation of RV1162 may confer anti-inflammatory benefits after a short dosing regimen. Long-term toxicology studies wi RV1162 as a lactose blend suggested that this formulation was not suitable for chronic dosing.

Based upon the clinical results generated by RespiVert/Janssen for RV1162 and the anticipated benefits of an iSPERSE™ formulation of RV1162, we entered into a License, Development a Commercialization Agreement with RespiVert Ltd. ("RespiVert"), a wholly owned subsidiary of Janssen Biotech, Inc. on June 9, 2017. RespiVert granted us an exclusive, royalty-bearing license ir portfolio of narrow spectrum kinase inhibitor compounds ("NSKI"). We subsequently formulated RV1162 into PUR1800 for development as a potential therapy for AECOPD.

We conducted two 28-day GLP toxicology studies in rats and dogs. Results from the two GLP toxicology studies supported the potential for PUR1800 to improve lung exposure, with reduced lu accumulation, as compared to RV1162 as a lactose blend formulation, suggesting potential for chronic dosing.

On December 26, 2019, we entered into a License, Development and Commercialization Agreement (the "JJEI License Agreement") with Johnson & Johnson Enterprise Innovation, Inc. ("JJEI Under the JJEI License Agreement, we granted JJEI an option to acquire (1) the Company's rights to an intellectual property portfolio of materials and technology related to NSKI and (2) an exclusiv worldwide, royalty bearing license to PUR1800. As part of the agreement, Pulmatrix was to complete chronic toxicology studies in rats and dogs, with durations of six and nine months, respective Pulmatrix was also to complete a Phase 1b clinical trial in stable COPD patients. JJEI had the right to execute its option for licensure (option period) any time up to three months following the later (i) receipt of the final report for the clinical study, or (ii) receipt of the audited draft reports for the toxicology study. JJEI terminated the JJEI License Agreement effective July 6, 2021, prior to delive of any data from the ongoing toxicology studies and ongoing Phase1b clinical study.

All rights to the kinase inhibitor portfolio, including PUR1800 and PUR5700, reverted back to us along with all data generated from the ongoing studies predominantly funded through proceeds fro the terminated JJEI License Agreement.
Toxicology studies in rats and dogs, with durations of six and nine months, respectively, were then completed. The data from both studies demonstrated that PUR1800 is safe and well tolerated w chronic dosing, with no progression of findings from 28-day studies. We believe this indicates potential for chronic dosing of PUR1800, enabling us to explore PUR1800 therapy for chronic respirato disease such as steroid resistant asthma, COPD, or idiopathic pulmonary fibrosis. While the program is currently in development for treatment of AECOPD, these positive toxicology study results cou expand potential indications and value of the program.

Competition and Market Opportunities

There are 18 million moderate-to-severe episodes of AECOPD in the U.S. each year. AECOPD are sudden onset increases in symptoms, including increased dyspnea, sputum purulence and volum and wheezing, coughing, and shortness of breath that require medical intervention and can lead to hospitalization. The occurrence of an exacerbation greatly increases the likelihood of a furth exacerbation within the following 6 months and creates a significant financial burden to healthcare systems.

Steroids are standard of care for moderate-to-severe acute exacerbations, which occur across all patient severity types. We believe a significant substantial unmet need exists in AECOPD for tho patients with underlying infection and/or steroid resistance. Acumapimod (BCT-197) is an oral p38 MAP kinase inhibitor being developed by Mereo BioPharma. BCT-197 completed Phase development as first-line therapy for severe AECOPD. In April 2019, Mereo BioPharma announced completion of an end of Phase 2 meeting with the FDA and stated the company is continui discussions with potential partners for BCT-197. We are not aware of any further progress in either clinical development or partnership efforts on this product. A generic version of roflumilast, phosphodiesterase inhibitor approved by the FDA for use in managing COPD exacerbations, became available in 2022.

Non-Clinical Development

We conducted two 28-day GLP toxicology studies in rats and dogs. Results from the two GLP toxicology studies supported the potential for PUR1800 to improve lung exposure, with reduced lu accumulation, as compared to RV1162 as a lactose blend formulation, suggesting potential for chronic dosing.

Toxicology studies in rats and dogs, with durations of six and nine months, respectively, were then completed. The data from both studies demonstrated that PUR1800 is safe and well tolerated w chronic dosing, with no progression of findings from 28-day studies. We believe this indicates potential for chronic dosing of PUR1800, within the safety margin identified, enabling us to explo PUR1800 therapy for chronic respiratory diseases such as steroid resistant asthma, COPD, or idiopathic pulmonary fibrosis. While the program is currently in development for treatment of AECOP these positive toxicology study results could expand potential indications and value of the program.

Clinical Development

The clinical study, performed at the Medicines Evaluation Unit in Manchester, UK, was a randomized, three-way crossover double-blind study with 14 days of daily dosing which includes placebo a one of two doses of PUR1800, and included a 28 day follow up period after each treatment period. A total of 18 adults with stable COPD were enrolled. Safety and tolerability, as well as systemic P were evaluated.

We completed the a Phase 1b safety, tolerability, and pharmacokinetics of PUR1800 for patients with stable moderate-severe COPD. Topline data was delivered in the first quarter of 2022 and present at the American Academy of Allergy, Asthma and Immunology conference in the first quarter of 2023.

The clinical study, performed at the Medicines Evaluation Unit in Manchester, UK, was a randomized, three-way crossover double-blind study with 14 days of daily dosing which includes placebo a one of two doses of PUR1800, and included a 28-day follow-up period after each treatment period. A total of 18 adults with stable COPD were enrolled. Safety and tolerability, as well as systemic P were evaluated.

PUR1800 was well tolerated and there were no observed safety signals. The PK data indicate that PUR1800 results in low and consistent systemic exposure when administered via oral inhalation. T topline data, along with the results from chronic toxicology studies, support the continued development of PUR1800 for the treatment of AECOPD and other inflammatory respiratory disease. disease These data will inform the design of a potential Phase 2 study in the treatment of AECOPD.

PUR1900

PUR1900 is our iSPERSE™ inhaled formulation of itraconazole, an antifungal drug commercially available as an oral drug. We developed PUR1900 for the prevention and treatment of fung infections and allergic/hypersensitivity reactions to fungus in patients with severe lung disease, including those with asthma and CF. On January 28, 2020, PUR1900 received Fast Track designati from the FDA for the treatment of ABPA. *Aspergillus* colonization and infections are likely underdiagnosed and occur frequently in patients of all ages. Colonization and infection with *Aspergillus* c lead to clinical disease with differing severities and complications depending on the immune status of the host. Invasive aspergillosis is a frequently fatal disease that occurs in patients that are typical immune suppressed as a result of treatment for hematologic cancers or immunosuppression prior to solid organ transplantation. In patients with asthma and CF, *Aspergillus* can cause chronic infectio that may be associated with worsening disease and larger declines in lung function than patients without infection. A subset of patients with asthma and CF with *Aspergillus* colonization and/ infection develop ABPA, which is a complex hypersensitivity reaction to fungal antigens. ABPA is a disease resulting in mucus production, wheezing, pulmonary infiltrates, worsening bronchiectas and fibrosis of the lung.

In patients with both asthma and CF, ABPA is commonly treated with oral steroids to treat inflammation and with oral antifungals to reduce fungal infection. The inhalation administration of a dr affords direct delivery of the drug to the infected parts of the lung, maximizing the dose to the affected sites and minimizing systemic exposure to the rest of the body where it could cause dose-limiti side effects. Therefore, treatment of lung infections by direct administration of anti-infective products to the lung may improve both the safety and efficacy of treatment compared to system administration by other routes, as well as improving patient convenience as compared to oral and injectable forms of the treatment. We believe that local lung delivery by inhalation of our iSPERSE formulation could provide convenient, effective and safe management of the debilitating and often life-threatening lung infections that are not currently addressed by inhaled therapies.

Competition and Market Opportunities

Current treatments of pulmonary fungal infections highlight the limitations of oral or intravenous anti-infective treatments for lung infections. Itraconazole is one of the most commonly prescrib therapies for treating *Aspergillus* infections in patients with asthma and CF. Itraconazole is available commercially as Sporanox® in both a capsule and oral solution form. Itraconazole is metabolized the liver by CYP3A4 and coadministration with a large number of drugs is contraindicated due to the potential for severe drug-drug interactions.

We have demonstrated that PUR1900 achieves higher local lung itraconazole concentrations with lower systemic exposure relative to oral dosing, thus allowing for the potential to improve upon bo the efficacy and safety profiles observed with oral itraconazole. Furthermore, administration by inhalation reduces the exposure of the drug in the rest of the body, which may be beneficial in reduci systemic side effects and the risk of potentially toxic drug-drug interactions.

There is precedent for both dry powder and nebulized inhaled anti-infective therapy to address specific pulmonary infections in patients which demonstrates potential utility of inhaled drug delivery a market opportunity. Mylan currently markets TOBI Podhaler for treatment of *Pseudomonas aeruginosa* infection in the United States and Teva markets inhaled colistin, Colobreathe, for the sar infection in Europe. Insmed currently markets Amikacin Liposome Inhalation Suspension (Arikayce) in the United States for the treatment of lung disease caused by a group of bacter *Mycobacterium avium complex* in a limited population of patients with the disease who do not respond to conventional treatment (refractory disease). There are currently no products specifica approved for treatment of ABPA, however, there are several inhaled antifungal agents currently under development for the treatment of invasive aspergillosis or ABPA. Treatments under developme for invasive aspergillosis include PC945, a novel azole antifungal being developed by Pulmocide as a liquid for nebulization, and a dry powder formulation of voriconazole being developed by TI Pharmaceuticals. In principle, development of an orally inhaled antifungal for the treatment of invasive aspergillosis could also be effective for ABPA but would require additional clinical studies in t target patient population. Zambon has also developed a dry powder formulation of voriconazole for the treatment of ABPA and completed a Phase 1 study in the third quarter of 2020. However, additional development has since been reported. Regeneron Pharmaceuticals is currently running a clinical trial with Dupilumab (NCT04442269) for the treatment of ABPA in asthma. This trial, whi is focused on prevention of exacerbations in individuals with at least one or more severe respiratory exacerbations, completed in February 2024 and is pending results.

New methods to detect *Aspergillus* infection in sputum have improved the sensitivity of diagnosis and clinical appreciation for these infections. Pulmonary *Aspergillus* infections affect approximate 14 million patients worldwide according to the Global Action Fund for Fungal Infections (Improving Outcomes for Patients with Fungal Infections across the World: A Road Map for the Next Decad The majority of these cases occur in patients with asthma who have allergic disease and also include invasive *Aspergillus* infections that are associated with a high rate of mortality immunocompromised patients. We believe that PUR1900 compares favorably to the products discussed above and has the potential to generate substantial value based on treating and preventi pulmonary fungal infections in multiple patient populations.

Clinical Development

We completed a Phase 1/1b clinical study in 2018, wherein PUR1900 appeared to be safe and well tolerated in healthy normal volunteers (Parts 1 and 2) and in patients with asthma (Part 3). In Part 3 the Phase 1/1b clinical study, following a single dose of PUR1900, the pharmacokinetics ("PK") analysis of sputum samples demonstrated approximately 70-fold higher maximum lung concentration itraconazole following inhalation of PUR1900 compared to oral Sporanox® (Janssen Pharmaceuticals) despite inhaling only one-tenth the dose of itraconazole (20 mg) relative to the dose of or Sporanox® (200 mg). Lung exposure, as measured by sputum induction and analysis, was approximately 50-fold higher and plasma exposure was approximately 85-fold lower following inhalation 20 mg of PUR1900 compared to 200 mg of oral Sporanox®**.** All endpoints from the Phase 1/1b clinical study were successfully met.

Successful completion of the Phase 1/1b clinical study enabled us to initiate a Phase 2 clinical study in 2019, entitled: "A Randomized, Double-Blind, Multicenter, Placebo-Controlled, Phase 2 Study Evaluate the Safety, Tolerability, and Pharmacokinetics of Itraconazole Administered as a Dry Powder for Inhalation (PUR1900) in Adult Asthmatic Patients with ABPA." This clinical study w terminated in July 2020 due to the impact of the COVID-19 pandemic on patient enrollment and clinical study conduct. The completion of a 6-month inhalation toxicology study in dogs in 20 enabled the conduct of a new Phase 2b clinical study.

The new Phase 2b study included a 16-week dosing regimen and exploration of potential regulatory approval endpoints. We dosed the first patient during the first quarter of 2023. In January 202 pursuant to the Third Amendment (as defined herein), we announced plans to stop patient enrollment at 8 subjects in this study, effective immediately, and to terminate the study as soon as reasonab possible between the date of the Third Amendment and July 30, 2024.

Our partner Cipla plans to continue clinical development outside the United States and is currently conducting a Phase 2 study in India. Should Cipla successfully market PUR1900 outside the Unit States, Pulmatrix will receive 2% royalties on any potential future net sales by Cipla outside the United States. Within the United States, we and Cipla will seek to monetize PUR1900 for indicatio where an orally inhaled antifungal may provide a therapeutic benefit or fulfill an unmet medical need.

Business Development

PUR3100

In September 2023, we announced the FDA's acceptance of an IND application for PUR3100 and receipt of a "study may proceed" letter for a Phase 2 study. The IND includes a Phase 2 clinic protocol where safety and preliminary efficacy of PUR3100 will be investigated in patients with acute migraine.

PUR1800

We completed a Phase 1b safety, tolerability, and pharmacokinetics clinical study of PUR1800 for subjects with stable moderate-severe COPD and received topline data from the Phase 1b clinical stu in the first quarter of 2022. We analyzed data from the completed Phase 1b clinical study of PUR1800 for AECOPD and presented study results at the American Academy of Allergy, Asthma Immunology (AAAAI) conference in the first quarter of 2023. The results indicated PUR1800 was safe and well tolerated with no observed safety signals. The topline data, along with the results fr chronic toxicology studies, support the continued development of PUR1800 for the treatment of AECOPD and other inflammatory respiratory diseases.

PUR1900

On April 15, 2019, we entered into the Cipla a Development and Commercialization Agreement (the "Cipla Agreement") with Cipla for the co-development and commercialization, on a worldwi exclusive basis, except for the Cipla Territory defined below, exclusive basis, of PUR1900, our inhaled iSPERSE™ drug delivery system (the "Product") enabled formulation of the antifungal dr itraconazole, which is only available as an oral drug, for the treatment of all pulmonary indications, including ABPA in patients with asthma. We entered into an amendment to the Amendment Cip Agreement on November 8, 2021 (the "Second Amendment") and a subsequent amendment on January 6, 2024 (the "Third Amendment").

All references to the Cipla Agreement herein refer to the Cipla Agreement, as amended. The Cipla Agreement will remain in effect in perpetuity, unless otherwise earlier terminated in accordance wi its terms. In the event of circumstances affecting the continuity of development of the Product in line with the Cipla Agreement or certain development milestones are not achieved within a specifi timeframe discussed in greater detail below, the JSC will evaluate the cause and effect and make a recommendation as to the most optimal option available to Cipla and us. In such events, the parti are not obligated to follow the recommendation of the JSC and, either Terminating Party may elect to terminate its obligation to fund additional costs and expenses for the development and/ commercialization of the Product. If the non-Terminating Party wishes to continue the development of the Product, it will have the right to purchase the rights of the Terminating Party in the Product its fair market value. If both Cipla and we abandon the development program, Cipla and we shall make commercially reasonable efforts to monetize the Product and development program in connecti with the Pulmonary indications. Cipla and we will equally share the proceeds.

We and Cipla will each be responsible for 60% and 40%, respectively, of the Direct Costs, in addition to which, Cipla will reimburse us an amount equal to 10% of aggregate Direct Costs upon t achievement of the development milestones set forth in the table below, potentially bringing the sharing of Direct Costs to a 50/50 basis. We will continue to share all other development costs wi Cipla that are not Direct Costs, such as the cost of clinical research organizations, manufacturing costs and other third-party costs, on a 50/50 basis. Additionally, upon commercialization, Cipla and t Company will share equally, both positive and negative total free cash-flows earned by Cipla in respect of the Product.

Pursuant to the Cipla Agreement, (i) Third Amendment, all development and commercialization activities with respect to the Product in all markets other than the Cipla Territory United States (t "Cipla Territory") will be conducted exclusively by Cipla at Cipla's sole cost and expense, and (ii) Cipla shall be entitled to all profits from the sale of the Product in the Cipla Territory, except that Cipla successfully transfers manufacturing of the Product for the Cipla Territory to a manufacturing site determined by Cipla, we will become entitled to a royalty equal to 2% of net sales in the Cip Territory.

In partnership We and Cipla are each responsible for 60% and 40%, respectively, of our overhead costs and the time spent by our employees and consultants on development of the Product ("Dire Costs"). We will share all other development costs with Cipla we initiated a Phase 2 clinical study in 2019, entitled: "A Randomized, Double-Blind, Multicenter, Placebo-Controlled, Phase 2 Study Evaluate the Safety, Tolerability, and Pharmacokinetics of Itraconazole Administered as a Dry Powder for Inhalation (PUR1900) in Adult Asthmatic Patients with ABPA." This clinical study w terminated in July 2020 due to the ongoing impact of the COVID-19 pandemic on patient enrollment and clinical study conduct.

Following termination of the Phase 2 clinical study, we conducted a Type C meeting with the FDA on January 27, 2021, in order to discuss the program overall development plan and the current Pha 2b clinical study design. The currently ongoing Phase 2b clinical study design includes a 16-week dosing regimen with an 8-week follow up and is intended to explore potential efficacy endpoin whereas the terminated Phase 2 clinical study had comprised only a 4-week dosing regimen with safety and tolerability as its primary endpoint. The longer dosing regimen of the new Phase 2b clinic study is supported by the 6-month inhalation toxicology study in dogs completed in April 2020. The new development plan, including the planned current Phase 2b clinical study, was approved November 8, 2021.

In addition to the terms of the Cipla Agreement described above, if any of the below development milestones that are not met by the date that is nine months after the applicable deadline for achievi such development milestone, either party may elect to terminate its obligation to fund additional development costs, in which case either (i) the non-Terminating Party can acquire the rights of t Terminating Party for fair market value or (ii) the parties will monetize the Product. The table below sets forth the development milestones.

Phase 2b Development Plan – Development Milestones

Development Milestone	Milestone Date
25% of patients enrolled in Phase 2b clinical study are dosed	**June 30, 2023**
Company delivers summary of key efficacy and safety data to include FEV_1, IgE, ACQ-6, number of subjects withdrawn, any severe adverse events related to the medication and an overall summary table of adverse events ("Topline Results") to the JSC.	**June 30, 2024**

Phase 3 Development Plan – Development Milestones

Development Milestone	Milestone Date
25% of patients enrolled in Phase 3 clinical study dosed	**To be proposed by JSC**
Company delivers Topline Results to the JSC	**To be proposed by JSC**
The PDUFA	**To be proposed by JSC**

PUR3100

In 2020, we began developing PUR3100, the iSPERSE™ formulation of DHE, for the treatment of acute migraine. Over 38 million people suffer from migraine in the United States. Currently DHE only available as intravenous infusion or intranasal delivery. If approved for commercialization, PUR3100 should be the first orally inhaled DHE treatment for acute migraine and be an alternative other acute therapies, Direct Costs, such as oral the cost of clinical research organizations, manufacturing costs and intravenous triptans that currently represent the majority of the annual migrai prescriptions in the United States. Given the oral inhaled route of delivery, we believe PUR3100 could provide other third-party costs, on a rapid onset of migraine symptom relief with a favorab tolerability profile.

We plan to open an IND in the second quarter of 2023 in order to conduct a randomized placebo-controlled Phase 2 clinical study in patients with migraine to assess the safety and effectiveness of tw doses of PUR3100. We anticipate that this Phase 2 clinical study will initiate once financing or partnership arrangements have been made. We are currently exploring such arrangements.

50/50 basis.

PUR1800

Pursuant to the Third Amendment, we and Cipla agreed to stop patient enrollment at 8 subjects in the ongoing Phase 2b clinical study. During the period commencing on January 6, 2024 and endi July 30, 2024 (the "Wind Down Period"), we will complete all Phase 2b activities, assign or license all patents to Cipla and their registration with the appropriate authorities in the Cipla Territo complete a physical and demonstrable technology transfer and secure all data from the Phase 2b study for inclusion in the safety database for the Cipla Territory. We entered into will share costs wi Cipla during the Wind Down Period in the same proportions discussed above, but subject to a License, Development and Commercialization Agreement with RespiVert on June 9, 2017. RespiV granted us an exclusive, royalty-bearing license in a portfolio of NSKI. We subsequently formulated RV1162 into PUR1800 for development maximum reimbursement amount by Cipla as a potent therapy for AECOPD. approved by the joint steering committee.

After the conclusion of the Wind Down Period, Pulmatrix will bear no further financial responsibility for the commercialization and development with respect to the Product in the Cipla Territory, wi such commercialization and development expenses of the Product in the Cipla Territory to be borne at Cipla's sole cost and expense after January 6, 2024. We conducted two 28-day GLP toxicolo studies in rats and dogs. Results from will receive 2% royalties on any potential future net sales by Cipla outside the two GLP toxicology studies, supported the potential for PUR1800 to result improved lung exposure with reduced lung accumulation as compared to RV1162 as a lactose blend formulation, suggesting potential for chronic dosing. United States.

Following completion of two 28-day GLP toxicology studies in rats and dogs, on December 26, 2019, we entered into the JJEI License Agreement. Under the JJEI License Agreement, we granted JJ an option to acquire (1) the Company's rights to an intellectual property portfolio of materials and technology related to NSKI and (2) an exclusive, worldwide, royalty bearing license to PUR1800. part of the agreement, Pulmatrix was to complete chronic toxicology studies in rats and dogs, with durations of six and nine months, respectively. Pulmatrix was also to complete a Phase 1b clinical tr in stable COPD patients. JJEI had the right to execute its option for licensure (option period) any time up to three months following the later of (i) receipt of the final report for the clinical study, or (receipt of the audited draft reports for the toxicology study. JJEI terminated the agreement effective July 6, 2021, prior to delivery of any data from the ongoing toxicology studies and ongoing Phase clinical study. All rights to the kinase inhibitor portfolio, including PUR1800 and PUR5700, reverted back to us along with all data generated from the ongoing studies predominantly funded throu proceeds from the terminated agreement.

Intellectual Property

Patents and Patent Applications

We protect our intellectual property by filing and advancing patent applications and maintaining granted patents on our iSPERSE™ platform technology and in-licensed kinase inhibitors, whi includes claims to compositions of matter and methods of use for our PUR1900, PUR3100, PUR1800, PUR1900 and other programs, as well as manufacturing processes, devices and packagi relevant to our iSPERSE™ platform and product candidates.

The status of our patent portfolio changes frequently in the ordinary course of patent prosecution. As of December 31, 2022 December 31, 2023, our patent portfolio related to iSPERSE™ includ approximately 137 143 granted patents, 19 of which are granted US patents, with expiration dates from 2024 to 2037, and approximately 49 56 additional pending patent applications in the US a other jurisdictions. Our in-licensed portfolio related to kinase inhibitors included approximately 276 granted patents, 32 33 of which are granted US patents, with expiration dates from 2029 to 203 and approximately 26 22 additional pending patent applications in the US and other jurisdictions. On March 1, 2022, we filed a patent treaty application We have national phase applications pending Australia, Brazil, Canada, China, Europe, Israel, India, Japan, Korea, Mexico, New Zealand, Russia, and the United States that discloses and claims cover certain formulations and methods of u relevant to our PUR3100 program.

There can be no assurance that the patent applications will be granted. The term of individual patents depends upon the legal term of the patents in the countries in which they are obtained. In mo countries in which we file, the patent term is 20 years from the earliest date of filing a non-provisional patent application. In the United States, the patent term of a patent that covers a FDA-approv drug may also be eligible for patent term extension, which permits patent term restoration as compensation for the patent term lost during the FDA regulatory review process. The length of the pate term extension is related to the length of time the drug is under regulatory review. Patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of produ approval and only one patent applicable to an approved drug may be extended. In the future, if and when our products receive FDA approval, we expect to apply for patent term extensions on pater covering those products. Similar provisions are available in Europe and other foreign jurisdictions to extend the term of a patent that covers an approved drug. We plan to seek patent term extensions extend the patent coverage of any of our products that received regulatory approval in any jurisdiction where these extensions are available. However, there is no guarantee that the applicat authorities, including the FDA in the United States, will agree with our assessment on whether such extensions should be granted, and if granted, the length of such extensions.

The patent positions of biotechnology companies like ours are generally uncertain and involve complex legal, scientific and factual questions. In addition, the coverage claimed in a patent applicati can be significantly reduced before the patent is issued, and its scope can be reinterpreted after issuance. Consequently, we may not obtain or maintain adequate patent protection for any of our produ candidates. We cannot predict whether the patent applications we are currently pursuing will issue as patents in any particular jurisdiction or whether the claims of any issued patents will provi sufficient proprietary protection from competitors. Any patents that we hold may be challenged, circumvented or invalidated by third parties.

Trade Secrets

We also rely on trade secret protection of our confidential and proprietary information, including the iSPERSE™ technology. Although we take steps to protect our proprietary information and tra secrets, including through contractual means with our employees, consultants and others, third parties may independently develop substantially equivalent proprietary information and techniques otherwise gain access to our trade secrets or disclose our technology. Thus, we may not be able to meaningfully protect our trade secrets. It is our policy to require our employees, consultants, outsi scientific collaborators, sponsored researchers and other advisors to execute confidentiality agreements upon the commencement of employment or consulting relationships with us. The confidentiality agreements provide that all confidential information concerning our business or financial affairs developed or made known to the individual during the course of the individua relationship with us must be kept confidential and not disclosed to third parties except in specific circumstances. Our confidentiality agreements with our employees also provide that all inventio conceived by the employee in the course of employment with us or from the employee's use of our confidential information are our exclusive property.

Manufacturing

We do not currently own or operate manufacturing facilities for the production of clinical or commercial quantities of our product candidates. We have small-scale production capabilities and general perform early process development for our product candidates to produce the quantities necessary to conduct preclinical studies of our investigational product candidates. We do not have, and do n currently plan to acquire or develop, the facilities or capabilities to manufacture bulk drug substance or drug product for use in human clinical studies. We rely on contract manufacturing organizatio ("CMOs") and third-party contractors to manufacture drug substance and drug product required for our clinical studies. We expect to continue to rely on CMOs to manufacture drug substances and dr products under the appropriate current Good Manufacturing Practices ("cGMP") conditions to perform clinical studies for the foreseeable future. We also contract with CMOs for the labelir packaging, storage and distribution of investigational drug products. These arrangements allow us to maintain a more flexible infrastructure while focusing our expertise on researching and developi our products.

We expect to continue to rely on contract manufacturers to produce sufficient quantities of our product candidates in accordance with the appropriate cGMPs for the pertinent phase of clinical tria cGMP compliance includes strict adherence to regulations for quality control, quality assurance, and the maintenance of records and documentation. The manufacturing facilities that manufacture o approved drug products, if any are approved in the future, must comply with the FDA's cGMP regulation requirements and have acquired FDA or other regulatory approval for the manufacturing of c commercial products. Our contract manufacturers may also be subject to inspections of facilities by regulatory authorities to ensure compliance with applicable regulations. Contract manufacture often encounter difficulties involving production yields, quality control and quality assurance, as well as shortages of qualified personnel. We have little or no direct control over our manufacture compliance with these regulations and standards. Failure to comply with applicable regulatory requirements may result in fines and civil penalties, suspension of production, suspension or delay product approval, product seizure or recall, or withdrawal of product approval. These actions could have a material impact on the availability of products.

Suppliers

We also rely on third-party contract manufacturers to supply the APIs that are used to formulate our therapeutic candidates. We place purchase orders with different contract manufacturers for the AP required for PUR1900, PUR3100, PUR1800 and PUR1800. PUR1900. We additionally rely on third-party vendors to supply raw materials for our APIs and drug products.

Research and Development

For fiscal years ended December 31, 2022 December 31, 2023 and 2021, 2022, we spent approximately $18.2 million $15.5 million and $15.4 million $18.2 million, respectively, on research a development activities.

Government Regulation

Pharmaceutical companies are subject to extensive regulation by national, state and local agencies, such as the FDA, in the United States and the European Medicines Agency in Europe. T manufacture, distribution, marketing, and sale of pharmaceutical products are subject to government regulation in the United States and various foreign countries. Additionally, in the United States, v must follow rules and regulations established by the FDA requiring the presentation of data indicating that our products are safe and efficacious and are manufactured in accordance with cGM regulations. If we do not comply with applicable requirements, we may be fined, the government may refuse to approve our marketing applications or allow us to manufacture or market its produc and we may be criminally prosecuted. We and our manufacturers and clinical research organizations may also be subject to regulations under other federal, state and local laws, including, but n limited to, the U.S. Occupational Safety and Health Act, the Resource Conservation and Recovery Act, the Clean Air Act and import, export and customs regulations as well as the laws and regulatio of other countries. Pharmaceutical companies must ensure their compliance with the Foreign Corrupt Practices Act and federal healthcare fraud and abuse laws, including the False Claims Act, and t U.S. government has increased its enforcement activity regarding illegal marketing practices domestically and internationally.

These regulatory requirements impact our operations and differ from one country to another, such that securing the applicable regulatory approvals of one country does not imply the approval another country. However, securing the approval of a more stringent body, e.g., the FDA, may facilitate receiving the approval by a regulatory authority in a different country where the regulato requirements are similar or less stringent. The approval procedures involve high costs and are manpower intensive and usually extend over many years and require highly skilled and professior resources.

FDA Approval Process

The steps required to be taken before a new drug may be marketed in the United States generally include:

- Completion of preclinical laboratory and animal testing;
- The submission to the FDA of an IND application, which must be evaluated and found acceptable by the FDA before human clinical trials may commence;
- Performance of adequate and well-controlled human clinical trials in accordance with FDA's IND regulations to establish the safety and efficacy of the proposed drug for its intended us and
- Submission and approval of a an NDA.

Clinical studies are conducted under protocols detailing, among other things, the objectives of the study, what types of patients may enter the study, schedules of tests and procedures, drugs, dosage and length of study, as well as the parameters to be used in monitoring safety, and the efficacy criteria to be evaluated. A protocol for each clinical study and any subsequent protocol amendments mu be submitted to the FDA as part of the IND application.

In all the countries that are signatories of the Helsinki Declaration, the prerequisite for conducting clinical trials on human subjects is securing the preliminary approval of the competent authorities that country to conduct medical experiments on human subjects in compliance with the other principles established by the Helsinki Declaration.

The clinical testing of a product candidate (also commonly referenced as a "drug product candidate" or a "therapeutic product candidate") generally is conducted in three sequential phases prior approval, but the phases may overlap or be combined. A fourth, or post approval, phase may include additional clinical studies. The phases are generally as follows:

Phase 1. In Phase 1 clinical studies, the product is tested in a small number of patients with the target condition or disease or in healthy volunteers. These studies are designed to evaluate the safe dosage tolerance, metabolism and pharmacologic actions of the product candidate in humans, side effects associated with increasing doses, and, in some cases, to gain early evidence on efficacy. T number of participants included in Phase 1 studies is generally in the range of 20 to 80.

Phase 2. In Phase 2 studies, in addition to safety, the sponsor evaluates the efficacy of the product candidate on targeted indications to determine dosage tolerance and optimal dosage and to identi possible adverse effects and safety risks. Phase 2 studies typically are larger than Phase 1 but smaller than Phase 3 studies and may involve several hundred participants.

Phase 3. Phase 3 studies typically involve an expanded patient population at geographically-dispersed test sites. They are performed after preliminary evidence suggesting effectiveness of the produ candidate has been obtained and are designed to further evaluate clinical efficacy and safety, to establish the overall benefit-risk relationship of the product candidate and to provide an adequate ba for a potential product approval. Phase 3 studies usually involve several hundred to several thousand participants.

Phase 4. Phase 4 clinical trials are post marketing studies designed to collect additional safety data as well as potentially expand a product indication. Post marketing commitments are required of, agreed to by, a sponsor after the FDA has approved a product for marketing. These studies are used to gain additional information from the treatment of patients in the intended therapeutic indicati and to verify a clinical benefit in the case of drugs approved under accelerated approval regulations. If the FDA approves a product while a company has ongoing clinical trials that were not necessa for approval, a company may be able to use the data from these clinical trials to meet all or part of any Phase 4 clinical trial requirement. These clinical trials are often referred to as Phase 4 po approval or post marketing commitments. Failure to promptly conduct Phase 4 clinical trials could result in the inability to deliver the product into interstate commerce, misbranding charges, and ci monetary penalties.

Clinical trials must be conducted in accordance with the FDA's good clinical practices ("GCP"), requirements. The FDA may order the temporary or permanent discontinuation of a clinical study at a time or impose other sanctions if it believes that the clinical study is not being conducted in accordance with FDA requirements or that the participants are being exposed to an unacceptable health ris An institutional review board ("IRB") generally must approve the clinical trial design and patient informed consent at study sites that the IRB oversees and also may halt a study, either temporarily permanently, for failure to comply with the IRB's requirements, or may impose other conditions. Additionally, some clinical studies are overseen by an independent group of qualified experts organiz by the clinical study sponsor, known as a data safety monitoring board or committee. This group recommends whether or not a trial may move forward at designated check points based on access certain data from the study. The clinical study sponsor may also suspend or terminate a clinical trial based on evolving business objectives and/or competitive climate.

As a product candidate moves through the clinical testing phases, manufacturing processes are further defined, refined, controlled and validated. The level of control and validation required by the FD would generally increase as clinical studies progress. We and the third-party manufacturers on which we rely for the manufacture of our product candidates and their respective components (includi the API) are subject to requirements that drugs be manufactured, packaged and labeled in conformity with cGMP. To comply with cGMP requirements, manufacturers must continue to spend tim money and effort to meet requirements relating to personnel, facilities, equipment, production and process, labeling and packaging, quality control, recordkeeping and other requirements.

Assuming completion of all required testing in accordance with all applicable regulatory requirements, detailed information on the product candidate is submitted to the FDA in the form of a an ND requesting approval to market the product for one or more indications, together with payment of a user fee, unless waived. A An NDA includes all relevant data available from pertinent nonclinical a clinical studies, including negative or ambiguous results as well as positive findings, together with detailed information on the chemistry, manufacture, control and proposed labeling, among oth things. To support marketing approval, the data submitted must be sufficient in quality and quantity to establish the safety and efficacy of the product candidate for its intended use to the satisfaction the FDA.

If a an NDA submission is accepted for filing, the FDA begins an in-depth review of the NDA. Under the PDUFA, Prescription Drug User Fee Act (the "PDUFA"), the FDA's goal is to complete initial review and respond to the applicant within twelve months of submission, unless the application relates to an unmet medical need in a serious or life-threatening indication, in which case the go may be within eight months of NDA submission. However, PDUFA goal dates are not legal mandates and FDA response often occurs several months beyond the original PDUFA goal date. Further, t review process and the target response date under PDUFA may be extended if the FDA requests or the NDA sponsor otherwise provides additional information or clarification regarding informati already provided in the NDA. The NDA review process can, accordingly, be very lengthy. During its review of a an NDA, the FDA may refer the application to an advisory committee for revie evaluation and recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it typically follows su recommendations. Data from clinical studies are not always conclusive and the FDA and/or any advisory committee it appoints may interpret data differently than the applicant.

After the FDA evaluates the NDA and inspects manufacturing facilities where the drug product and/or its API will be produced, it will either approve commercial marketing of the drug product wi prescribing information for specific indications or issue a complete response letter indicating that the application is not ready for approval and stating the conditions that must be met in order to secu approval of the NDA. If the complete response letter requires additional data and the applicant subsequently submits that data, the FDA nevertheless may ultimately decide that the NDA does n satisfy its criteria for approval. The FDA could also approve the NDA with a Risk Evaluation and Mitigation Strategies, plan to mitigate risks, which could include medication guides, physici communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. The FDA also may condition approval on, among oth things, changes to proposed labeling, development of adequate controls and specifications, or a commitment to conduct post-marketing testing. Such post-marketing testing may include Phase 4 clinic studies and surveillance to further assess and monitor the product's safety and efficacy after approval. Regulatory approval of products for serious or life-threatening indications may require th participants in clinical studies be followed for long periods to determine the overall survival benefit of the drug.

If the FDA approves one of our therapeutic candidates, we will be required to comply with a number of post-approval regulatory requirements. We will also be required to report, among other thing certain adverse reactions and production problems to the FDA, provide updated safety and efficacy information and comply with requirements concerning advertising and promotional labeling for a of its products. Also, quality control and manufacturing procedures must continue to conform to cGMP after approval, and the FDA periodically inspects manufacturing facilities to assess complian with cGMP, which imposes extensive procedural, substantive and record keeping requirements. If we seek to make certain changes to an approved product, such as certain manufacturing changes, will need FDA review and approval before the change can be implemented. For example, if we change the manufacturer of a product or its API, the FDA may require stability or other data from t new manufacturer, which will take time and is costly to generate, and the delay associated with generating this data may cause interruptions in its ability to meet commercial demand, if any. Wh physicians may use products for indications that have not been approved by the FDA, we may not label or promote the product for an indication that has not been approved. Securing FDA approval f new indications is similar to the process for approval of the original indication and requires, among other things, submitting data from adequate and well-controlled studies that demonstrate t product's safety and efficacy in the new indication. Even if such studies are conducted, the FDA may not approve any change in a timely fashion, or at all.

We rely, and expect to continue to rely, on third parties for the manufacture of clinical and future commercial, quantities of its therapeutic candidates. Future FDA and state inspections may identi compliance issues at these third-party facilities that may disrupt production or distribution or require substantial resources to correct. In addition, discovery of previously unknown problems with product or the failure to comply with applicable requirements may result in restrictions on a product, manufacturer or holder of an approved NDA, including withdrawal or recall of the product from t market or other voluntary, FDA-initiated or judicial action that could delay or prohibit further marketing. Newly discovered or developed safety or efficacy data may require changes to a produc approved labeling, including the addition of new warnings and contraindications, and also may require the implementation of other risk management measures. Many of the foregoing could limit t commercial value of an approved product or require us to commit substantial additional resources in connection with the approval of a product. Also, new government requirements, including tho resulting from new legislation, may be established, or the FDA's policies may change, which could delay or prevent regulatory approval of its products under development.

Section 505(b)(2) New Drug Applications

As an alternate path for FDA approval of new indications or new formulations of previously approved products, a company may file a Section 505(b)(2) NDA, instead of a "stand-alone" or "fu NDA. Section 505(b)(2), was enacted as part of the Drug Price Competition and Patent Term Restoration Act of 1984, otherwise known as the Hatch-Waxman Amendments. Section 505(b)(2) perm the submission of a 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 rig of reference. Some examples of products that may be allowed to follow a 505(b)(2) path to approval are drugs that have a new dosage form, strength, route of administration, formulation or indication

The Hatch-Waxman Amendments permit the applicant to rely upon certain published nonclinical or clinical studies conducted for an approved product or the FDA's conclusions from prior review such studies. The FDA may require companies to perform additional studies or measurements to support any changes from the approved product. The FDA may then approve the new product for all some of the labeled indications for which the reference product has been approved, as well as for any new indication supported by the NDA. While references to nonclinical and clinical data r generated by the applicant or for which the applicant does not have a right of reference are allowed, all development, process, stability, qualification and validation data related to the manufacturing a quality of the new product must be included in an NDA submitted under Section 505(b)(2).

To the extent that the Section 505(b)(2) applicant is relying on the FDA's conclusions regarding studies conducted for an already approved product, the applicant is required to certify to the FI concerning any patents listed for the approved product in the FDA's Orange Book publication. Specifically, the applicant must certify that: (i) the required patent information has not been filed; (ii) t listed patent has expired; (iii) the listed patent has not expired but will expire on a particular date and approval is sought after patent expiration; or (iv) the listed patent is invalid or will not be infring by the new product. The Section 505(b)(2) application also will not be approved until any non-patent exclusivity, such as exclusivity for obtaining approval of a new chemical entity, listed in t Orange Book for the reference product has expired. Thus, the Section 505(b)(2) applicant may invest a significant amount of time and expense in the development of its products only to be subject significant delay and patent litigation before its products may be commercialized.

Orphan Drug Designation

The Orphan Drug Act of 1983 (the "Orphan Drug Act") encourages manufacturers to seek approval of products intended to treat "rare diseases and conditions" with a prevalence of fewer than 200,0 patients in the United States or for which there is no reasonable expectation of recovering the development costs for the product. For products that receive Orphan Drug designation by the FDA, t Orphan Drug Act provides tax credits for clinical research, FDA assistance with protocol design, eligibility for FDA grants to fund clinical studies, waiver of the FDA application fee, and a period seven years of marketing exclusivity for the product following FDA marketing approval. In limited circumstances, the FDA may approve a competing product if the product shows clinical superior over a product with orphan drug designation exclusivity.

Foreign Regulation

In addition to regulations in the United States, we will be subject to a variety of foreign regulations governing clinical trials and commercial sales and distribution of its products. Whether or not obtain FDA approval for a product, we must obtain approval by the comparable regulatory authorities of foreign countries before we can commence clinical trials or marketing of the product in tho countries. The approval process varies from country to country and the time may be longer or shorter than that required for FDA approval. The requirements governing the conduct of clinical tria product licensing, pricing and reimbursement vary greatly from country to country.

Under European Union regulatory systems, a company may submit marketing authorization applications either under a centralized or decentralized procedure. The centralized procedure, which compulsory for medicines produced by biotechnology or those medicines intended to treat acquired immunodeficiency syndrome, cancer, neurodegenerative disorders or diabetes and optional for tho medicines which are highly innovative, provides for the grant of a single marketing authorization that is valid for all European Union member states. Abridged applications for the authorization generic versions of drugs authorized by European Medicines Agency can be submitted to the European Medicines Agency through a centralized procedure referencing the innovator's data a demonstrating bioequivalence to the reference product, among other things. The decentralized procedure provides for mutual recognition of national approval decisions. Under this procedure, the hol of a national marketing authorization may submit an application to the remaining member states. Within 90 days of receiving the applications and assessments report, each member state must deci whether to recognize approval. If a member state does not recognize the marketing authorization, the disputed points are eventually referred to the European Commission, whose decision is binding all member states.

Reimbursement

In the United States and other countries, sales of any products for which we receive regulatory approval for commercial sale will depend in part on the availability of reimbursement from third-pa payers, including government payers, managed care providers, private health insurers and other organizations. Each third-party payer may have its own policy regarding what products it will cover, t conditions under which it will cover such products, and how much it will pay for such products. Third-party payers are increasingly examining the medical necessity and cost effectiveness of medic products and services in addition to safety and efficacy and, accordingly, significant uncertainty exists as to the reimbursement status of newly approved therapeutics. Third-party reimburseme adequate to enable us to realize an appropriate return on our investment in research and product development may not be available for our products.

The passage of the Medicare Prescription Drug, Improvement and Modernization Act of 2003 (the "MMA") sets forth requirements for the distribution and pricing of prescription drugs for Medica beneficiaries, which may affect the marketing of our products. The MMA also introduced a new reimbursement methodology. Moreover, while the MMA applies only to drug benefits for Medica beneficiaries, private payers often follow Medicare coverage policy and payment limitations in setting their own payment rates. Any reduction in payment that results from the MMA may result in similar reduction in payments from non-governmental payers.

More recently, the Inflation Reduction Act of 2022 requires, among other things, the Secretary of the U.S. Department of Health and Human Services to negotiate the price of a set number of hi Medicare spend drugs starting in 2026, requires rebates from manufacturers who increase their drug prices above inflation, and makes several changes to the Medicare Part D benefit that will increa manufacturer liability for drug costs previously borne by the government and beneficiaries under the program.

In addition, in some foreign countries, the proposed pricing for a drug must be approved before it may be lawfully marketed. The requirements governing drug pricing vary widely from country country. For example, the European Union provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimburseme and to control the prices of medicinal products for human use. A member state may approve a specific price for the medicinal product, or it may instead adopt a system of direct or indirect controls the profitability of the company placing the medicinal product on the market.

We expect that there will continue to be a number of federal and state proposals to implement governmental pricing controls. While we cannot predict whether such legislative or regulatory proposa will be adopted, the adoption of such proposals could have a material adverse effect on our business, financial condition and profitability.

Compliance with Environmental Laws

Compliance with applicable environmental requirements during the years ended December 31, 2022 December 31, 2023 and 2021 2022 has not had a material effect upon our capital expenditur earnings or competitive position.

Employees

As of December 31, 2022 December 31, 2023, we had 1 part-time and 28 22 full-time employees, 24 19 of whom were engaged in full-time research and development activities. None of our employe are represented by any collective bargaining unit. We believe that we maintain good relations with our employees.

Properties

Our corporate headquarters is located in Lexington, Bedford, Massachusetts. We currently lease 22,000 square feet of office and lab space in Lexington, Massachusetts under a lease that origina expired on December 31, 2020. On April 23, 2020, October 6, 2021 and March 7, 2023, extensions to our lease for office and lab space were signed between us and 99 Hayden LLC. As a result of t extensions to the original lease executed on May 31, 2007, the lease term now expires on August 31, 2023.
On January 7, 2022, we executed a new lease with Cobalt Propco 2020, LLC for our future corporate headquarters which will be located in Bedford, Massachusetts. The term of the future lease f approximately 20,000 square feet of office and lab space is expected to commence in July 2023, with Bedford, Massachusetts under a lease that was originally executed on January 7, 2022. We mov into our headquarters during the third quarter of 2023. The lease has an initial noncancellable term of ten years.

We terminated our previous lease, as planned, for our previous headquarters in Lexington, Massachusetts, also during the third quarter of 2023.
We believe that our existing and future facilities are adequate to meet our current needs, and that suitable additional alternative spaces will be available in the future on commercially reasonable ter for our future growth.

Available Information

We are subject to the information and periodic reporting requirements of the Securities Exchange Act of 1934, as amended, and, in accordance therewith, we file periodic reports, proxy statements a other information with the Securities and Exchange Commission. We make available, free of charge, our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8 and amendments to these reports on our website at www.pulmatrix.com as soon as reasonably practicable after those reports and other information is electronically filed with, or furnished to, t Securities and Exchange Commission.

ITEM 1A. RISK FACTORS.

The following risk factors, together with all of the other information included or incorporated in this Annual Report on Form 10-K, should be carefully considered. If any of the following risks, eith alone or taken together, or other risks not presently known to us or that we currently believe to not be significant, develop into actual events, then our business, financial condition, results of operatio or prospects could be materially adversely affected. If that happens, the market price of our common stock could decline, and stockholders may lose all or part of their investment.

Risk Factor Summary

We are providing the following summary of the risk factors contained in this Annual Report on Form 10-K to enhance the readability and accessibility of our risk factor disclosures. We encourage y to carefully review the full risk factors contained in this Annual Report on Form 10-K in their entirety for additional information regarding the material factors that make an investment in our securiti speculative or risky. These risks and uncertainties include, but are not limited to, the following:

- We have a history of net losses and may experience future losses;
- We will need to raise additional capital to meet our business requirements in the future and such capital raising may be costly or difficult to obtain and could dilute our stockholde ownership interests;
- We may engage in strategic transactions that could impact our liquidity, increase our expenses and present significant distractions to our management;

- We are a clinical development stage biotechnology biopharmaceutical company and have never been profitable;
- All of our product candidates are still under development, and there can be no assurance of successful commercialization of any of our products;
- Drug development is a long, expensive**,** and inherently uncertain process with a high risk of failure at every stage of development, and results of earlier studies and trials may not l predictive of future trial results;
- If our collaborators are not successful, we may not effectively develop and market some of our therapeutic candidates;
- We may not be able to attract, retain, or manage highly qualified personnel, which could adversely impact our business;
- We face substantial competition in the development of our product candidates and may not be able to compete successfully, and our product candidates may be rendered obsolete by rap technological change;
- If the third parties on which we rely to conduct our clinical trials, to manufacture clinical trial materials, and to assist us with preclinical development do not perform as contractual required or expected, we may not be able to obtain regulatory clearance or approval for, or to commercialize, our products;
- Our failure to successfully acquire, develop and market additional drug candidates or approved drug products could impair our ability to grow;
- We may be subject to claims that our employees, independent consultants or agencies have wrongfully used or inadvertently disclosed confidential information of third parties;
- Market and economic conditions may negatively impact our business, financial condition and share price;
- The COVID-19 pandemic and its ongoing effects have caused interruptions or delays of our clinical studies and may continue to have a significant substantial adverse effect on o business;
- Our ability to use our net operating loss carryforwards to offset future taxable income may be subject to certain limitations;
- Our business is subject to cybersecurity risks.
- Our product candidates must undergo rigorous nonclinical and clinical testing, and we must obtain regulatory approvals, which could be costly and time-consuming and subject us unanticipated delays or prevent us from marketing any products;
- We cannot be certain that any of our current and future product candidates will receive regulatory approval, and without regulatory approval we will not be able to market our product candidates;
- We have limited experience in filing and pursuing applications necessary to gain regulatory approvals, which may impede our ability to obtain timely approvals from the U.S. Food and Dr Administration ("FDA") or foreign regulatory agencies, if at all;
- We and our third-party manufacturers are, and will be, subject to regulations of the FDA and other foreign regulatory authorities;
- We may be unable to adequately protect or enforce our rights to intellectual property, causing us to lose valuable rights. Loss of patent rights may lead us to lose market share and anticipated profit
- Legal proceedings or third-party claims of intellectual property infringement and other challenges may require us to spend substantial time and money and could prevent us from developing commercializing our product candidates;
- The price of our common stock is subject to fluctuation and has been, and may, continue to be volatile;
- Financial reporting obligations of being a public company in the United States are expensive and time-consuming, and our management may be required to devote substantial time to complian matters;
- Anti-takeover provisions under Delaware corporate law may make it difficult for our stockholders to replace or remove our board of directors and could deter or delay third parties fro acquiring us, which may be beneficial to our stockholders; and
- Protective provisions in our charter and bylaws could prevent a takeover which could harm our stockholders.

Risks Related to Our Business

We have a history of net losses and may experience future losses.

We have yet to establish any history of profitable operations. We reported a net loss of $18.8 million $14.1 million and $20.2 million $18.8 million for the fiscal years ended December 3 2022 December 31, 2023 and December 31, 2021, 2022, respectively. As of December 31, 2022 December 31, 2023, we had an accumulated deficit of $273.5 million $287.6 million. We expect to inc additional operating losses for the foreseeable future. There can be no assurance that we will be able to achieve sufficient revenues throughout the year or be profitable in the future.

We will need to raise additional capital to meet our business requirements in the future and such capital raises may be costly or difficult to obtain and could dilute our stockholders' ownersh interests.

Our current capital will be sufficient to enable us to continue operations for at least 12 months following the filing date of this Annual Report. In order to continue our operations and to fully realize of our business objectives, absent any non-dilutive funding from a strategic partner or some other strategic transactions, we will need to raise additional capital, which may not be available reasonable terms, or at all. For instance, we will need to raise additional funds to accomplish the following:

- advancing the research and development of our therapeutic candidates;
- investing in protecting and expanding our intellectual property portfolio, including filing for additional patents to strengthen our intellectual property rights;
- hiring and retaining qualified management and key employees;

- responding to competitive pressures; and
- maintaining compliance with applicable laws.

Any additional capital raised through the sale of equity or equity backed securities will dilute our stockholders' ownership percentages and could also result in a decrease in the market value of c equity securities.

The terms of any securities issued by us in future financing transactions may be more favorable to new investors, and may include preferences, superior voting rights and the issuance of warrants other derivative securities, which may have a further dilutive effect on the holders of any of our securities then outstanding.

Furthermore, any additional capital financing that we may need in the future may not be available on terms favorable to us, or at all. If we are unable to obtain such additional financing on a time basis, we may have to curtail our development activities and growth plans and/or be forced to sell assets, perhaps on unfavorable terms, which would have a material adverse effect on our busines financial condition and results of operations, and ultimately could be forced to discontinue our operations and liquidate, in which event it is unlikely that stockholders would receive any distribution their shares. Further, we may not be able to continue operating if we do not generate sufficient revenues from operations needed to stay in business.

In addition, we may incur substantial costs in pursuing future capital financing, including investment banking fees, legal fees, accounting fees, securities law compliance fees, printing and distributi expenses and other costs. We may also be required to recognize non-cash expenses in connection with certain securities we issue, such as convertible notes and warrants, which may adversely impa our financial condition and cause further dilution to our stockholders.

We are a clinical development stage biotechnology biopharmaceutical company and have never been profitable. We expect to incur additional losses in the future and may never be profitable.

We are a clinical development stage biotechnology biopharmaceutical company. We have not commercialized any product candidates or recognized any revenues from our product sales. All of o product candidates are still in the preclinical or clinical development stage, and none have been approved for marketing or are currently being marketed or commercialized. Our product candidates w require significant substantial additional development, clinical studies, regulatory clearances, and additional investments of time and capital before they can be commercialized. We cannot be certa when or if any of our product candidates will obtain the required regulatory approval.

We have never been profitable and have incurred net losses each year since our inception. Our losses are principally a result of research and development and general administrative expenses in suppo of our operations. We may incur significant substantial additional losses as we continue to focus our resources on prioritizing, selecting and advancing our product candidates. Our ability to genera revenue and achieve profitability depends mainly upon our ability, alone or with others, to successfully develop our product candidates, obtain the required regulatory approvals in various territories a commercialize our product candidates. We may be unable to achieve any or all of these goals with regard to our product candidates. As a result, we may never be profitable or achieve significant and/ sustained revenues.

All of our product candidates are still under development, and there can be no assurance of successful commercialization of any of our products.

All of our research and development programs are in developmental stages. One or more of our product candidates may fail to meet safety and efficacy standards in human testing, even if those produ candidates are found to be effective in animal studies. To develop and commercialize inhaled therapeutic treatment for allergic bronchopulmonary aspergillosis ("ABPA"), acute migraine, and oth iSPERSE™-based product candidates, we must provide the FDA and foreign regulatory authorities with human clinical and non-clinical animal data that demonstrate adequate safety and effectivenes To generate these data, we will have to subject our product candidates to significant substantial additional research and development efforts, including extensive non-clinical studies and clinical testin Our approach to drug discovery development may not be effective or may not result in the development of any drug. Currently our development efforts are primarily focused on PUR1900, PUR310 PUR1800 and PUR1800. PUR1900. Even if PUR1900, PUR3100, PUR1800 and PUR1800 PUR1900 or our other product candidates are successful when tested in animals, such success would not a guarantee of the safety or effectiveness of such product candidates in humans. It can take several years for a product to be approved and we may not be successful in bringing any therapeu candidates to the market. A new drug may appear promising at an early stage of development or after clinical trials and never reach the market, or it may reach the market and not sell, for a variety reasons. For example, the drug may:

- be shown to be ineffective or to cause harmful side effects during preclinical testing or clinical trials;
- fail to receive regulatory approval on a timely basis or at all;
- be difficult to manufacture on a large scale;
- not be economically viable;
- not be prescribed by doctors or accepted by patients;
- fail to receive a sufficient level of reimbursement from government, insurers or other third-party payors; or
- infringe on intellectual property rights of any other party.

If our delivery platform technologies or product development efforts fail to generate product candidates that lead to the successful development and commercialization of products, our business a financial condition will be materially adversely affected.

Drug development is a long, expensive and inherently uncertain process with a high risk of failure at every stage of development, and results of earlier studies and trials may not be predictive future trial results.

We have a number of proprietary drug candidates in research and development ranging from the early discovery research phase through preclinical testing and clinical trials. Preclinical testing a clinical trials are long, expensive and highly uncertain processes. It will take us several years to complete clinical trials and we may not have the resources to complete the development a commercialization of any of our proposed drug candidates. The start or end of a clinical trial, such as our Phase 2b trial for PUR1900 and future trials, can often be delayed or halted due to changi regulatory requirements, manufacturing challenges, required clinical trial administrative actions, slower than anticipated patient enrollment, changing standards of care, availability or prevalence of u of a competitor drug or required prior therapy, clinical outcomes, or financial constraints of us and our partners.

Drug development is a highly uncertain scientific and medical endeavor, and failure can unexpectedly occur at any stage of preclinical and clinical development. Typically, there is a high rate attrition for drug candidates in preclinical and clinical trials due to scientific feasibility, safety, efficacy, changing standards of medical care and other variables. The risk of failure is heightened for c drug candidates that are based on new technologies, such as the application of our dry powder delivery platform, iSPERSE™, including PUR1900, PUR3100, PUR1800, PUR1900 and oth iSPERSE™-based drug candidates currently in discovery research or preclinical development. The failure of one or more of our iSPERSE™-based drug candidates could have a material adverse effe on our business, financial condition, and results of operations.

In addition, the results of preclinical studies and clinical trials of previously published iSPERSE™-based products may not necessarily be indicative of the results of our future clinical trials. The desi of our clinical trials is based on many assumptions about the expected effects of inhaled drugs used historically in the industry and if those assumptions are incorrect, the trials may not produ statistically significant results. Preliminary results may not be confirmed upon full analysis of the detailed results of an early clinical trial. Product candidates in later stages of clinical trials may fail show safety and efficacy sufficient to support intended use claims despite having progressed through initial clinical trials. The data collected from clinical trials of our product candidates may not sufficient to obtain regulatory approval in the United States or elsewhere. Because of the uncertainties associated with drug development and regulatory approval, we cannot determine if, or when, may have an approved product for commercialization or whether we will ever achieve sales of or profits on our product candidates or those we may pursue in the future.

If our collaborators are not successful, or breach their agreements with us, we may not effectively develop and market some of our therapeutic candidates.

At this time, we have entered into a co-development agreement regarding one of our therapeutic candidates and, as a result, we no longer have complete control over the development of this candida We may also enter into co-development agreements for our other therapeutic candidates in the future. If our collaborators do not successfully carry out their contractual duties or meet expect deadlines, or they otherwise breach their contractual obligations to us, we may be delayed or may not obtain regulatory approval for, or commercialize, our product candidates. We are also subject to t terms of such co-development agreements that may affect our ability to develop and manufacture our therapeutic candidates. For example, under the Amendment to the Cipla Agreement, if we do n meet our development milestones on time, we may be required to repurchase Cipla's interest or may not be able to further the development program. As a result of such limitations, we may be unable pursue the most efficient or profitable path in developing our therapeutic candidates.

If our relationships with these collaborators terminate, we believe that we would be able to enter into arrangements with alternative third parties. However, replacing any collaborator could delay o clinical trials and could jeopardize our ability to obtain regulatory approvals and commercialize our product candidates on a timely basis, if at all.

We may not be able to attract, retain, or manage highly qualified personnel, which could adversely impact our business.

Our future success and ability to compete in the biotechnology biopharmaceutical industry is substantially dependent on our ability to identify, attract, and retain highly qualified key manageri scientific, medical, and operations personnel. The market for key employees in the biopharmaceutical, pharmaceutical and biotechnology industries is competitive. The loss of the services of any of o principal members of management or key employees without an adequate replacement or our inability to hire new employees as needed could delay our product development efforts, harm our ability sell our products or otherwise negatively impact our business.

The scientific, research and development personnel upon whom we rely to operate our business have expertise in certain aspects of drug development and clinical development, and it may be diffic to retain or replace these individuals. We conduct our operations at our facilities in Lexington, Bedford, Massachusetts, within the greater Boston area, and this region is headquarters to many oth biopharmaceutical, biotechnology, pharmaceutical, and medical technology companies, as well as many academic and research institutions, and, therefore, we face increased competition for technic and managerial personnel in this region.

In addition, we have scientific, medical and clinical advisors who assist us in designing and formulating our products and with development and clinical strategies. These advisors are not our employe and may have commitments to, or consulting or advisory contracts with, other entities that may limit their availability to us, or may have arrangements with other companies to assist in the developme of products that may compete with ours.

Despite our efforts to retain valuable employees, members of our management and scientific and development teams may terminate their employment with us at any time. Although we have writt employment offer letter agreements with our executive officers, our executive officers can leave their employment at any time, for any reason, with 30 days' notice. A sustained labor shortage increased turnover rates within our employee base, caused by the COVID-19 pandemic and its ongoing effects or as a result of general macroeconomic factors, could lead to increased costs, such increased overtime to meet demand and increased wage rates to attract and retain employees, and could negatively affect our ability to efficiently operate our manufacturing and distribution faciliti and overall business. If we are unable to hire and retain employees capable of performing at a high-level, or if mitigation measures we may take to respond to a decrease in labor availability, such overtime and third-party outsourcing, have unintended negative effects, our business could be adversely affected. An overall labor shortage, lack of skilled labor, increased turnover or labor inflatic caused by the COVID-19 pandemic and its ongoing effects or as a result of general macroeconomic factors, could have a material adverse impact on our operations, results of operations, liquidity cash flows. The loss of the services of any of our executive officers or our other key employees and our inability to find suitable replacements could potentially harm our business, financial conditi and prospects. We do not maintain "key man" insurance policies on the lives of these individuals or the lives of any of our other employees.

We face substantial competition in the development of our product candidates and may not be able to compete successfully, and our product candidates may be rendered obsolete by rap technological change.

The pharmaceutical and biotechnology industry is highly competitive, and we face significant substantial competition from many pharmaceutical, biopharmaceutical and biotechnology companies th are researching and marketing products designed to address the indications for which we are currently developing therapeutic candidates or for which we may develop product candidates in the future

Many of our existing or potential competitors have, or have access to, substantially greater financial, research and development, production, and sales and marketing resources than we do and have greater depth and number of experienced managers. As a result, our competitors may be better equipped than us to develop, manufacture, market and sell competing products. In addition, gaini favorable reimbursement is critical to the success of our product candidates. We are aware of many established pharmaceutical companies in the United States and other parts of the world that have are developing technologies for inhaled drug delivery for the prevention and treatment of respiratory diseases, including GlaxoSmithKline, Mereo BioPharma, Mylan, Savara, Insmed, Satsuma, Bristo Meyers, TFF Pharmaceuticals, Zambon Pharma and Pulmocide, which we consider our potential competitors in this regard. If we are unable to compete successfully with these and other potent future competitors, we may be unable to grow or generate revenue.

The rapid rate of scientific discoveries and technological changes could result in one or more of our product candidates becoming obsolete or noncompetitive. Our competitors may develop or introdu new products that render our iSPERSE™ delivery technology and other product candidates less competitive, uneconomical or obsolete. Some of these technologies may have an entirely differe approach or means of accomplishing similar therapeutic effects compared to our drug candidates. Our future success will depend not only on our ability to develop our product candidates but improve them and keep pace with emerging industry developments. We cannot assure you that we will be able to do so.

We also expect to face increasing competition from universities and other non-profit research organizations. These institutions carry out a significant amount of substantial research and development the areas of respiratory diseases. These institutions are becoming increasingly aware of the commercial value of their findings and are more active in seeking patent and other proprietary rights as w as licensing revenues.

The potential acceptance of therapeutics that are alternatives to ours may limit market acceptance of our product candidates, even if commercialized. Respiratory diseases, including our target diseases and conditions, can also be treated by other medication or drug delivery technologies. These treatments may be widely accepted in medical communities and have a longer history of use. T established use of these competitive drugs may limit the potential for our product candidates to receive widespread acceptance if commercialized.

If the third parties on which we rely to conduct our clinical trials and to assist us with preclinical development do not perform as contractually required or expected, we may not be able to obta regulatory clearance or approval for, or to commercialize, our products.

We do not have the ability to independently conduct our preclinical and clinical trials for our products and we must rely on third parties, such as contract research organizations, medical institutio clinical investigators and contract laboratories to conduct such trials. If these third parties do not successfully carry out their contractual duties or regulatory obligations or meet expected deadlines, these third parties need to be replaced, or if the quality or accuracy of the data they obtain is compromised due to the failure to adhere to our clinical protocols or regulatory requirements or for oth reasons, our preclinical development activities or clinical trials may be extended, delayed, suspended or terminated, and we may not be able to obtain regulatory approval for, or successful commercialize, our products on a timely basis, if at all, and our business, operating results and prospects may be adversely affected. Furthermore, our third-party clinical trial investigators may delayed in conducting our clinical trials for reasons outside of our control, such as, but not limited to, patient enrollment.

We rely on third-party contract vendors to manufacture and supply us with high quality active pharmaceutical ingredients and manufacture our therapeutic candidates in the quantities we requi on a timely basis.

We currently do not manufacture any active pharmaceutical ingredients (“APIs”). Instead, we rely on third-party vendors for the manufacture and supply of our APIs that are used to formulate o therapeutic candidates. We also do not currently own or operate manufacturing facilities and therefore rely, and expect to continue to rely, on third parties to manufacture clinical and commerci quantities of our therapeutic candidates and for quality assurance related to regulatory compliance. If these suppliers or manufacturers are incapable or unwilling to meet our current or future needs our standards or on acceptable terms, if at all, we may be unable to locate alternative suppliers or manufacturers on acceptable terms, if at all, or produce necessary materials or components on our ow

While there may be several alternative suppliers of API in the market, changing API suppliers or finding and qualifying new API suppliers can be costly and can take a significant amount of tim Many APIs require significant lead time to manufacture. There can also be challenges in maintaining similar quality or technical standards from one manufacturing batch to the next. We cou experience a delay in conducting clinical trials of or obtaining regulatory approval for PUR1900, PUR3100, and PUR1800, PUR1900 or our other drug candidates and incur additional costs if v changed API suppliers for any reason. Similarly, replacing our manufacturers could cause us to incur added costs and experience delays in identifying, engaging, qualifying and training any su replacements.

If we are not able to find stable, affordable, high quality, or reliable supplies of the APIs, or if we are unable to maintain our existing or future third-party manufacturing arrangements, we may not able to produce enough supply of our therapeutic candidates or commercialize any therapeutic candidates on a timely and competitive basis, which could adversely affect our business, financi condition or results of operations.

Supply chain and shipping disruptions may result in shipping delays, a significant increase in shipping costs, and could increase product costs and result in lost sales and reputational damag which may have a material adverse effect on our business, operating results and financial condition.

Our third-party manufacturers and suppliers have experienced, and expect to may continue to experience, supply chain disruption and shipping disruptions, including disruptions or delays in loadi container cargo in ports of origin or off-loading cargo at ports of destination, as a result of the COVID-19 pandemic and its ongoing effects, congestion in port terminal facilities, labor supply a shipping container shortages, inadequate equipment and persons to load, dock and offload container vessels and for other reasons. These disruptions may impact our ability to receive our raw materia and certain components required for the manufacture of our clinical trial materials or products in the future, to distribute our products in a cost-effective and timely manner and to meet demand, all which could have an adverse effect on our financial condition and results of operations. There can be no assurance that further unforeseen events impacting the supply chain will not have a mater adverse effect on us in the future. Additionally, the impacts that supply chain disruptions have on our third-party manufacturers and suppliers are not within our control. It is not currently possible predict how long it will take for these supply chain disruptions to cease or ease. Prolonged supply chain disruption that may impact us or our manufacturers and suppliers could interrupt or delay c clinical trials, product manufacturing, increase raw material and product lead times, increase raw material and product costs, impact our ability to meet customer demand and result in lost sales a reputational damage, all of which could have a material adverse effect on our business, financial condition and results of operations.

We may not be successful in negotiating for an appropriate price in a future sale or assignment of our rights related to our current drug candidates.

We may seek to sell or assign our rights related to our current drug candidates. If completed, any such sale or assignment may be at a substantial discount, the consideration received may not accurate represent the value of the assets sold or assigned and our stockholders may not be entitled to participate in the future prospects of such drug candidates.

Our failure to successfully acquire, develop and market additional drug candidates or approved drug products could impair our ability to grow.

As part of our growth strategy, we may evaluate, acquire, license, develop and/or market additional product candidates and technologies, subject to the availability of adequate financing. However, o internal research capabilities are limited, and we may be dependent upon pharmaceutical and biotechnology companies, academic scientists and other researchers to sell or license products technology to us. The success of this strategy depends partly upon our ability to identify, select and acquire promising pharmaceutical product candidates and products. The process of proposir negotiating and implementing a license or acquisition of a product candidate or approved product is lengthy and complex. Other companies, including some with substantially greater financi marketing and sales resources, may compete with us for the license or acquisition of product candidates and approved products. We have limited resources to identify and execute the acquisition or i licensing of third-party products, businesses and technologies and integrate them into our current infrastructure. Moreover, we may devote resources to potential acquisitions or in-licensi opportunities that are never completed, or we may fail to realize the anticipated benefits of such efforts. We may not be able to acquire the rights to additional product candidates on terms that we fi acceptable, or at all.

Any product candidate that we acquire may require additional development efforts prior to commercial sale, including extensive clinical testing and approval by the FDA and applicable forei regulatory authorities. All product candidates are prone to risks of failure typical of pharmaceutical product development, including the possibility that a product candidate will not be shown to sufficiently safe and effective for approval by regulatory authorities. In addition, we cannot provide assurance that any products that we develop or approved products that we acquire will manufactured profitably or achieve market acceptance. We cannot guarantee that we will be able to successfully conduct the preclinical studies of the identified potential product candidates anticipated.

Our business strategy may include entry into additional collaborative or license agreements. We may not be able to enter into collaborative or license agreements or may not be able to negotia commercially acceptable terms for these agreements.

Our current business strategy may include the entry into additional collaborative or license agreements for the development and commercialization of our product candidates and technologies. T negotiation and consummation of these types of agreements typically involve simultaneous discussions with multiple potential collaborators or licensees and require significant time and resources. addition, in attracting the attention of pharmaceutical and biotechnology company collaborators or licensees, we compete with numerous other third parties with product opportunities as well as t collaborators' or licensees' own internal product opportunities. We may not be able to consummate collaborative or license agreements, or we may not be able to negotiate commercially acceptat terms for these agreements.

If we do enter into such arrangements, we could be dependent upon the subsequent success of these other parties in performing their respective responsibilities and the cooperation of our partners. O collaborators may not cooperate with us or perform their obligations under our agreements with them. We cannot control the amount and timing of our collaborators' resources that will be devoted researching our product candidates pursuant to our collaborative agreements with them. Our collaborators may choose to pursue existing or alternative technologies in preference to those bei developed in collaboration with us. If we do not consummate collaborative or license agreements, we may use our financial resources more rapidly on our product development efforts, continue to def certain development activities or forego the exploitation of certain geographic territories, any of which could have a material adverse effect on our business prospects. Further, we may not be successf in overseeing any such collaborative arrangements. If we fail to establish and maintain necessary collaborative or license relationships, our business prospects could suffer.

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

We employ individuals and contract with independent consultants and agencies that may have previously worked at or conducted business with third parties; and, we may be subject to claims that we our employees, consultants or agencies have inadvertently or otherwise used or disclosed confidential information of our employees' former employers or other third parties. We may also be subject claims that our employees' former employers or other third parties have an ownership interest in our patents. Litigation may be necessary to defend against these claims. There is no guarantee success in defending these claims, and if we are successful, litigation could result in substantial cost and be a distraction to our management and other employees.

Market and economic conditions may negatively impact our business, financial condition and share price.

Concerns over inflation, geopolitical issues, the U.S. financial markets and a declining real estate market, unstable global credit markets and financial conditions, and volatile oil prices have led periods of significant economic instability, diminished liquidity and credit availability, declines in consumer confidence and discretionary spending, diminished expectations for the global economy a expectations of slower global economic growth going forward, increased unemployment rates, and increased credit defaults in recent years. Our general business strategy may be adversely affected any such economic downturns, volatile business environments and continued unstable or unpredictable economic and market conditions. If these conditions continue to deteriorate or do not improve, may make any necessary debt or equity financing more difficult to complete, more costly, and more dilutive. In addition, there is a risk that one or more of our current and future service provide manufacturers, suppliers, hospitals and other medical facilities, our third-party payors, and other partners could be negatively affected by difficult economic times, which could adversely affect o ability to attain our operating goals on schedule and on budget or meet our business and financial objectives.

The COVID-19 pandemic and its ongoing effects have caused interruptions or delays of our clinical studies and may continue to have a significant substantial adverse effect on our business.

In May 2023, the World Health Organization determined that COVID-19 no longer fit the definition of a public health emergency and the U.S. government announced its plan to let the declaration o public health emergency associated with COVID-19 expire on May 11, 2023. The global health crisis caused by the COVID-19 pandemic and its ongoing effects has and may continue to negative impact global economic activity, which, despite progress in vaccination efforts, remains uncertain and cannot be predicted with confidence. The ultimate impact of current and new COVID-19 variar cannot be predicted at this time and could depend on numerous factors, including vaccination rates among the population, the effectiveness of COVID-19 vaccines against new variants and the respon by governmental bodies and regulators. Given the ongoing and dynamic nature of the circumstances, it is difficult to predict the impact of the COVID-19 pandemic and its ongoing effects on o business.

A continuation or worsening of Moreover, the levels of COVID-19 pandemic has had and may continue to have indeterminable adverse effects on general commercial activity and the world econom including market disruption and volatility, seen in the recent past could have an adverse effect on our ability to access capital, on our business, results of operations and financial condition, and on t market price of our common stock. Our business and results of operations have been and may continue to be adversely affected to the extent that COVID-19 or any other epidemic harms the glob economy generally.

In the past, COVID-19 has delayed enrollment in our clinical trials. For example, in April 2020, we were notified that 11 out of 21 clinical sites suspended enrollment in the PUR1900 clinical study d to issues associated with the COVID-19 pandemic. In July 2020, we terminated our Phase 2 clinical study for PUR1900 as a result of the disruptions and safety concerns caused by the COVID- pandemic.

The COVID-19 pandemic has delayed enrollment in our clinical trials and its ongoing effects could, in the future, delay these dates or impact enrollment generally for clinical trials to To the extent v cannot secure sites to enroll patients, patients remain or become subject again to government "stay at home" mandates, patients feel like they cannot safely visit trial sites or patients drop out due COVID-19 related issues.

Moreover, issues, such events could, in the COVID-19 pandemic has had future, delay our current and may continue to have indeterminable adverse effects on general commercial activity and the wor economy, and our business and results of operations have been and may continue to be adversely affected to the extent that COVID-19 or any other epidemic harms the global economy generally. We do not yet know the full extent of potential delays or impact on our business, our relationship with our business partners, our future clinical trials or the global economy as a whole. However, a one or a combination of these events and impact enrollment generally for clinical trials, which could have an adverse effect on the operation of and results from our clinical trials and on our oth business operations.

If we fail to maintain proper and effective internal controls, our ability to produce accurate and timely financial statements could be impaired, which could harm our operating results, our abil to operate our business and investors' views of us.

Ensuring that we have adequate internal financial and accounting controls and procedures in place so that we can produce accurate financial statements on a timely basis is a costly and time-consumi effort that will need to be evaluated frequently. Section 404 of the Sarbanes-Oxley Act of 2002 (the "Sarbanes-Oxley Act") requires public companies to conduct an annual review and evaluation their internal controls. Our failure to maintain the effectiveness of our internal controls in accordance with the requirements of the Sarbanes-Oxley Act could have a material adverse effect on o business. We could lose investor confidence in the accuracy and completeness of our financial reports, which could have an adverse effect on the price of our common stock.

Our ability to use our net operating loss carryforwards to offset future taxable income may be subject to certain limitations

Our ability to use our net operating loss carryforwards to offset future taxable income may be subject to certain limitations. In general, under Section 382 of the Internal Revenue Code of 1986, amended (the "Code") a corporation that undergoes an "ownership change" is subject to annual limitations on its ability to use its pre-change net operating loss carryforwards or other tax attribut ("NOLs"), to offset future taxable income or reduce taxes. Our past issuances of stock and other changes in our stock ownership may have resulted in ownership changes within the meaning of Secti 382 of the Code; accordingly, our pre-change NOLs may be subject to limitation under Section 382. If we determine that we have not undergone an ownership change, the Internal Revenue Servi could challenge our analysis, and our ability to use our NOLs to offset taxable income could be limited by Section 382 of the Code. Future changes in our stock ownership, some of which are outside our control, could result in ownership changes under Section 382 of the Code further limiting our ability to utilize our NOLs. Furthermore, our ability to use NOLs of companies that we may acquire the future may be subject to limitations. For these reasons, we may not be able to use a material portion of the NOLs, even if we attain profitability.

Our business is subject to cybersecurity risks.

Our operations are increasingly dependent on information technologies and services. Threats to information technology systems associated with cybersecurity risks and cyber incidents or attac continue to grow, and include, among other things, storms and natural disasters, terrorist attacks, utility outages, theft, viruses, phishing, malware, design defects, human error, and complicatio encountered as existing systems are maintained, repaired, replaced, or upgraded. Risks associated with these threats include, among other things:

- theft or misappropriation of funds;
- loss, corruption, or misappropriation of intellectual property, or other proprietary, confidential or personally identifiable information (including supplier, clinical data or employee data);
- disruption or impairment of our and our business operations and safety procedures;
- damage to our reputation with our potential partners, patients and the market;
- exposure to litigation;
- increased costs to prevent, respond to or mitigate cybersecurity events.

Although we utilize various procedures and controls to mitigate our exposure to such risk, cybersecurity attacks and other cyber events are evolving and unpredictable. Moreover, we have no contr over the information technology systems of third parties conducting our clinical trials, our suppliers, and others with which our systems may connect and communicate. As a result, the occurrence of cyber incident could go unnoticed for a period of time.
We have cybersecurity insurance coverage in the event we become subject to various cybersecurity attacks, however, we cannot ensure that it will be sufficient to cover any particular losses we m experience as a result of such cyberattacks. Any cyber incident could have a material adverse effect on our business, financial condition and results of operations.

Risks Related to Regulatory Matters

Our product candidates must undergo rigorous nonclinical and clinical testing, and we must obtain regulatory approvals, which could be costly and time-consuming and subject us unanticipated delays or prevent us from marketing any products. We cannot be certain that any of our current and future product candidates will receive regulatory approval, and witho regulatory approval we will not be able to market our product candidates.

Our ability to generate revenue related to product sales, if ever, will depend on the successful development and regulatory approval of our product candidates. We currently have no products approv for sale, and we cannot guarantee that we will ever have marketable products. The development of a product candidate and issues relating to its approval and marketing are subject to extensi regulation, including regulation for safety, efficacy and quality, by the FDA in the United States and comparable regulatory authorities in other countries, with regulations differing from country country. The FDA regulations and the regulations of comparable foreign regulatory authorities are wide-ranging and govern, among other things:

- product design, development, manufacture and testing;
- product labeling;
- product storage and shipping;
- pre-market clearance or approval;
- advertising and promotion; and
- product sales and distribution.

Clinical testing can be costly and take many years, and the outcome is uncertain and susceptible to varying interpretations. We cannot predict whether our current or future trials and studies w adequately demonstrate the safety and efficacy of any of our product candidates or whether regulators will agree with our conclusions regarding the preclinical studies and clinical trials we ha conducted to date, including the clinical trials for PUR1900. The clinical trials of our product candidates may not be completed on schedule, the FDA or foreign regulatory agencies may order us to st or modify our research, or these agencies may not ultimately approve any of our product candidates for commercial sale. The data collected from our clinical trials may not be sufficient to suppo regulatory approval of our various product candidates. Even if we believe the data collected from our clinical trials are sufficient, the FDA has substantial discretion in the approval process and m disagree with our interpretation of the data.

We are not permitted to market our product candidates in the United States until we receive approval of a an NDA from the FDA. Obtaining approval of a an NDA is a lengthy, expensive and uncerta process, and we may not be successful in obtaining approval. The FDA review processes can take years to complete and approval is never guaranteed. We cannot be certain that any of our submissio will be accepted for filing and review by the FDA.

The requirements governing the conduct of clinical trials and manufacturing and marketing of our product candidates outside the United States vary widely from country to country. Foreign approva may take longer to obtain than FDA approvals and can require, among other things, additional testing and different clinical trial designs. Foreign regulatory approval processes include essentially all the risks associated with the FDA approval processes. Some of those agencies also must approve prices of the products. Approval of a product by the FDA does not ensure approval of the same produ by the health authorities of other countries, or vice versa. In addition, changes in regulatory policy in the United States or in foreign countries for product approval during the period of produ development and regulatory agency review of each submitted new application may cause delays or rejections.

If we are unable to obtain approval from the FDA or other regulatory agencies for our product candidates, or if, subsequent to approval, we are unable to successfully market and commercialize o product candidates, we will not be able to generate sufficient revenue to become profitable. Furthermore, the introduction of government price controls or other price-reducing regulations may affect t prices we obtain on our product candidates, if approved and commercialized.

We have limited experience in filing and pursuing applications necessary to gain regulatory approvals, which may impede our ability to obtain timely approvals from the FDA or foreign regulato agencies, if at all.

As a company, we have no experience in late-stage regulatory filings, such as preparing and submitting NDAs, which may place us at risk of delays, overspending and human resources inefficiencie Any delay in obtaining, or inability to obtain, regulatory approval could harm our business.

Any failure by us to comply with existing regulations could harm our reputation and operating results.

We will be subject to extensive regulation by U.S. federal and state and foreign governments in each of the markets where we intend to sell our product candidates if and after we are approved. If w
fail to comply with applicable regulations, including the FDA's pre-or post-approval cGMP requirements, then the FDA or other foreign regulatory authorities could sanction us. Even if a drug is FD
approved, regulatory authorities may impose significant restrictions on a product's indicated uses or marketing or impose ongoing requirements for potentially costly post-marketing studies.

If a regulatory agency discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product
manufactured, or disagrees with the promotion, marketing or labeling of the product, the regulatory agency may impose restrictions on that product or us, including requiring withdrawal of the produ
from the market. If we fail to comply with applicable regulatory requirements, a regulatory agency or enforcement authority may:

- issue warning letters;
- impose civil or criminal penalties;
- suspend regulatory approval;
- suspend any of our ongoing clinical trials;

- refuse to approve pending applications or supplements to approved applications submitted by us;
- impose restrictions on our operations, including closing our contract manufacturers' facilities; or
- seize or detain products or require a product recall.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. Any failure to comply wi ongoing regulatory requirements may significantly and adversely affect our ability to commercialize and generate revenue from our product candidates. If regulatory sanctions are applied or regulatory approval is withdrawn, our value and operating results will be adversely affected. Additionally, if we are unable to generate revenue from sales of our product candidates, our potential f achieving profitability will be diminished and the capital necessary to fund our operations will be increased.

Any action against us for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses, divert management's attention from the operation of o business and damage our reputation. We expend significant resources on compliance efforts and such expenses are unpredictable and might adversely affect our results. Changing laws, regulations a standards might also create uncertainty, higher expenses and increase insurance costs.

We and our third-party manufacturers are, and will be, subject to regulations of the FDA and other foreign regulatory authorities.

We and our contract manufacturers are, and will be, required to adhere to laws, regulations and guidelines of the FDA or other foreign regulatory authorities setting forth current good manufacturi practices. These laws, regulations and guidelines cover all aspects of the manufacturing, testing, quality control and recordkeeping relating to our therapeutic candidates. We and our third-pa manufacturers may not be able to comply with applicable laws, regulations and guidelines. We and our contract manufacturers are and will be subject to unannounced inspections by the FDA, st regulators and similar foreign regulatory authorities outside the United States. Our failure, or the failure of our third-party manufacturers, to comply with applicable laws, regulations and guidelin could result in the imposition of sanctions on us, including fines, injunctions, civil penalties, refusal of regulatory authorities to grant marketing approval of our therapeutic candidates, delay suspension or withdrawal of approvals, license revocation, seizures or recalls of our therapeutic candidates, operating restrictions and criminal prosecutions, any of which could significantly a adversely affect regulatory approval and supplies of our therapeutic candidates, and materially and adversely affect our business, financial condition and results of operations.

Even if we obtain regulatory approvals, our therapeutic candidates will be subject to ongoing regulatory review. If we fail to comply with continuing U.S. and applicable foreign laws, regulatio and guidelines, we could lose those approvals, and our business would be seriously harmed.

Even if our therapeutic candidates receive regulatory approval, we or our commercialization partners, as applicable, will be subject to ongoing reporting obligations, including pharmacovigilance, a the therapeutic candidates and the manufacturing operations will be subject to continuing regulatory review, including inspections by the FDA or other foreign regulatory authorities. The results of th ongoing review may result in the withdrawal of a therapeutic candidate from the market, the interruption of the manufacturing operations and/or the imposition of labeling and/or marketing limitatio Since many more patients are exposed to drugs following their marketing approval, serious but infrequent adverse reactions that were not observed in clinical trials may be observed during t commercial marketing of the therapeutic candidate. In addition, the manufacturer and the manufacturing facilities that we or our commercialization partners use to produce any therapeutic candida will be subject to periodic review and inspection by the FDA and other foreign regulatory authorities. Later discovery of previously unknown problems with any therapeutic candidate, manufacturer manufacturing process, or failure to comply with rules and regulatory requirements, may result in actions, including but not limited to the following:

- restrictions on such therapeutic candidate, manufacturer or manufacturing process;
- warning letters from the FDA or other foreign regulatory authorities;
- withdrawal of the therapeutic candidate from the market;
- suspension or withdrawal of regulatory approvals;

- refusal to approve pending applications or supplements to approved applications submitted by us or our commercial partners;
- voluntary or mandatory recall;
- fines;
- refusal to permit the import or export of our therapeutic candidates;
- product seizure or detentions;
- injunctions or the imposition of civil or criminal penalties; or
- adverse publicity.

If we or our commercialization partners, suppliers, third-party contractors or clinical investigators are slow to adapt, or are unable to adapt, to changes in existing regulatory requirements or t adoption of new regulatory requirements or policies, we or our commercialization partners may lose marketing approval for any of our therapeutic candidates if any of our therapeutic candidates a approved, resulting in decreased or lost revenue from milestones, product sales or royalties.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements and insider trading.

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include intentional failures to comply with any regulations applicable to us, to provide accura information to regulatory authorities, to comply with manufacturing standards we may have established, to comply with federal and state healthcare fraud and abuse laws and regulations, or to repo financial information or data accurately or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws a regulations intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discountir marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee misconduct could also involve the improper use of information obtained in t course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. We have adopted a Code of Business Conduct, but it is not always possible to identify and det employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risk.

If we fail to comply with federal or state "fraud and abuse" laws, the failure to comply with these laws may adversely affect our business, financial condition and results of operations.

In the United States, we will be subject to various federal and state health care "fraud and abuse" laws, including anti-kickback laws, false claims laws and other laws intended to reduce fraud and abu the healthcare industry, which could affect us, particularly upon successful commercialization of our products in the United States. The federal Anti-Kickback Statute makes it illegal for any perso including a prescription drug manufacturer (or a party acting on our behalf), to knowingly and willfully solicit, receive, offer or pay any remuneration in exchange for or to induce the referral of individual for, or the purchase, order or recommendation of, any good or service, including the purchase, order or prescription of a particular drug for which payment may be made under a feder health care program, such as Medicare or Medicaid. Under federal government regulations, some arrangements, known as safe harbors, are deemed not to violate the federal Anti-Kickback Statu However, these laws are broadly written, and it is often difficult to determine precisely how the law will be applied in specific circumstances. Accordingly, it is possible that our practices may challenged under the federal Anti-Kickback Statute. False claims laws prohibit anyone from knowingly and willfully presenting or causing to be presented for payment to third-party payers, includi government payers, claims for reimbursed drugs or services that are false or fraudulent, claims for items or services that were not provided as claimed, or claims for medically unnecessary items services. Cases have been brought under false claims laws alleging that off-label promotion of pharmaceutical products or the provision of kickbacks has resulted in the submission of false claims governmental health care programs. Under the Health Insurance Portability and Accountability Act of 1996, we are prohibited from knowingly and willfully executing a scheme to defraud any hea care benefit program, including private payers, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement connection with the delivery of or payment for health care benefits, items or services. Violations of fraud and abuse laws may be punishable by criminal and/or civil sanctions, including fines, penalti and/or exclusion or suspension from federal and state health care programs such as Medicare and Medicaid and debarment from contracting with the U.S. government. In addition, private individua have the ability to bring actions on behalf of the government under the federal False Claims Act as well as under the false claims laws of several states.

Many states have adopted laws similar to the federal Anti-Kickback Statute, some of which apply to the referral of patients for, or purchase, order or recommendation of, goods or services reimburs by any source, not just governmental payers. The scope and enforcement of these laws are uncertain and subject to change in the current environment of healthcare reform. We cannot predict the impa on our business, financial condition nor results of operations of any changes in these laws. Any state or federal regulatory review of us, regardless of the outcome, would be costly and time-consumir Law enforcement authorities are increasingly focused on enforcing these laws, and if we are challenged under of one of these laws, we could be required to pay a fine and/or penalty and could suspended or excluded from participation in federal or state health care programs, and our business, results of operations and financial condition may be adversely affected.

Risks Related to Our Financial Position and Need for Additional Capital

We will be required to raise additional capital to fund our operations, and we may not be able to continue as a going concern if we are unable to do so.

Pharmaceutical product development, which includes research and development, preclinical and clinical studies and human clinical trials, is a time-consuming and expensive process that takes years complete. We anticipate that our expenses will increase substantially remain at a high level as we advance terminate our PUR1900 to a new Phase 2b trial and pursue development of PUR3100 a PUR1800 or other iSPERSE™-based product candidates, and/or pursue development of iSPERSE™-based pharmaceuticals in additional indications. Based upon our current expectations, we belie that our existing capital resources will enable us to continue planned operations for at least 12 months following the filing date of this Annual Report. We cannot assure you, however, that our plans w not change or that changed circumstances will not result in the depletion of our capital resources more rapidly than we currently anticipate. We will need to raise additional funds, whether through t sale of equity or debt securities, the entry into strategic business collaborations, the establishment of other funding facilities, licensing arrangements, or asset sales or other means, in order to contin our research and development and clinical trial programs for our iSPERSE™-based product candidates and to support our other ongoing activities. However, it may be difficult for us to raise additior funds on reasonable terms or at all. Since inception, we have incurred losses each year and have an accumulated deficit of $273.5 million $287.6 million as of December 31, 2022 December 31, 202 which may raise concerns about our solvency and affect our ability to raise additional capital.

The amount of additional funds we need will depend on a number of factors, including:

- rate of progress and costs of our clinical trials and research and development activities, including costs of procuring clinical materials and operating our manufacturing facilities;
- our success in establishing strategic business collaborations or other sales or licensing of assets, and the timing and amount of any payments we might receive from any such transactio we are able to establish;
- actions taken by the FDA and other regulatory authorities affecting our products and competitive products;
- our degree of success in commercializing any of our product candidates;
- the emergence of competing technologies and products and other adverse market developments;
- the costs of preparing, filing, prosecuting, maintaining and enforcing patent claims and other intellectual property rights or defending against claims of infringement by others;
- the level of our legal expenses; and
- the costs of discontinuing projects and technologies.

We have raised capital in the past primarily through debt and public offerings and private placements of stock. We may in the future pursue the sale of additional equity and/or debt securities, or t establishment of other funding facilities including asset-based borrowings. There can be no assurances, however, that we will be able to raise additional capital through such an offering on acceptat terms, or at all. Issuances of additional debt or equity securities could impact the rights of the holders of our common stock and may dilute their ownership percentage. Moreover, the establishment other funding facilities may impose restrictions on our operations. These restrictions could include limitations on additional borrowing and specific restrictions on the use of our assets, as well prohibitions on our ability to create liens, pay dividends, redeem our stock or make investments.
We also may seek to raise additional capital by pursuing opportunities for the licensing or sale of certain intellectual property and other assets. We cannot offer assurances, however, that any strateg collaborations, sales of securities or sales or licenses of assets will be available to us on a timely basis or on acceptable terms, if at all.

In the event that sufficient additional funds are not obtained through strategic collaboration opportunities, sales of securities, funding facilities, licensing arrangements and/or asset sales on a time basis, we will be required to reduce expenses through the delay, reduction or curtailment of our projects, including PUR1900, PUR3100, PUR1800 or PUR1800 PUR1900 development activities, reduction of costs for facilities and administration. Moreover, if we do not obtain such additional funds, there will be continued doubt may arise about our ability to continue as a going concern a increased risk of insolvency and loss of investment to the holders of our securities. If we are or become insolvent, investors in our stock may lose the entire value of their investment.

Our long-term capital requirements are subject to numerous risks.

Our long-term capital requirements are expected to depend on many potential factors, including, among others:

- the number of product candidates in development;
- the regulatory clarity and path of each of our product candidates;
- the progress, success and cost of our clinical trials and research and development programs, including manufacturing;
- the costs, timing and outcome of regulatory review and obtaining regulatory clarity and approval of our product candidates and addressing regulatory and other issues that may arise pos approval;
- the costs of enforcing our issued patents and defending intellectual property-related claims;
- the costs of manufacturing, developing sales, marketing and distribution channels;
- our ability to successfully commercialize our product candidates, including securing commercialization agreements with third parties and favorable pricing and market share; and
- our consumption of available resources more rapidly than currently anticipated, resulting in the need for additional funding sooner than anticipated.

We may engage in strategic transactions that could impact our liquidity, increase our expenses and present significant distractions to our management.

From time to time, we may consider strategic transactions, such as acquisitions of companies, business combinations, asset purchases and out-licensing or in-licensing of products, product candidates technologies. Additional potential transactions that we may consider include a variety of different business arrangements, including spin-offs, strategic partnerships, joint ventures, restructuring divestitures, business combinations and investments. Any such transaction may require us to incur non-recurring or other charges, may increase our near- and long-term expenditures and may po significant integration challenges or disrupt our management or business, which could adversely affect our business, financial condition and results of operations. These transactions may ent numerous operational and financial risks, including:

- exposure to unknown liabilities;
- disruption of our business and diversion of our management's time and attention in order to develop acquired products, product candidates or technologies;
- incurrence of substantial debt or dilutive issuances of equity securities to pay for such transactions;
- higher-than-expected transaction and integration costs;
- write-downs of assets or goodwill or impairment charges;
- increased amortization expenses;
- difficulty and cost in combining the operations and personnel of any acquired businesses or product lines with our operations and personnel;
- impairment of relationships with key suppliers or customers of any acquired businesses or product lines due to changes in management and ownership; and
- inability to retain key employees of any acquired businesses.

Accordingly, although there can be no assurance that we will undertake or successfully complete any transactions of the nature described above, any transactions that we do complete may be subject the foregoing or other risks and could have a material adverse effect on our business, financial condition and results of operations.

Risks Related to Our Intellectual Property

We may be unable to adequately protect or enforce our rights to intellectual property, causing us to lose valuable rights. Loss of patent rights may lead us to lose market share and anticipat profits.

Our success, competitive position and future revenues depend, in part, on our ability to obtain patent protection for our products, methods, processes and other technologies, to preserve our tra secrets, to prevent third parties from infringing on our proprietary rights and to operate without infringing the proprietary rights of third parties. Despite our efforts to protect our proprieta technologies and processes, it is possible that competitors or other unauthorized third parties may obtain, copy, use or disclose proprietary technologies and processes.

We try to protect our proprietary position by, among other things, filing U.S., European and other patent applications related to our product candidates, methods, processes and other technologies, prevent third parties from infringing on our proprietary rights and to operate without infringing the proprietary rights of third parties.

Because the patent position of pharmaceutical companies involves complex legal and factual questions, we cannot predict the validity and enforceability of patents with certainty. Our issued pater may not provide us with any competitive advantages or may be held invalid or unenforceable as a result of legal challenges by third parties or could be circumvented. Our competitors may al independently develop inhaled drug delivery technologies or products similar to iSPERSE™ and iSPERSE™-based product candidates or design around or otherwise circumvent patents issued to u Thus, any patents that we own may not provide any protection against competitors. Our pending patent applications, those we may file in the future or those we may license from third parties may r result in patents being issued. Even if these patents are issued, they may not provide us with proprietary protection or competitive advantages. The degree of future protection to be afforded by o proprietary rights is uncertain because legal means afford only limited protection and may not adequately protect our rights or permit us to gain or keep our competitive advantage.

Furthermore, the issuance of a patent, while presumed valid and enforceable, is not conclusive as to its validity or its enforceability and it may not provide us with adequate proprietary protection competitive advantages against competitors with similar products. Competitors may also be able to design around our patents. Other parties may develop and obtain patent protection for more effecti technologies, designs or methods. We may not be able to prevent the unauthorized disclosure or use of our technical knowledge or trade secrets by consultants, vendors, former employees and curre employees.

Patent rights are territorial, and accordingly, the patent protection we do have will only extend to those countries in which we have issued patents. Even so, the laws of certain countries do not prote our intellectual property rights to the same extent as do the laws of the United States and the European Union. Competitors may successfully challenge our patents, produce similar drugs or produc that do not infringe our patents, or produce drugs in countries where we have not applied for patent protection or that do not respect our patents. Furthermore, it is not possible to know the scope claims that will be allowed in published applications and it is also not possible to know which claims of granted patents, if any, will be deemed enforceable in a court of law.

We have not pursued or maintained, and may not pursue or maintain in the future, patent protection for our product candidates in every country or territory in which we may sell our products, approved. The laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to preve third parties from infringing our patents in all countries outside the United States, or from selling or importing products that infringe our patents in and into the United States or other jurisdictions. Indeed, several companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of some countries do not favor t enforcement of patents and other intellectual property rights, which could make it difficult for us to stop the infringement, misappropriation or other violation of our intellectual property righ generally. Proceedings to enforce our intellectual property rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could p our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in a lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful.

After the completion of prosecution and granting of our patents, third parties may still manufacture and/or market therapeutic candidates in infringement of our patent protected rights. Su manufacture and/or market of our product candidates in infringement of our patent protected rights is likely to cause us damage and lead to a reduction in the prices of our product candidates, there reducing our anticipated profits.

In addition, due to the extensive time needed to develop, test and obtain regulatory approval for our therapeutic candidates, any patents that protect our product candidate may expire during early stag of commercialization. This may reduce or eliminate any market advantages that such patents may give us. Following patent expiration, we may face increased competition through the entry of gene products into the market and a subsequent decline in market share and profits.

In addition, in some cases we may rely on our licensors to conduct patent prosecution, patent maintenance or patent defense on our behalf. Therefore, our ability to ensure that these patents are proper prosecuted, maintained, or defended may be limited, which may adversely affect our rights in our therapeutic products. Any failure by our licensors or development partners to properly conduct pate prosecution, patent maintenance or patent defense could harm our ability to obtain approval or to commercialize our products, thereby reducing our anticipated profits.
Furthermore, our ability to enforce our patent rights depends on our ability to detect infringement. It is difficult to detect infringers who do not advertise the components that are used in their produc Moreover, it may be difficult or impossible to obtain evidence of infringement in a competitor's or potential competitor's product, particularly in litigation in countries other than the U.S. that do r provide an extensive discovery procedure. Any litigation to enforce or defend our patent rights, if any, even if we were to prevail, could be costly and time-consuming and would divert the attention our management and key personnel from our business operations. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded if we were to prevail may not commercially meaningful.

If we are unable to protect the confidentiality of our trade secrets or know-how, such proprietary information may be used by others to compete against us.

In addition to filing patents, we generally try to protect our trade secrets, know-how and technology by entering into confidentiality or non-disclosure agreements with parties that have access to u such as our development and/or commercialization partners, employees, contractors and consultants. We also enter into agreements that purport to require the disclosure and assignment to us of t rights to the ideas, developments, discoveries and inventions of our employees, advisors, research collaborators, contractors and consultants while employed or engaged by us. However, the agreements can be difficult and costly to enforce or may not provide adequate remedies. Any of these parties may breach the confidentiality agreements and willfully or unintentionally disclose o confidential information, or our competitors might learn of the information in some other way. The disclosure to, or independent development by, a competitor of any trade secret, know-how or oth technology not protected by a patent could materially adversely affect any competitive advantage we may have over any such competitor.

To the extent that any of our employees, advisors, research collaborators, contractors or consultants independently develop, or use independently developed, intellectual property in connection with a of our products, disputes may arise as to the proprietary rights to this type of information. If a dispute arises with respect to any proprietary right, enforcement of our rights can be costly a unpredictable, and a court may determine that the right belongs to a third party.

Legal proceedings or third-party claims of intellectual property infringement and other challenges may require us to spend substantial time and money and could prevent us from developing commercializing our product candidates.

Our commercial success also depends upon our ability, and the ability of any third party with which we may partner, to develop, manufacture, market and sell our product candidates and/or products, approved, and use our patent-protected technologies without infringing the patents of third parties. There is considerable patent litigation in the pharmaceutical industry. As the pharmaceutical indust expands and more patents are issued, we face increased risks that there may be patents issued to third parties that relate to our product candidates and technology of which we are not aware or that must challenge to continue our operations as currently contemplated.
We may not have identified all patents, published applications or published literature that affect our business either by blocking our ability to commercialize our products or product candidates, preventing the patentability of one or more aspects of our products or product candidates to us or our licensors, or by covering the same or similar technologies that may affect our ability to market o products and product candidates. For example, we (or the licensor of a product or product candidate to us) may not have conducted a patent clearance search sufficient to identify potentially obstructi third-party patent rights. Moreover, patent applications in the United States are maintained in confidence for up to 18 months after their filing. In some cases, however, patent applications rema confidential in the U.S. Patent and Trademark Office, or the USPTO, for the entire time prior to issuance as a U.S. patent. Patent applications filed in countries outside of the United States are typically published until at least 18 months from their first filing date. Similarly, publication of discoveries in the scientific or patent literature often lags behind actual discoveries. We cannot be certa that we or our licensors were the first to invent, or the first to file, patent applications covering our products and candidates. We also may not know if our competitors filed patent applications f technology covered by our pending applications or if we were the first to invent the technology that is the subject of our patent applications. Competitors may have filed patent applications or receiv patents and may obtain additional patents and proprietary rights that block or compete with our patents.

The development, manufacture, use, offer for sale, sale or importation of our product candidates may therefore infringe on the claims of third-party patents or other intellectual property rights. T nature of claims contained in unpublished patent filings around the world is unknown to us, and it is not possible to know which countries patent holders may choose for the extension of their filin under the Patent Cooperation Treaty or other mechanisms. We may also be subject to claims based on the actions of employees and consultants with respect to the usage or disclosure of intellectu property learned at other employers. The cost to us of any intellectual property litigation or other infringement proceeding, even if resolved in our favor, could be substantial. Some of our competitc may be able to sustain the costs of such litigation or proceedings more effectively because of their substantially greater financial resources. Uncertainties resulting from the initiation, continuation defense of intellectual property litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace. Intellectual property litigation and other proceedin may also absorb significant management time. Consequently, we are unable to guarantee that we will be able to manufacture, use, offer for sale, sell or import our therapeutic candidates in the event an infringement action.

In the event of patent infringement claims, or to avoid potential claims, we may choose or be required to seek a license from a third party and would most likely be required to pay license fees royalties or both. These licenses may not be available on acceptable terms, or at all. Even if we were able to obtain a license, the rights may be non-exclusive, which could potentially limit o competitive advantage. Ultimately, we could be prevented from commercializing a product candidate or be forced to cease some aspect of our business operations if, as a result of actual or threaten patent infringement or other claims, we are unable to enter into licenses on acceptable terms. This inability to enter into licenses could harm our business significantly.

We may be subject to other patent-related litigation or proceedings that could be costly to defend and uncertain in their outcome.

In addition to infringement claims against us, we may in the future become a party to other patent litigation or proceedings before regulatory agencies, including interference, re-examination inter part review, or post grant review proceedings filed with the U.S. Patent and Trademark Office or opposition proceedings in other foreign patent offices regarding intellectual property rights with respect our therapeutic candidates, as well as other disputes regarding intellectual property rights with development and/or commercialization partners, or others with whom we have contractual or oth business relationships. Post-issuance oppositions are not uncommon and we or our development and/or commercialization partners will be required to defend these opposition procedures as a matter course. Opposition procedures may be costly, and there is a risk that we may not prevail, which could harm our business significantly.

Obtaining and maintaining patent protection depends on compliance with various procedures and other requirements, and our patent protection could be reduced or eliminated in case of no compliance with these requirements.

Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to the relevant patent agencies in several stages over the lifetime the patents and /or applications. The relevant patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent application process. many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. However, there are situations in which the failure to comply with t relevant requirements can result in the abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, c competitors might be able to use our technologies and know-how which could have a material adverse effect on our business, prospects, financial condition and results of operation.

If we fail to comply with our obligations under our license agreements, we could lose the rights to intellectual property that is important to our business.

Our current license agreements impose on us various development obligations, payment of royalties and fees based on achieving certain milestones as well as other obligations. If we fail to comp with our obligations under these agreements, the licensor may have the right to terminate the license. In addition, if the licensor fails to enforce its intellectual property, the licensed rights may not adequately maintained. The termination of any license agreements or failure to adequately protect such license agreements could prevent us from commercializing our product candidates or possib future products covered by the licensed intellectual property. Any of these events could materially adversely affect our business, prospects, financial condition and results of operation.

We may be subject to damages resulting from claims that we or our employees have wrongfully used or disclosed alleged trade secrets of their former employers.

Our employees may have been previously employed at other companies in the industry, including our competitors or potential competitors. Although we are not aware of any claims currently pendi against us, we may be subject to claims that these employees or we have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of the former employers of o employees. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction management. If we fail in defending such claims, in addition to paying money claims, we may lose valuable intellectual property rights or personnel. A loss of key personnel or their work product cou hamper or prevent our ability to commercialize product(s), which would materially adversely affect our commercial development efforts.

Risks Related to Our Common Stock

The price of our common stock is subject to fluctuation and has been and may continue to be volatile.

The stock market in general, and Nasdaq in particular, as well as biotechnology companies, have experienced extreme price and volume fluctuations that have often been unrelated or disproportiona to the operating performance of small companies. The market price of our common stock may fluctuate as a result of, among other factors:

- the announcement of new products, new developments, services or technological innovations by us or our competitors;
- actual or anticipated quarterly increases or decreases in revenue, gross margin or earnings, and changes in our business, operations or prospects;
- announcements relating to strategic relationships, mergers, acquisitions, partnerships, collaborations, joint ventures, capital commitments, or other events by us or our competitors;
- conditions or trends in the biotechnology and pharmaceutical industries;
- changes in the economic performance or market valuations of other biotechnology and pharmaceutical companies;
- general market conditions or domestic or international macroeconomic and geopolitical factors unrelated to our performance or financial condition (including, for example, the rece coronavirus outbreak, , the Russia/ conflicts in Ukraine conflict, and Israel, supply chain and recent inflationary pressures);
- purchase or sale of our common stock by stockholders, including executives and directors;
- volatility and limitations in trading volumes of our common stock;
- our ability to obtain financings to conduct and complete research and development activities including, but not limited to, our human clinical trials, and other business activities;
- any delays or adverse developments or perceived adverse developments with respect to the FDA's review of our planned preclinical and clinical trials;
- ability to secure resources and the necessary personnel to conduct clinical trials on our desired schedule;
- failures to meet external expectations or management guidance;

- changes in our capital structure or dividend policy, future issuances of securities, sales or distributions of large blocks of our common stock by stockholders;
- our cash position;
- announcements and events surrounding financing efforts, including debt and equity securities;
- our inability to enter into new markets or develop new products;
- reputational issues;
- analyst research reports, recommendations and changes in recommendations, price targets, and withdrawals of coverage;
- departures and additions of key personnel;
- disputes and litigation related to intellectual property rights, proprietary rights, and contractual obligations;
- changes in applicable laws, rules, regulations, or accounting practices and other dynamics; and
- other events or factors, many of which may be out of our control.

In addition, if the market for stocks in our industry or industries related to our industry, or the stock market in general, experiences a loss of investor confidence, the trading price of our common sto could fluctuate or decline for reasons unrelated to our business, financial condition and results of operations. If any of the foregoing occurs, it could cause our stock price to fall and may expose us lawsuits that, even if unsuccessful, could be costly to defend and a distraction to management.

Moreover, the COVID-19 pandemic and its ongoing effects have resulted in significant financial market volatility and uncertainty since March 2020. A continuation or worsening of the levels market disruption and volatility seen in the recent past as a result of the COVID-19 pandemic and its ongoing effects could have an adverse effect on our ability to access capital, on our business, resu of operations and financial condition, and on the market price of our common stock.

Financial reporting obligations of being a public company in the United States are expensive and time-consuming, and our management may be required to devote substantial time to complian matters.

As a publicly traded company, we incur significant additional legal, accounting and other expenses. The obligations of being a public reporting company require significant expenditures, including co resulting from public company reporting obligations under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the rules and regulations regarding corporate governan practices, including those under the Sarbanes-Oxley Act, the Dodd-Frank Wall Street Reform and Consumer Protection Act, and the Nasdaq Capital Market. These rules require the establishment a maintenance of effective disclosure and financial controls and procedures, internal control over financial reporting and corporate governance practices, among many other complex rules that are oft difficult and time consuming to implement, monitor and maintain compliance with. Moreover, despite recent reforms made possible by the Jumpstart Our Business Startups Act of 2012, the reporti requirements, rules, and regulations will make some activities more time-consuming and costly, particularly as we are no longer an "emerging growth company."

In addition, these rules and regulations make it more difficult and more expensive for us to obtain director and officer liability insurance. Compliance with such requirements also places demands management's time and attention.

In the foreseeable future, we do not intend to pay cash dividends on shares of our common stock so any investor gains will be limited to the value of our shares.

We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. Any gains to stockholders will therefore be limited to the increase, if any, in our share price.

We may be at risk of securities class action litigation.

We may be at risk of securities class action litigation. This risk is especially relevant due to our dependence on positive clinical trial outcomes and regulatory approvals. In the past, biotechnology a pharmaceutical companies have experienced significant stock price volatility, particularly when associated with binary events such as clinical trials and product approvals. If we face such litigation, could result in substantial costs and a diversion of management's attention and resources, which could harm our business and result in a decline in the market price of our common stock.

In the event that we fail to satisfy any of the listing requirements of The NASDAQ Capital Market, Nasdaq, our common stock may be delisted, which could affect our market price and liquidity.

Our common stock is listed on The NASDAQ Capital Market. Nasdaq. For continued listing on The NASDAQ Capital Market, Nasdaq, we will be required to comply with the continued listi requirements, including the minimum market capitalization standard, the minimum stockholders' equity requirement, the corporate governance requirements and the minimum closing bid pri requirement, among other requirements. In the event that we fail to satisfy any of the listing requirements of The NASDAQ Capital Market, Nasdaq, our common stock may be delisted. If our securiti are delisted from trading on The NASDAQ the Nasdaq Stock Market, and we are not able to list our securities on another exchange or to have them quoted on The NASDAQ the Nasdaq Stock Mark our securities could be quoted on the OTC Markets. As a result, we could face significant adverse consequences including:

- a limited availability of market quotations for our securities;
- a determination that our common stock is a "penny stock," which would require brokers trading in our common stock to adhere to more stringent rules and possibly result in a reduc level of trading activity in the secondary trading market for our securities;
- a limited amount of news and analyst coverage; and
- a decreased ability to issue additional securities (including pursuant to short-form registration statements on Form S-3 or obtain additional financing in the future).

We are likely to issue additional equity securities in the future, which are likely to result in dilution to existing investors.

We may seek the additional capital necessary to fund our operations through public or private equity offerings, debt financings, and collaborative and licensing arrangements. To the extent we rai additional capital by issuing equity securities, including in a debt financing where we issue convertible notes or notes with warrants and any shares of our common stock to be issued in a priva placement, our stockholders may experience substantial dilution. We may, from time to time, sell additional equity securities in one or more transactions at prices and in a manner we determine. If v sell additional equity securities, existing stockholders may be materially diluted. In addition, new investors could gain rights superior to existing stockholders, such as liquidation and other preferenc In addition, the exercise or conversion of outstanding options or warrants to purchase shares of capital stock may result in dilution to our stockholders upon any such exercise or conversion.

In addition, as of March 27, 2023 March 25, 2024, 212,877 470,800 shares remained available to be awarded under our Amended and Restated 2013 Employee, Director and Consultant Equi Incentive Plan (the "Incentive Plan"). Further, an aggregate of 419,640 344,306 shares of our common stock could be delivered upon the exercise or conversion of outstanding stock options or restrict stock units under the Incentive Plan and other equity incentive plans we previously assumed. We may also issue additional options, warrants and other types of equity in the future as part of stock-bas compensation, capital raising transactions, technology licenses, financings, strategic licenses or other strategic transactions. To the extent these options are exercised, existing stockholders wou experience additional ownership dilution. In addition, the number of shares available for future grant under our equity compensation plans may be increased in the future, as our equity compensati plan contains an "evergreen" provision, pursuant to which additional shares may be authorized for issuance under the plan each year.

Anti-takeover provisions under Delaware corporate law may make it difficult for our stockholders to replace or remove our board of directors and could deter or delay third parties from acquiri us, which may be beneficial to our stockholders.

We are subject to the anti-takeover provisions of Delaware law, including Section 203 of the General Corporation Law of Delaware (the "DGCL"). Under these provisions, if anyone becomes "interested stockholder," we may not enter into a "business combination" with that person for three (3) years without special approval, which could discourage a third party from making a takeov offer and could delay or prevent a change of control. For purposes of Section 203 of the DGCL, "interested stockholder" means, generally, someone owning fifteen percent (15%) or more of o outstanding voting stock or an affiliate that owned fifteen percent (15%) or more of our outstanding voting stock during the past three (3) years, subject to certain exceptions as described in Section 2 of the DGCL.

Protective provisions in our charter and bylaws could prevent a takeover which could harm our stockholders.

Our certificate of incorporation and bylaws contain a number of provisions that could impede a takeover or prevent us from being acquired, including, but not limited to, a classified board of directo and limitations on the ability of our stockholders to remove a director from office without cause. Each of these charter and bylaw provisions give our board of directors the ability to render mo difficult or costly the completion of a takeover transaction that our stockholders might view as being in their best interests.

ITEM 1B. UNRESOLVED STAFF COMMENTS.

None.

ITEM 1C. CYBERSECURITY.

We operate in the biopharmaceutical industry, which is subject to various cybersecurity risks that could adversely affect our business, financial condition, and results of operations, including intellectu property theft, fraud, extortion, harm to employees or customers, violation of privacy laws and other litigation and legal risk, and reputational risk. We recognize the critical importance of developin implementing, and maintaining robust cybersecurity measures to safeguard our information systems and protect the confidentiality, integrity, and availability of our data. We currently have secur measures in place to protect information and prevent data loss and other security breaches, including a cybersecurity risk assessment program. Both management and the board of directors are active involved in the continuous assessment of risks from cybersecurity threats, including prevention, mitigation, detection, and remediation of cybersecurity incidents.

We have established policies and processes for assessing, identifying, and managing material risk from cybersecurity threats, and have integrated these processes into our overall risk manageme systems and processes. We routinely assess material risks from cybersecurity threats, including any potential unauthorized occurrence on or conducted through our information systems that may res in adverse effects on the confidentiality, integrity, or availability of our information systems or any information residing therein.

Our current cybersecurity risk assessment program includes identification of reasonably foreseeable internal and external risks, the likelihood and potential damage that could result from such risks, a the sufficiency of existing policies, procedures, systems, and safeguards in place to manage such risks. The program outlines governance, policies and procedures, and technology we use to oversee a identify risks from cybersecurity threats and is informed by previous cybersecurity incidents we have observed in our industry.

Following these risk assessments, we re-design, implement, and maintain reasonable safeguards to minimize identified risks; reasonably address any identified gaps in existing safeguards; and regular monitor the effectiveness of our safeguards. Primary responsibility for the day-to-day assessment and management of risks from cybersecurity, including the prevention, mitigation, detection, a remediation of cybersecurity incidents, rests with an IT consultant who reports to management.

As part of our overall risk management system, we monitor and test our safeguards and train our employees on these safeguards. Personnel at all levels and departments are made aware of o cybersecurity policies through trainings.

We engage consultants, or other third parties in connection with our risk assessment processes. These service providers assist us to design and implement our cybersecurity policies and procedures, well as to monitor and test our safeguards. We require each third-party service provider to certify that it has the ability to implement and maintain appropriate security measures, consistent with applicable laws, to implement and maintain reasonable security measures in connection with their work with us, and to promptly report any suspected breach of its security measures that may affect o company.

One of the key functions of our board of directors is informed oversight of our risk management process, including risks from cybersecurity threats. Our board of directors is responsible for monitori and assessing strategic risk exposure, and our executive officers are responsible for the day-to-day management of the material risks we face. Our board of directors administers its cybersecurity ri oversight function directly as a whole, as well as through the audit committee.

To date, no cybersecurity incident (or aggregation of incidents) or cybersecurity threat has materially affected our results of operations or financial condition. However, an actual or perceived breach our security could damage our reputation, interfere with the progress of our clinical trials, interfere with our efforts to pursue regulatory approvals for our product candidates, or subject us to third-pa lawsuits, regulatory fines or other actions or liabilities, any of which could adversely affect our business, operating results or financial condition. We have attempted to preemptively mitigate t financial impact of any cybersecurity incident and currently maintain a cyber liability insurance policy. However, our cyber liability insurance may be inadequate or may not be available in the futu on acceptable terms, or at all. In addition, our cyber liability insurance policy may not cover all claims made against us, and defending a suit, regardless of its merit, could be costly and div management's attention from our business and operations. For further information regarding risks from cybersecurity threats, please refer to "Item 1A. RISK FACTORS—Risks Related to O Business".

ITEM 2. PROPERTIES.

Our corporate headquarters are is located at 99 Hayden Avenue, 36 Crosby Drive, Suite 390, Lexington, Massachusetts. Our current lease for approximately 22,000 square feet of office and lab spa will expire on August 31, 2023. On January 7, 2022, we executed a new lease for our future corporate headquarters which will be located in 100, Bedford, Massachusetts. The term of the future currently lease for approximately 20,000 square feet of office and lab space is expected to commence in July Bedford, Massachusetts under a lease that was originally executed on January 7, 2022. V moved into our headquarters during the third quarter of 2023. The lease provides has an initial noncancellable term of ten years.
We terminated our previous lease, as planned, for base rent our previous headquarters in Lexington, Massachusetts, also during the third quarter of $101 thousand per month, which will increase 3 each year over the ten-year noncancellable term.
2023.

We believe that our facilities are adequate to meet our current needs, and that suitable additional alternative spaces will be available in the future facilities are well-maintained and are both suitable a adequate on commercially reasonable terms for our current and anticipated future needs. growth.

ITEM 3. LEGAL PROCEEDINGS.

From time to time, we may be involved in litigation that arises through the normal course of business. As of the date of this filing, we are not aware of any material legal proceedings to which we or o subsidiary is a party or to which any of our property is subject, nor are we aware of any such threatened or pending litigation or proceedings known to be contemplated by governmental authorities.

There are no material proceedings in which any of our directors, officers or affiliates or any registered or beneficial stockholder of more than 5% of our common stock, or any associate of any of t foregoing, is an adverse party or has a material interest adverse to our interest.

ITEM 4. MINE SAFETY DISCLOSURES.

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES.

Market Information

Our common stock trades on The NASDAQ Nasdaq Capital Market under the symbol "PULM".
On March 27, 2023, the last reported sale price of our common stock on The NASDAQ Capital Market was $2.94 per share.

Stockholders

As of March 27, 2023 March 25, 2024, there were approximately 43 stockholders of record of our common stock.

Dividends

We have not paid dividends to our stockholders since inception and do not plan to pay cash dividends in the foreseeable future. Any future declaration of dividends will depend on o earnings, capital requirements, financial condition, prospects and any other factors that our board of directors deems relevant, as well as compliance with the requirements of state law. general, as a Delaware corporation, we may pay dividends out of surplus capital or, if there is no surplus capital, out of net profits for the fiscal year in which a dividend is declared and/ the preceding fiscal year. We currently intend to retain earnings, if any, for reinvestment in our business.

Unregistered Sales of Securities

None.

Issuer Purchases of Equity Securities

Not applicable.

ITEM 6. RESERVED.

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

The information set forth below should be read in conjunction with our consolidated financial statements and related notes thereto included elsewhere in this Annual Report on Form 10-K. Th discussion and analysis contain forward-looking statements based on our current expectations, assumptions, estimates and projections. These forward-looking statements involve risks a uncertainties. Our actual results could differ materially from those indicated in these forward-looking statements as a result of certain factors, including those discussed in Item 1 of this Annu Report on Form 10-K, entitled "Business," under "Forward-Looking Statements" and Item 1A of this Annual Report on Form 10-K, entitled "Risk Factors." References in this discussion a analysis to "us," "we," "our," or our "Company" refer to Pulmatrix, Inc., a Delaware corporation, and our subsidiary, Pulmatrix Operating Company, Inc., a Delaware corporation.

Overview

We are a clinical-stage biotechnology biopharmaceutical company developing innovative focused on the development of novel inhaled therapies therapeutic products intended to addre serious pulmonary prevent and treat respiratory and other diseases and with important unmet medical needs using our patented iSPERSE™ technology. Our proprietary product pipeli includes treatments for central nervous system ("CNS") disorders using its patented iSPERSE™ technology. The Company's proprietary product pipeline includes treatments for such acute migraine and serious lung diseases such as allergic bronchopulmonary aspergillosis ("ABPA") and Chronic Obstructive Pulmonary Disease ("COPD"), and CNS disorders such acute migraine. allergic bronchopulmonary aspergillosis ("ABPA"). Our product candidates are based on its our proprietary engineered dry powder delivery platform, iSPERSE™, whi seeks to improve therapeutic delivery to the lungs by maximizing local concentrations optimizing pharmacokinetics and reducing systemic side effects to improve patient outcomes.

We design and develop inhaled therapeutic products based on our proprietary dry powder delivery technology, iSPERSE™ (inhaled Small Particles Easily Respirable and Emitted), whi enables delivery of small or large molecule drugs to the lungs by inhalation for local or systemic applications. The iSPERSE™ powders are engineered to be small, dense particles with high efficient dispersibility and delivery to airways. iSPERSE™ powders can be used with an array of dry powder inhaler technologies and can be formulated with a broad range of dr substances including small molecules and biologics. We believe the iSPERSE™ dry powder technology offers enhanced drug loading and delivery efficiency that outperforms tradition lactose-blend inhaled dry powder therapies.

We believe the advantages of using the iSPERSE™ technology include reduced total inhaled powder mass, enhanced dosing efficiency, reduced cost of goods, and improved efficacy, safe and tolerability profiles.
Our goal is to develop breakthrough therapeutic products that are safe, convenient, and more effective than the existing therapeutic products for respiratory and other diseases whe iSPERSE™ properties are advantageous.

Our current pipeline is aligned to this goal as we develop iSPERSE™-based therapeutic candidates which target the prevention and treatment of a range of diseases, including CN disorders and pulmonary diseases. These therapeutic candidates include PUR1900 for the treatment of allergic bronchopulmonary aspergillosis ("ABPA") in patients with asthma and patients with cystic fibrosis ("CF"), PUR3100 for the treatment of acute migraine, and PUR1800 for the treatment of acute exacerbations of chronic obstructive pulmonary disea ("AECOPD"), and PUR1900 for the treatment of ABPA in patients with asthma and in patients with cystic fibrosis ("CF"). Each program is enabled by its unique iSPERSE™ formulati designed to achieve specific therapeutic objectives.

We intend to capitalize on our iSPERSE™iSPERSE™ technology platform and our expertise in inhaled therapeutics to identify new product candidates for the prevention and treatment diseases, including those with significant considerable unmet medical needs, and to build our product pipeline beyond our existing candidates. In order to advance our clinical trials for o therapeutic candidates for respiratory and neurological diseases and leverage the iSPERSE™platform to enable delivery of partnered compounds, we intend to form strategic alliances wi third parties, including pharmaceutical and biotechnology companies or academic or private research institutes.

We expect to continue to incur significant substantial expenses and increasing operating losses for at least the next several years based on our drug development plans. We expect o expenses and capital requirements will increase substantially in connection with our ongoing activities, as we:

- conduct PUR1900 clinical trials focused on the development of an inhaled antifungal therapy to prevent and treat allergic/hypersensitivity response to fungus in the lungs of patients wi asthma and CF;
- pursue*Pursue further clinical studies for PUR3100, an orally inhaled dihydroergotamine ("DHE") including a Phase 2 clinical study for the treatment of acute migraine; migraine. V received Food and Drug Administration ("FDA") acceptance of our Investigational New Drug Application ("IND") and a "study may proceed" letter in September 2023, positioni PUR3100 as Phase 2-ready for potential financing or partnership discussions.*
- *Pursue partnership or other alternatives to monetize or advance PUR1800, focusing on the development of an orally inhaled kinase inhibitor for treatment of AECOPD.*
- *Terminate the PUR1900 Phase 2b study and seek to monetize PUR1900 in the United States.*
- continue to advance PUR1800, focusing on the development of an inhaled kinase inhibitor for treatment of AECOPD;
- capitalize*Capitalize on our proprietary iSPERSE™ technology and our expertise in inhaled therapeutics and particle engineering to identify new product candidates for prevention a treatment of diseases, including those with significant important unmet medical needs; needs.*
- invest*Invest in protecting and expanding our intellectual property portfolio and file for additional patents to strengthen our intellectual property rights; and rights.*
- hire personnel*Seek partnerships and license agreements to support the product development and commercialization of our product development, commercialization and administrati efforts. candidates.*

We do not have any products approved for sale and have not generated any revenue from product sales. We will not generate product sales unless and until we successfully complete clinic developments and obtain regulatory approvals for our product candidates. Additionally, we currently utilize third-party contract research organizations ("CROs") to carry out our clinic development activities and third-party contract manufacturing organizations ("CMOs") to carry out our clinical manufacturing activities as we do not yet have a commercial organizatio If we obtain regulatory approval for any of our product candidates, we expect to incur significant substantial expenses related to developing our internal commercialization capability support product sales, marketing and distribution. Accordingly, we anticipate that we will seek to fund our operations through public or private equity or debt financings, licensi arrangements, collaborations with third parties, non-dilutive grants or other sources, potentially including collaborative commercial arrangements. Likewise, we intend to seek to limit o commercialization costs by partnering with other companies with complementary capabilities or larger infrastructure including sales and marketing.

Because of the numerous risks and uncertainties associated with product development, we are unable to predict the timing or amount of increased expenses or when or if we will be able achieve or maintain profitability. Even if we are able to generate product sales, we may not become profitable. If we fail to become profitable or are unable to sustain profitability on continuing basis, we may be unable to continue our operations at planned levels and be forced to reduce or terminate our operations.

Therapeutic Candidates

PUR3100

In 2020, we developed PUR3100, the iSPERSE™ formulation of DHE, for the treatment of acute migraine. Currently DHE is only available as subcutaneous, intravenous infusion intranasal delivery. If approved for commercialization, PUR3100 has the opportunity to be the first orally inhaled DHE treatment for acute migraine and be an alternative to other acu therapies. Given the oral inhaled route of delivery, PUR3100 is anticipated to provide relief from the rapid onset of migraine symptoms and provide a favorable tolerability profile.

A total of three 14-day good laboratory practice toxicology studies have been completed with PUR3100 to support single-dose clinical studies. We are planning to conduct a chron toxicology study to support long-term dosing. Based on discussions with the FDA, this would complete the non-clinical requirements to support a new drug application ("NDA").

We have completed several interactions with the FDA, and they have confirmed that, in addition to the planned Phase 2 and Phase 3 studies, long-term safety should be assessed in minimum of one hundred patients for six months of dosing and fifty patients for twelve months of dosing. The FDA also confirmed that it will be necessary to perform a safety stu administering PUR3100 to otherwise healthy patients with asthma before an NDA is submitted.

On September 26, 2022, we announced the completion of patient dosing in a Phase 1 clinical study, performed in Australia, designed to assess not only safety, tolerability, a pharmacokinetics of PUR3100 in humans, but also provide preliminary comparative bioavailability data to support the use of the 505(b)(2) pathway for marketing authorization. The stu design was a double-dummy, double-blinded trial to assess the safety, tolerability, and pharmacokinetics of three dose levels of single doses of inhaled PUR3100 with intravenous ("IV placebo, as compared to IV DHE (DHE mesylate injection) with inhaled placebo. Twenty-six healthy subjects were enrolled and each of the four groups contained at least six subjects.

On January 4, 2023, we announced topline results. PUR3100 was well-tolerated and there was a lower incidence of nausea in PUR3100 dose groups compared to IV DHE, and we present the Phase 1 study data at the American Headache Society 65th Annual Meeting in June 2023. In contrast to IV DHE, no vomiting was observed in any of the PUR3100 dose groups. On inhalation of PUR3100 achieved peak exposures in the targeted therapeutic range at all doses and the T_{max} occurred at five minutes after dosing.

Based on the rapid systemic exposure in the therapeutic range and the improved side effect profile relative to IV dosing, we believe the PUR3100 formulation of DHE may differentiate fro approved DHE products or those in development. If effectiveness is demonstrated, PUR3100 may offer the convenience of being self-administered with a pharmacokinetic profile that ma potentially provide rapid onset of action.

In September 2023, we announced that the FDA accepted the PUR3100 IND and the receipt of a "study may proceed" letter for the clinical study: "A Phase 2, Multicenter, Randomize Double-Blind, Placebo-Controlled, Single Event Study to Evaluate the Safety, Tolerability, and Efficacy of PUR3100 (Dihydroergotamine Mesylate Inhalation Powder) in the Acu Treatment of Migraine". We anticipate that this Phase 2 clinical study will initiate once financing or partnership arrangements have been made.

PUR1800

PUR1800 is a Narrow Spectrum Kinase Inhibitor, engineered with our iSPERSE™ technology, being developed for the treatment of acute exacerbations in chronic obstructive pulmona disease (AECOPD). PUR1800 targets p38 MAP kinases (p38MAPK), Src kinases, and Syk kinases. These kinases play a critical role in chronic inflammation and airway remodeling.

We completed the Phase 1b safety, tolerability, and pharmacokinetics clinical study of PUR1800 for patients with stable moderate-severe COPD. Topline data was delivered in the fi quarter of 2022.

The clinical study, performed at the Medicines Evaluation Unit in Manchester, UK, was a randomized, three-way crossover double-blind study with 14 days of daily dosing which includ placebo and one of two doses of PUR1800, and included a 28-day follow up period after each treatment period. A total of 18 adults with stable COPD were enrolled. Safety and tolerability well as systemic pharmacokinetics ("PK") were evaluated.

PUR1800 was well tolerated and there were no observed safety signals. The PK data indicate that PUR1800 results in low and consistent systemic exposure when administered via or inhalation. The topline data, along with the results from chronic toxicology studies, was delivered in the first quarter of 2022 and presented at the American Academy of Allergy, Asthma Immunology (AAAAI) conference in the first quarter of 2023 and support the continued development of PUR1800 for the treatment of AECOPD and other inflammatory respirato diseases. We completed all data analysis to inform a study design for a potential Phase 2 efficacy and safety study, treating subjects with AECOPD. We plan to pursue an appropria partner as a path forward to advance PUR1800 into a Phase 2 clinical trial.

Therapeutic CandidatesToxicology studies in rats and dogs, with durations of six and nine months respectively, are complete. The data from both studies demonstrated that PUR1800 is sa
and well tolerated with chronic dosing, with little to no progression of findings from 28-day studies. We believe that this indicates potential for chronic dosing of PUR1800, enabling us
explore PUR1800 therapy for chronic respiratory diseases such as steroid resistant asthma, COPD, or idiopathic pulmonary fibrosis. While the program is currently in development f
treatment of acute exacerbation of COPD, these positive toxicology study results could expand potential indications and value of the program.

PUR1900

On April 15, 2019, we entered into a Development and Commercialization Agreement (the "Cipla Agreement") with Cipla Technologies LLC ("Cipla") for the co-development ar
commercialization, on a worldwide, except for the Cipla Territory defined below, exclusive basis, of PUR1900, our inhaled iSPERSE™ drug delivery system (the "Product") enabl
formulation of the antifungal drug itraconazole, which is only available as an oral drug, for the treatment of all pulmonary indications, including ABPA in patients with asthma. We enter
into an amendment to the Cipla Agreement on November 8, 2021 (the "Amendment" "Second Amendment"), and all a subsequent amendment on January 6, 2024 (the "Thi
Amendment"). All references to the Cipla Agreement herein refer to the Cipla Agreement, as amended.
The Cipla Agreement will remain in effect in perpetuity, unless otherwise earlier terminated in accordance with its terms. In the event of circumstances affecting the continuity
development of the Product in line with the Cipla Agreement or certain development milestones are not achieved within a specified timeframe discussed in greater detail below, the joi
steering committee ("JSC") will evaluate the cause and effect and make a recommendation as to the most optimal option available to Cipla and us. In such events, the parties are n
obligated to follow the recommendation of the JSC and, either party may elect to terminate (a "Terminating Party") its obligation to fund additional costs and expenses for the developme
and/or commercialization of the Product. If the non-Terminating Party wishes to continue the development of the Product, it will have the right to purchase the rights of the Terminati
Party in the Product at its fair market value. If both Cipla and we abandon the development program, Cipla and we shall make commercially reasonable efforts to monetize the Product ar
development program in connection with the Pulmonary Indications. Cipla and we will equally share the proceeds.

We and Cipla will each be responsible for 60% and 40%, respectively, of our overhead costs and the time spent by our employees and consultants on development of the Product ("Dire
Costs"), in addition to which, Cipla will reimburse us an amount equal to 10% of aggregate Direct Costs upon the achievement of the development milestones set forth in the table belo
potentially bringing the sharing of Direct Costs to a 50/50 basis. We will continue to share all other development costs with Cipla that are not Direct Costs, such as the cost of clinic
research organizations, manufacturing costs and other third-party costs, on a 50/50 basis.
Pursuant to the Cipla Agreement, (i) Third Amendment, all development and commercialization activities with respect to the Product in India, South Africa, Sri Lanka, Nepal, Iran, Yeme
Myanmar and Algeria (such countries, all markets other than the United States (the "Cipla Territory") will be conducted exclusively by Cipla at Cipla's sole cost and expense, and (ii) Cip
shall be entitled to all profits from the sale of the Product in the Cipla Territory, except that if Cipla successfully transfers manufacturing of the Product for the Cipla Territory to
manufacturing site determined by Cipla, we will become entitled to a royalty equal to 2% of net sales in the Cipla Territory.
We continued to develop PUR1900 pursuant to the Cipla Agreement during 2023. We and Cipla were each responsible for 60% and 40%, respectively, of our overhead costs and the tir
spent by our employees and consultants on development of the Product ("Direct Costs"). We have shared all other development costs with Cipla that are not Direct Costs, such as the cost
clinical research organizations, manufacturing costs and other third-party costs, on a 50/50 basis.
Pursuant to the Third Amendment, we and Cipla agreed to stop patient enrollment at 8 subjects in the ongoing Phase 2b clinical study. During the period commencing on January 6, 20
and ending July 30, 2024 (the "Wind Down Period"), we will complete all Phase 2b activities, assign or license all patents to Cipla and their registration with the appropriate authorities
the Cipla Territory, complete a physical and demonstrable technology transfer and secure all data from the Phase 2b study for inclusion in the safety database for the Cipla Territory. W
will share costs with Cipla during the Wind Down Period in the same proportions discussed above but subject to a maximum reimbursement amount by Cipla as approved by the joi
steering committee.

In partnership with Cipla, we initiated a Phase 2 clinical study in 2019, entitled: "A Randomized, Double-Blind, Multicenter, Placebo-Controlled, Phase 2 Study to Evaluate After the Safe
Tolerability, and Pharmacokinetics of Itraconazole Administered as a Dry Powder for Inhalation (PUR1900) in Adult Asthmatic Patients with ABPA." This clinical study was terminated
July 2020 due to the ongoing impact conclusion of the COVID-19 pandemic on patient enrollment Wind Down Period, Pulmatrix will bear no further financial responsibility for t
commercialization and clinical study conduct.
Following termination development of PUR1900 in the Cipla Territory, with such commercialization and development expenses of the Phase 2 clinical study, we conducted a Type C meeti
with the FDA on January 27, 2021, Product in order to discuss the program overall development plan and the current Phase 2b clinical study design. The current Phase 2b clinical stu
design includes a 16-week dosing regimen with an 8-week follow up and is intended to explore potential efficacy endpoints, whereas the terminated Phase 2 clinical study had comprised or
a 4-week dosing regimen with safety and tolerability as its primary endpoint. The longer dosing regimen of the new Phase 2b clinical study is supported by the 6-month inhalation toxicolo
study in dogs completed in April 2020. The new development plan, including the planned current Phase 2b clinical study, was approved on November 8, 2021.
In addition to the terms of the Cipla Agreement described above, if Territory to be borne at Cipla's sole cost and expense after January 6, 2024. We will receive 2% royalties on any of t
below development milestones are not met potential future net sales by the date that is nine months after the applicable deadline for achieving such development milestone, either party m
elect to terminate its obligation to fund additional development costs, in which case either (i) the non-Terminating Party can acquire the rights of the Terminating Party for fair market val
or (ii) the parties will monetize the Product. The table below sets forth the development milestones.

Phase 2b Development Plan – Development Milestones

Development Milestone	Milestone Date
25% of patients enrolled in Phase 2b clinical study are dosed	June 30, 2023
Company delivers summary of key efficacy and safety data to include FEV_1, IgE, ACQ-6, number of subjects withdrawn, any severe adverse events related to the medication and an overall summary table of adverse events ("Topline Results") to the JSC.	June 30, 2024

Phase 3 Development Plan – Development Milestones

Development Milestone	Milestone Date
25% of patients enrolled in Phase 3 clinical study dosed	To be proposed by JSC
Company delivers Topline Results to the JSC	To be proposed by JSC
The Prescription Drug User Fee Act (the "PDUFA")	To be proposed by JSC

PUR3100

In 2020, we developed PUR3100, the iSPERSE™ formulation of DHE, for the treatment of acute migraine. Over 38 million people suffer from migraine in Cipla outside the United State Currently DHE is only available as intravenous infusion or intranasal delivery. If approved for commercialization, PUR3100 should be the first orally inhaled DHE treatment for acu migraine and be an alternative to other acute therapies, such as oral and intravenous triptans that currently represent the majority of the annual migraine prescriptions in the United State Given the oral inhaled route of delivery, PUR3100 is anticipated to provide a rapid onset of migraine symptom relief with a favorable tolerability profile.

A total of three 14-day good laboratory practices ("GLP") toxicology studies have been completed with PUR3100 to support single dose clinical studies. Preparations are underway f chronic toxicology to support long-term dosing and an eventual NDA.

We have completed several interactions with the FDA, and they have confirmed that, in addition to the Planned Phase 2 and Phase 3 studies, long-term safety should be assessed in minimum of one hundred patients for six months of dosing and fifty patients for twelve months of dosing. The FDA also confirmed that it will be necessary to perform a safety stu administering PUR3100 to otherwise healthy patients with asthma before a NDA is submitted.

On September 26, 2022, we announced the completion of patient dosing in a Phase 1 clinical study, performed in Australia, designed to assess not only safety, tolerability, a pharmacokinetics of PUR3100 in humans, but also provide preliminary comparative bioavailability data to support the use of the 505(b)(2) pathway for marketing authorization. The stu design was a double-dummy, double-blinded trial to assess the safety, tolerability, and pharmacokinetics of three dose levels of single doses of inhaled PUR3100 with IV placebo, compared to IV DHE (DHE mesylate injection) with inhaled placebo. Twenty-six healthy subjects were enrolled and each of the four groups contained at least six subjects. On January 2023, we announced topline results. PUR3100 was well-tolerated and there was a lower incidence of nausea in PUR3100 dose groups compared to IV DHE.

No vomiting was observed in any of the PUR3100 dose groups. Oral inhalation of PUR3100 achieved peak exposures in the targeted therapeutic range at all doses and the T_{max} occurred five minutes after dosing.

We believe these data are encouraging and suggest that the orally inhaled formulation of DHE, PUR3100, will result in rapid systemic exposure in the therapeutic range, while minimizi the risk of side effects related to exposure levels associated with IV dosing. We believe the PUR3100 formulation of DHE is highly differentiated from other DHE products already approv or in development, can be immediately self-administered and has a pharmacokinetic profile that may potentially advance the treatment of patients with acute migraine.

We plan to open an IND in the second quarter of 2023 in order to conduct a randomized placebo-controlled Phase 2 clinical study in patients with migraine to assess the safety a effectiveness of two doses of PUR3100, in which the selection of the two doses has been informed by the initial Phase 1 clinical study. We anticipate that this Phase 2 clinical study will initia once financing or partnership arrangements have been made.

PUR1800

We completed the Phase 1b safety, tolerability, and pharmacokinetics of PUR1800 for patients with stable moderate-severe chronic obstructive pulmonary disease ("COPD"). Topline da was delivered in the first quarter of 2022.

The clinical study, performed at the Medicines Evaluation Unit in Manchester, UK, was a randomized, three-way crossover double-blind study with 14 days of daily dosing which includ placebo and one of two doses of PUR1800, and included a 28 day follow up period after each treatment period. A total of 18 adults with stable chronic obstructive pulmonary disea ("COPD") were enrolled. Safety and tolerability as well as systemic PK were evaluated.

PUR1800 was well tolerated and there were no observed safety signals. The PK data indicate that PUR1800 results in low and consistent systemic exposure when administered via or inhalation. The topline data, along with the results from chronic toxicology studies, was delivered in the first quarter of 2022 and presented at the American Academy of Allergy, Asthm and Immunology conference in the first quarter of 2023 and support the continued development of PUR1800 for the treatment of AECOPD and other inflammatory respiratory diseas These data will inform the design of a potential Phase 2 study in the treatment of AECOPD.

Toxicology studies in rats and dogs, with durations of six and nine months respectively, are complete. The data from both studies demonstrated that PUR1800 is safe and well tolerated wi chronic dosing, with little to no progression of findings from 28-day studies. We believe that this indicates potential for chronic dosing of PUR1800, enabling us to explore PUR1800 therap for chronic respiratory disease such as steroid resistant asthma, COPD, or idiopathic pulmonary fibrosis. While the program is currently in development for treatment of acute exacerbati of AECOPD, these positive toxicology study results could expand potential indications and value of the program.

All rights to our kinase inhibitor portfolio, including PUR1800 and PUR5700, reverted to us upon the termination of our License, Development and Commercialization Agreement (t "JJEI License Agreement"), dated December 26, 2019, with Johnson & Johnson Enterprise Innovation, Inc. ("JJEI"). JJEI notified us that they were terminating the JJEI Licen Agreement in April 2021, and the effective date of the termination was July 6, 2021.

Financial Overview

Revenues

To date, we have not generated any product sales. The 2023 and 2022 and 2021 revenue was revenues were primarily generated by from the collaboration agreement and license agreeme with Cipla on Agreement as related to our PUR1900 program, the JJEI License Agreement for our PUR1800 kinase inhibitor, and immaterial royalties from legacy products. Effective as July 6, 2021, the JJEI License Agreement was terminated and all revenues pursuant to the agreement were recognized as of that date.

program.

For more discussion on the Cipla Agreement, please see Note 6, *Significant Agreements*, to our consolidated financial statements included in this report.

Research and Development Expenses

Research and development expenses consist primarily of costs incurred for the research and development of our preclinical and clinical candidates, and include:

- employee-related expenses, including salaries, benefits and stock-based compensation expense;
- expenses incurred under agreements with CROs or CMOs, and consultants that conduct our clinical trials and preclinical activities;
- the cost of acquiring, developing and manufacturing clinical trial materials and lab supplies;
- facility, depreciation and other expenses, which include direct and allocated expenses for rent, maintenance of our facility, insurance and other supplies;
- costs associated with preclinical activities and clinical regulatory operations; and
- consulting and professional fees associated with research and development activities activities.

We expense research and development costs to operations as incurred. We recognize costs for certain development activities, such as clinical trials, based on an evaluation of the progress completion of specific tasks using data such as patient enrollment, clinical site activations or information provided to us by our vendors.

Research and development activities are central to our business model. We utilize a combination of internal and external efforts to advance product development from early-stage work clinical trial manufacturing and clinical trial support. External efforts include work with consultants and substantial work at CROs and CMOs. We support an internal research a development team and facility for our pipeline and other potential development programs. To move these programs forward along our development timelines, a large porti (approximately 83% 86%) of our staff are research and development employees. In addition, we maintain an approximately 22,000 square foot office and research and development facili which includes capital equipment for the manufacture and characterization of our iSPERSE™ powders for our pipeline programs. development efforts. As we identify opportunities f iSPERSE™ in respiratory additional indications, we anticipate additional head count, headcount, capital, and development costs will be incurred to support these programs. Because of t numerous risks and uncertainties associated with product development, however, we cannot determine with certainty the duration and completion costs of these or other current or futu preclinical studies and clinical trials. The duration, costs and timing of clinical trials and development of our product candidates will depend on a variety of factors, including t uncertainties of future clinical and preclinical studies, uncertainties in clinical trial enrollment rates and significant and changing government regulation. In addition, the probability success for each product candidate will depend on numerous factors, including competition, manufacturing capability and commercial viability.

General and Administrative Expenses

General and administrative expenses consist principally of salaries, benefits and related costs such as stock-based compensation for personnel and consultants in executive, finance, busine development, corporate communications and human resource functions, facility costs not otherwise included in research and development expenses, patent filing fees and legal fees. Oth general and administrative expenses include travel expenses, expenses related to being a publicly traded company and professional fees for consulting, auditing and tax services.

We anticipate that our general and administrative expenses will increase in the future as they relate to audit, legal, regulatory, and tax-related services associated with maintaini compliance with exchange listing and Securities and Exchange Commission ("SEC") requirements, director and officer liability insurance, investor relations costs and other costs associat with being a public company. Additionally, if and when we believe a regulatory approval of a product candidate appears likely, we anticipate an increase in staffing and related expenses as result of our preparation for commercial operations, especially as it relates to the sales and marketing of our product candidates.

Critical Accounting Policies and Estimates

ThisOur management's discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared accordance with U.S. generally accepted accounting principles in the United States of America ("U.S. GAAP"). The preparation of these our consolidated financial statements requires us make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses and the disclosure of contingent assets and liabilities in our consolidated financ statements. On an ongoing basis, we evaluate our most critical estimates and judgments, including those related to revenue recognition and the accrual and recognition of research a development expenses. We base our estimates on historical experience, known trends and events, and various other factors assumptions that we believe are believed to be reasonable und 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 evalua these estimates on an ongoing basis. Actual results may differ from these estimates under different assumptions or conditions.

While our Our significant accounting policies are described in more detail in the notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10- we 10-K. We believe the following are our critical accounting policies estimates which involve a significant level of uncertainty at the time the estimate was made, and changes in them ha had or are reasonably likely to be most critical to the judgments and estimates used in the preparation of have a material effect on our financial statements. condition or results of operation

Revenue Recognition

Our principal sources source of revenue during the years ended December 31, 2022 December 31, 2023 and 2021, were 2022 was derived from our collaboration arrangement and licen agreements that relate to the development and commercialization of PUR1900 under Cipla Agreement. Revenue is recognized for the Cipla Agreement and our license, development a commercialization arrangement under over the JJEI Agreement.

At inception, we determine whether contracts are within period of performance using a measure of progress based on costs incurred to date relative to the scope total expected costs (i. cost-to-cost method). A significant level of Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Topic 606, *Revenue from Contract with Custome* ("ASC 606") or other topics, including FASB ASC Topic 808, *Collaborative Arrangements* ("ASC 808"). For contracts that are within judgment is necessary to estimate the scope of ASC 80 the Company evaluates whether the counterparty is a customer for any of the units of account (i.e., distinct goods and services) in the contract. For units of account where the counterpar is considered a customer, the Company applies ASC 606 to those unit(s) of account, including recognition, measurement, presentation, and disclosure guidance. To date, the Company h determined it is appropriate to apply ASC 606 to all contracts and units of account for contracts within the scope of ASC 808.

For contracts and units of account that are determined to be within the scope of ASC 606, revenue is recognized when a customer obtains control of promised goods or services. tot expected costs. The amount of revenue recognized reflects in a given period is dependent on the consideration accuracy of our estimate of the total expected costs. When estimating tot expected costs, we make assumptions and estimates regarding the total amount of internal and external resources required to which we expect satisfy the performance obligation, includi the contracted scope of work with Cipla and tasks required to be entitled completed, along with our ability and that of our contracted third parties to receive in exchange successfully car out expected duties, achieve certain regulatory requirements and meet expected deadlines. We evaluate our measure of progress to recognize revenue for these goods agreements at ea reporting date and, services. To achieve this core principle, we apply as necessary, adjust the following five steps (i) identify the measure of progress and related revenue recognition. We al evaluate contract with the customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performan obligations in the contract; modifications and (v) recognize revenue when or as we satisfy a performance obligation. The Company only applies the five-step model to contracts when it probable that the Company will collect the consideration it is entitled to in exchange for the goods or services it transfers to the customer.

Performance obligations promised in a contract are identified at contract inception based on the goods and services that are both capable of being distinct and are distinct in the context the contract. To the extent a contract includes multiple promised goods and services, we apply judgment amendments to determine whether promised goods and services are both capable being distinct and distinct in the context of the contract. If these criteria are not met, the promised goods and services are any changes should be accounted for as a combined performan obligation.

The transaction price is determined based on the consideration to which we will be entitled in exchange for transferring goods and services to the customer. At the inception of each contra that includes research prospectively or development milestone payments, we evaluate whether the milestones are considered probable of being achieved and estimates the amount to included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in t transaction price. Milestone payments that are not within our control or the licensee, such as regulatory approvals, are not considered probable of being achieved until those approvals a received. We evaluate factors such as the scientific, clinical, regulatory, commercial, and other risks that must be overcome to achieve the particular milestone in making this assessmer There is considerable judgment involved in determining whether it is probable that a significant revenue reversal would not occur. At the end of each reporting period, we reevaluate t probability of achievement of all milestones subject to constraint and, if necessary, adjust the estimate of the overall transaction price. Any such adjustments are recorded on a cumulati catch-up basis, which would affect revenues and earnings in the period of adjustment. basis.

If the license to the Company's intellectual property is determined to be distinct from the other promises or performance obligations identified in the arrangement, the Company recogniz revenue from non-refundable, upfront fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. In assessi whether a promise or performance obligation is distinct from the other promises, the Company considers factors such as the research, development, manufacturing and commercializati capabilities of the collaboration partner and the availability of the associated expertise in the general marketplace. In addition, the Company considers whether the counterparty can bene from a promise for its intended purpose without the receipt of the remaining promise, whether the value of the promise is dependent on the unsatisfied promise, whether there are oth vendors that could provide the remaining promise, and whether it is separately identifiable from the remaining promise. For licenses that are combined with other promises, the Compa utilizes judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, over time, the appropriate method of measuring progress for purposes of recognizing revenue. The Company evaluates the measure of progress each reporting period and, if necessar adjusts the measure of performance and related revenue recognition. The measure of progress, and thereby periods over which revenue should be recognized, are subject to estimates b management and may change over the course of the research and development and licensing agreement. Such a change could have a material impact on the amount of revenue the Compa records in future periods.

The promises under the Company's arrangements may include research and development services to be performed by the Company on behalf of the counterparty. Payments reimbursements from customers resulting from the Company's research and development efforts are recognized as the services are performed and presented on a gross basis because t Company is the principal for such efforts. The Company uses an input method, according to the ratio of costs incurred to the total costs expected to be incurred in the future to satisfy t performance obligation. In management's judgment, this input method is the best measure of the transfer of control of the performance obligation. Amounts received prior to reven recognition are recorded as deferred revenue. Amounts expected to be recognized as revenue within the 12 months following the balance sheet date are classified as current portion deferred revenue in the accompanying consolidated balance sheets. Amounts not expected to be recognized as revenue within the 12 months following the balance sheet date are classified deferred revenue, net of current portion. Reimbursements from and payments to the counterparty that are the result of a collaborative relationship, instead of a customer relationship, su as co-development activities, are recognized as the services are performed and presented as a reduction to research and development expense. To date, the Company has determined that arrangements which include research and development services have been transacted with customers and recognized on a gross basis using ASC 606.

For contracts that include sales-based royalties, including milestone payments upon first commercial sales and milestone payments based on a level of sales, which are the result of customer-vendor relationship and for which the license is deemed to be the predominant item to which the royalties relate, we recognize revenue at the later of (i) when the related sal occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied or partially satisfied.

If an arrangement is determined to contain customer options that allow the customer to acquire additional goods or services, the goods and services underlying the customer options that a not determined to be material rights are not considered to be performance obligations at the outset of the arrangement, as they are contingent upon option exercise. The Company evaluat the customer options for material rights, or options to acquire additional goods or services for free or at a discount. If the customer options are determined to represent a material right, t material right is recognized as a separate performance obligation at the outset of the arrangement. The Company allocates the transaction price to material rights based on the relati standalone selling price, which is determined based on the identified discount and the probability that the customer will exercise the option. Amounts allocated to a material right are n recognized as revenue until, at the earliest, the option is exercised.

Accrued Research and Development Costs

We have various contracts with third parties related to our research and development activities. Research and development costs are expensed as incurred. Costs that are incurred ar include salaries, benefits, bonus, stock-based compensation, license fees, milestone payments due under license agreements, costs paid but not billed to third-party contractors to perfor research, conduct clinical trials, and develop drug materials and delivery devices; and associated overhead and facilities costs. Clinical trial costs us as of the end of the period are significant component of research and development expenses and include costs associated accrued. Estimating the expense incurred with third-party contractors, CROs and CMO Invoicing CMOs involves significant uncertainty because these service providers may invoice us several months in arrears, on a pre-determined schedule or when contractual milestones a met; however, some require advance payments. We make estimates of the expense incurred in each period based on the information available to us, our knowledge of the nature of t contractual activities generating such costs and communications with the service providers. Although we do not expect our estimates to be materially different from third-par contractors amounts actually incurred, such estimates for the status and timing of services performed can lag several months. We accrue relative to the costs actual status and timing services rendered performed may vary and could result in connection with third-party contractor activities based on our estimate of fees and costs associated with the contract that we rendered during the period and they are expensed as incurred. Research and development costs us reporting amounts that are paid too high or too low in advance of performance a capitalized as prepaid expenses and amortized over the service period as the services are provided. any particular period. To date, our estimates have not been materially different tha amounts actually incurred.

Results of Operations

Comparison of the Years Ended December 31, 2022 December 31, 2023 and 2021 2022

The following table sets forth our results of operations for each of the periods set forth below (in thousands):

	Year ended December 31,			Year Ended December 31,		
	2022	2021	Change	2023	2022	Chang
Revenues	$ 6,071	$ 5,169	$ 902	$ 7,298	$ 6,071	$ 1,22
Operating expenses:						
Research and development	18,240	15,382	2,858	15,518	18,240	(2,72
General and administrative	6,778	6,377	401	6,520	6,778	(25
Impairment of goodwill	-	3,577	(3,577)			
Total operating expenses	25,018	25,336	(318)	22,038	25,018	(2,98
Loss from operations	(18,947)	(20,167)	1,220	(14,740)	(18,947)	4,20
Other income/(expense):						
Other income (expense):						
Interest income	309	7	302	867	309	55
Other expense, net	(198)	(11)	(187)	(248)	(198)	(5
Net loss	$ (18,836)	$ (20,171)	$ 1,335	$ (14,121)	$ (18,836)	$ 4,71

***Revenue Revenues* — Revenue was Revenues were $7.3 million for the year ended December 31, 2023, as compared to $6.1 million for the year ended December 31, 2022, as compared to $5 million for the year ended December 31, 2021, an increase of $0.9 million $1.2 million. The increase is related to $4.6 million more revenues higher activity under the Cipla Agreement duri 2022, which resumed activities following the Amendment in November 2021, and a $3.7 million decrease in license related revenues under the JJEI License Agreement. period.**

***Research and development expenses* — Research and development expense was expenses were $15.5 million for the year ended December 31, 2023, as compared to $18.2 million for the ye ended December 31, 2022, as compared to $15.4 million for the year ended December 31, 2021, an increase a decrease of approximately $2.8 million $2.7 million. The increase decrease w primarily due to increased decreased spend of $2.9 million $2.7 million in costs related to our PUR3100 program, $1.0 million of employment costs, and $0.7 million in costs related to o PUR1800 program, partially offset by an increase of $1.3 million in costs related to our PUR1900 program and $2.6 million $0.4 million of employment and other operating costs, partial offset by decreased spend of $2.7 million in costs primarily related to our PUR1800 program.**
costs.

***General and administrative expenses* — General and administrative expense was expenses were $6.5 million for the year ended December 31, 2023, as compared to $6.8 million for the ye ended December 31, 2022, as compared a decrease of approximately $0.3 million. The decrease was primarily due to $6.4 million for the year ended December 31, 2021, decreased spend $0.7 million in employment costs, partially offset by an increase of $0.4 million. The increase was primarily due to increased in legal and professional services costs of $0.4 million. costs.**

***Impairment of goodwill* — During 2021 we recorded an expense of $3.6 million to fully write off our existing goodwill balance. There was no remaining goodwill balance in 2022.**

Liquidity and Capital Resources

Through December 31, 2022 December 31, 2023, we incurred an accumulated deficit of $273.5 million $287.6 million, primarily as a result of expenses incurred through a combination research and development activities related to our various product candidates and general and administrative expenses supporting those activities. We have financed our operations sin inception primarily through the sale of preferred and common stock, the issuance of convertible promissory notes, term loans, and collaboration and license agreements. Our total cash a cash equivalents balance as of December 31, 2022 December 31, 2023 was $35.6 million $19.2 million.

We anticipate that we will continue to incur losses and that such losses will increase over the next several years due to development costs associated with our iSPERSE™ iSPERSE™ pipeli programs. We expect that our research and development and general and administrative expenses will continue to increase and, as a result, we will need additional capital to fund o operations which as we continue to incur research and development and general and administrative expenses. We may raise such capital through a combination of equity offerings, de financings, other third-party funding and other collaborations and strategic alliances. We are currently exploring financing or partnership arrangements to develop and initiate a potenti Phase 2 clinical study for PUR3100.

We expect that our existing cash and cash equivalents as of December 31, 2022 December 31, 2023 will enable us to fund our operating expenses and capital expenditure requirements for least the next 12 months following the date of this Annual Report on Form 10-K and into the first quarter of 2026. Such projections reflect the Third Amendment with Cipla and operation efficiencies and prioritization of spending implemented in the second quarter of 2023 and the first quarter of 2024. We have based our projections of operating capital requirements assumptions that may prove to be incorrect, and we may use all of our available capital resources sooner than we expect. Because of the numerous risks and uncertainties associated wi research, development, achievement of contingent milestones and commercialization of pharmaceutical products, we are unable to estimate the exact amount of our operating capit requirements.

We have no material off-balance sheet arrangements that have or are reasonably likely to have a current or future effect on our financial condition, changes in financial condition, revenu or expenses, results of operations, liquidity, capital expenditures or capital resources that is material to investors.

The following table sets forth the major sources and uses of cash for each of the periods set forth below (in thousands):

	Year ended December 31,		Year Ended December 31,	
	2022	2021	2023	2022
Net cash used in operating activities	$ (19,356)	$ (19,727)	$ (15,985)	(19,35
Net cash used in investing activities	(86)	(144)	(676)	(8
Net cash provided by financing activities	1,230	43,475	53	1,23
Net (decrease) increase in cash, cash equivalents, and restricted cash	$ (18,212)	$ 23,604		
Net decrease in cash, cash equivalents, and restricted cash			$ (16,608)	(18,21

Cash Flows from Operating Activities ***Net cash used in operating activities***
Net cash used in operating activities for the year ended December 31, 2023 was $16.0 million, which was primarily the result of a net loss of $14.1 million and $4.3 million in cash outflo associated with changes in operating assets and liabilities, partially offset by $2.4 million of net non-cash adjustments.

Net cash used in operating activities for the year ended December 31, 2022 was $19.4 million, which was primarily the result of a net loss of $18.8 million and $3.2 million in cash outflo associated with changes in operating assets and liabilities, partially offset by $2.7 million of net non-cash adjustments.

Net cash used in operating investing activities for the year ended December 31, 2021 was $19.7 million, which was primarily the result of a net loss of $20.2 million and $5.5 million in ca outflows associated with changes in operating assets and liabilities, partially offset by $6.0 million of net non-cash adjustments.
Cash Flows from Investing Activities

Net cash used in investing activities for the years ended December 31, 2022 December 31, 2023 and 2021 were both 2022 was due to purchases of property and equipment.

Cash Flows from Financing Activities ***Net cash provided by financing activities***

Net cash provided by financing activities for the year ended December 31, 2022, was $1.2 million as compared to $43.5 million for December 31, 2023 resulted from proceeds from the year end December 31, 2021 issuance of common stock, net of issuance costs, under the Sales Agreement (as defined below).
Net cash provided by financing activities for the year ended December 31, 2022 resulted primarily from proceeds from the issuance of common stock, net of issuance costs, of $1.4 million und the Sales Agreement (as defined below), partially offset by the payment of preferred stock issuance costs paid in cash during the year. Net cash provided by financing activities for the year end December 31, 2021 resulted from the issuance of common stock, net of issuance costs, of $37.1 million in a registered direct offering the issuance of preferred stock and common stock warran net of issuance costs, of $6.2 million in a registered direct offering and warrant exercises of $0.2 million. December 2021.

Financings

2022 Financings

In May 2021, we entered into an At-The-Market Sales Agreement (the "Sales Agreement") with H.C. Wainwright and Co., LLC ("HCW") to act as our sales agent with respect to the issuance a sale of up to $20,000,000 of our shares of common stock, from time to time in an at-the-market public offering (the "ATM Offering"). Sales of common stock under the Sales Agreement are ma pursuant to an effective shelf registration statement on Form S-3, which was filed with the SEC on May 26, 2021, and subsequently declared effective on June 9, 2021 (File No. 333-256502), and related prospectus. HCW acts as our sales agent on a commercially reasonable efforts basis, consistent with its normal trading and sales practices and applicable state and federal laws, rules a regulations and the rules of The NASDAQ Capital Market. Nasdaq. If expressly authorized by us, HCW may also sell our common stock in privately negotiated transactions. There is no speci date on which the ATM Offering will end, there are no minimum sale requirements and there are no arrangements to place any of the proceeds of the ATM Offering in an escrow, trust or simil account. HCW is entitled to compensation at a fixed commission rate of 3.0% of the gross proceeds from the sale of our common stock pursuant to the Sales Agreement. During the year end December 31, 2023, we sold 13,100 shares of common stock under the Sales Agreement at a weighted-average price of approximately $4.25 per share, which resulted in net proceeds approximately $53 thousand. During the year ended December 31, 2022, we sold 252,013 shares of common stock under the Sales Agreement at a weighted-average price of approximately $5. per share, which resulted in net proceeds of approximately $1.4 million.

2021 Financings

On December 17, 2021, we closed a registered direct offering with certain institutional investors for the issuance and sale of an aggregate of 6,745.008 shares of convertible preferred stock a warrants to purchase up to an aggregate of 281,047 shares of common stock, par value $0.0001 per share, for gross proceeds of $6.8 million or net proceeds of $6.0 million after placement agen fees and other offering expenses. The shares of preferred stock have a stated value of $1,000 per share and are initially convertible into an aggregate of 562,085 shares of common stock a conversion price of $12.00 per share at any time. The common warrants have an exercise price of $13.99 per share. In addition, we issued the placement agent designees warrants to purchase to 36,538 shares of common stock at an exercise price of $14.99 per share. Both the common warrants and the placement warrants are exercisable six months following the date issuance and ha a five-year term. The shares of preferred stock and common warrants were offered by us pursuant to a "shelf" registration statement on Form S-3 (Registration No. 333-256502) previously fil with the Securities and Exchange Commission (the "SEC") on May 26, 2021, and became effective on June 9, 2021.

On February 16, 2021, we closed on a registered direct offering with certain healthcare-focused institutional investors to purchase up to an aggregate of 1,000,000 shares of our common stock $40.00 per share, for gross proceeds $40.0 million or net proceeds of $37.1 million after placement agent's fees and other offering expenses. In connection with the offering, 65,003 warrants wi a five-year expiry were issued to placement agent designees at an exercise price of $49.99 per share. The shares of common stock were offered by us pursuant to a "shelf" registration statement Form S-3 (File No. 333-230225) previously filed with the SEC on March 12, 2019 and declared effective by the SEC on March 15, 2019.

In addition to the above registered direct offerings, during the year ended December 31, 2021, warrants issued in 2019 and 2020 were exercised on a cash basis to purchase 7,202 shares of o common stock. We issued 7,202 shares of our common stock for proceeds of $0.2 million.

Known Trends, Events and Uncertainties

The ultimate impact In May 2023, the World Health Organization determined that COVID-19 no longer fit the definition of a public health emergency and the U.S. government announced its pl to let the declaration of a public health emergency associated with COVID-19 expire on May 11, 2023. The COVID-19 pandemic and its ongoing effects on our operations is unknown are expect to remain a serious threat for an indefinite future period and will depend on future developments, which are highly uncertain and cannot be predicted with confidence. These include but are n limited may continue to the COVID-19 pandemic and its continuing effects on the global economy, new information which may emerge concerning the severity of the COVID-19 pandemic, a any additional preventative and protective actions that regulators, or our board or management, may determine are needed.

The COVID-19 pandemic has created create significant economic uncertainty and volatility in the credit and capital markets, and the ongoing effects of the COVID-19 pandemic, including but n limited to, supply chain issues, global shortages of supplies, materials and products, and contribute to rising global inflation, continue to do so. inflation. In addition, the ongoing conflict betwe Russia conflicts in Ukraine and Ukraine, Israel, including related sanctions and countermeasures, are difficult to predict, and could adversely impact geopolitical and macroeconomic condition the global economy, and contribute to increased market volatility, which may in turn adversely affect our business and operations. operations. We may not be able to raise sufficient addition capital and may tailor our drug candidate development program based on the amount of funding we are able to raise in the future. Nevertheless, there is no assurance that these initiatives will successful.

Other than as discussed above and elsewhere in this report, we are not aware of any trends, events or uncertainties that are likely to have a material effect on our financial condition.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Not applicable.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA.

The information required by this Item 8 is included at the end of this Annual Report on Form 10-K beginning on page F-1.

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

Not applicable.

ITEM 9A. CONTROLS AND PROCEDURES.

Disclosure Controls and Procedures

Our Principal Executive Officer and Principal Financial Officer, after evaluating the effectiveness of our disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15 15(e)) as of the end of the period covered by this Annual Report on Form 10-K, have concluded that, based on such evaluation, our disclosure controls and procedures were effective to ensure th information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in t SEC's rules and forms, and is accumulated and communicated to our management, including our Principal Executive Officer and Principal Financial Officer as appropriate to allow time decisions regarding required disclosure.

Internal Control over Financial Reporting

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rule 13a-15(f) under the Exchange Act. Internal control ov financial reporting is a process designed by, or under the supervision of, our Principal Executive Officer and Principal Financial Officer, and effected by our board of directors, management a other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements for external purposes in accordance wi GAAP, including those policies and procedures that: (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect our transactions and the disposition of o assets, (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in accordance with GAAP and that receipts a expenditures are being made only in accordance with authorizations of our management and board of directors, and (iii) provide reasonable assurance regarding prevention or timely detection unauthorized acquisition, use, or disposition of our assets that could have a material effect on the consolidated financial statements.

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

Management evaluates the effectiveness of our internal control over financial reporting based on the 2013 framework in Internal Control — Integrated Framework issued by the Committee Sponsoring Organizations of the Treadway Commission. Based on this evaluation, management concluded that our internal control over financial reporting was effective as of December 3 2022 December 31, 2023.

Changes in Internal Controls over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during our last fiscal quarter ended December 31, 2022 December 31, 2023 that have materially affected, are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION.

None.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS.

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE

Management and the Board of Directors

The following table sets forth the persons who serve as our executive officers and directors. directors, and their ages as of December 31, 2023.

Name	Age	Position
Teofilo Raad	53	Chief Executive Officer and Director
Peter Ludlum	6768	Interim Chief Financial Officer
Margaret Wasilewski, M.D.	6566	Chief Medical Officer
Richard Batycky, Ph.D.	55	Director
Todd Bazemore	5253	Director
Christopher Cabell M.D.	5455	Director
Michael J. Higgins	6061	Director
Anand Varadan	5657	Director

Management

Teofilo Raad. Mr. Raad was appointed Chief Executive Officer in May 2019. Prior to his appointment, he served as Pulmatrix's Chief Business Officer and led commercial and busine development efforts. He has more than 20 years of commercial healthcare and life science leadership experience and most recently served as Chief Commercial Officer at Option Care from 201 2016, where he helped separate the specialty home infusion business unit from Walgreens to create the nation's largest independent home infusion provider. Prior to that, he was Vice Preside and business unit head at Sunovion with overall responsibility for CNS and respiratory products, including assets in asthma and COPD from 2010 to 2012. During his time at Sunovion, Mr. Ra led multiple products through clinical development to commercialization and implemented new strategic alliances in the US and Japan. Earlier in his career, he also gained direct laun experience with Sporanox®, Janssen's oral itraconazole product to treat fungal infections, and brings that experience to the Company's programs. Mr. Raad holds a BS in Business Administrati from University of Colorado at Boulder and an MBA from Thunderbird Global School of Global Management. We believe that Mr. Raad has extensive business experience running the operatio of biopharmaceutical companies and qualifies him to serve as a member of the Board.

Peter Ludlum. Mr. Ludlum has served as our interim Chief Financial Officer, principal accounting officer and principal financial officer since April 2022, and since December 2021, he h served as our Strategic Advisor – Finance, both pursuant to a November 30, 2021 consulting agreement between the Company and Danforth. Mr. Ludlum has served as an employee wi Danforth Advisors, LLC ("Danforth"), a provider of strategic and operational finance and accounting for life science companies, since December 2021. Prior to Danforth, Mr. Ludlum has work as an independent financial consultant. Previously, Mr. Ludlum served in several executive roles at Emmaus Life Sciences, Inc. (n/k/a EMI Holding, Inc.), a commercial-stage biopharmaceutic company, including Co-President, Chief Business Officer, Executive Vice President and Chief Financial Officer, during his tenure from April 2012 until May 2017. Mr. Ludlum previously serv as the Chief Financial Officer of Energy and Power Solutions, Inc., an energy intelligence company, from April 2008 to December 2011. He received a B.S. in Business and Economics with major in accounting from Lehigh University and an MBA with a concentration in Finance from California State University, Fullerton.

Margaret Wasilewski, M.D. Dr. Wasilewski has served as our Chief Medical Officer since March 2022 and brings extensive experience across different stages of pharmaceutical drug developme in various therapeutic areas. She leverages over 20 years of experience in pharmaceutical drug development. Dr. Wasilewski held various leadership roles at Eli Lilly and Company, Targan Therapeutics, Shire, and Summit Therapeutics. As President of ID Remedies LLC, Dr. Wasilewski has provided scientific, medical, and clinical development consultation to vario biopharmaceutical companies. Her clinical development experience includes bacterial and viral infections, sepsis, neurology, and rare disease. Dr. Wasilewski received a medical degree from Tu University School of Medicine and is board certified in Internal Medicine and completed fellowships in Infectious Diseases and Clinical Pharmacology at the University of California-Sa Francisco. Dr. Wasilewski received an MBA from Indiana University, Kelly School of Business; a master's degree in Nutrition from the University of California-Berkeley and an undergradua degree in Chemistry from Rutgers University.

Board of Directors (Non-Employee Directors)

Richard Batycky, Ph.D. Dr. Batycky was appointed to serve as a director of our Company in November 2019. He is currently the President and Chief Executive Officer of Nocion Therapeuti Inc. having served in such position since 2018. Dr. Batycky has over two decades of experience with biotech start-ups from founding to acquisition across an array of platforms and disease stat with significant notable expertise in inhaled drug development. From 2009 to 2014, he was the Chief Scientific Officer and a founder of Civitas Therapeutics, which was acquired by Acor Therapeutics, Inc., or Acorda. At Acorda, he served as Chief Technology Officer from 2014 to 2018 where he led its novel dry powder inhalation therapy to treat motor issues in Parkinsor patients through to FDA approval as Inbrija™. Prior to Civitas Therapeutics, he was Chief Scientific Officer and Senior VP of R&D at Pulmatrix from 2007 to 2009 and held prior positions Alkermes and Advanced Inhalation Research from 1998 to 2007. Dr. Batycky received his B.Sc. in Chemical Engineering from the University of Calgary and his S.M. and Ph.D. in Chemic Engineering from the Massachusetts Institute of Technology (MIT). We believe that Dr. Batycky's significant noteworthy experience in inhaled drug development in biotechnology compani qualifies him to serve as a member of the Board.

Todd Bazemore. Mr. Bazemore was appointed to serve as a director of our Company in October 2020. Todd Bazemore has served as the President and Chief Operating Officer of Ka Pharmaceuticals, KALA BIO, Inc. since December 2021 and as the Chief Operating Officer from November 2017 through November 2021. Previously, he served as Executive Vice President a Chief Operating Officer of Santhera Pharmaceuticals (USA) Inc., or Santhera, a pharmaceutical company and subsidiary of Santhera Pharmaceuticals Holdings AG, from September 2016 un November 2017. Prior to joining Santhera, Mr. Bazemore served as Executive Vice President and Chief Commercial Officer of Dyax Corp., or Dyax, a biopharmaceutical company focused orphan diseases, between April 2014 and January 2016, when Dyax was acquired by Shire plc. Between April 2012 and September 2013, he served as Vice President, Managed Markets Sunovion Pharmaceuticals, Inc., or Sunovion (a subsidiary of Dainippon Sumitomo Pharma Co. Ltd.), a global biopharmaceutical company focused on serious medical conditions. Prior to th Mr. Bazemore held several roles of increasing responsibility at Sunovion, including Vice President of Sales and Vice President of the Respiratory Business Unit. He received his Bachelor Science from the University of Massachusetts, Lowell. We believe that Mr. Bazemore has extensive business experience running the commercial operations of biopharmaceutical companies a qualifies him to serve as a member of the Board.

Christopher Cabell, M.D. Dr. Cabell was appointed to serve as a director of our Company in June 2020. He is currently the Chief Medical Officer and Executive Vice President at Zura Bio Lt having joined in January 2023. Prior to joining Zura Bio, Dr. Cabell was Chief Medical Officer and Head of Clinical Development at Emergent BioSolutions, Inc., having joined in Februa 2021. Previously, Dr. Cabell spent three (3) years at Arena Pharmaceuticals, Inc. with increasing responsibilities including Head of Research and Development, and Chief Medical Officer fro October 2017 to November 2020. Dr. Cabell spent 10 years at Quintiles Inc. and QuintilesIMS in a variety of management positions including Chief Medical and Scientific Officer, Global Head Medical and Project Management, and Global Head of Business Development from October 2007 to September 2017. Prior to joining Quintiles, Dr. Cabell was on faculty at Duke Univers School of Medicine in the Division of Cardiology. Dr. Cabell is a Fellow of the American College of Cardiology and has over 100 peer reviewed publications including in the New England Journ of Medicine, JAMA, and Annals of Internal Medicine. Board certified in both internal medicine and cardiovascular diseases, Dr. Cabell is an honors graduate of Pennsylvania State Univers and Duke University, earning both his Medical Degree and a Masters in Health Sciences from the latter. We believe that Dr. Cabell's significant noteworthy experience in clinical dr development in biotechnology companies qualifies him to serve as a member of the Board.

Michael J. Higgins. Mr. Higgins was appointed Chairman of the Board in April 2020. He has been a member of the Board of Directors since June 2015. He has served as chairman of the board directors of Voyager Therapeutics., a publicly traded biopharmaceutical company, since June 2019, and served as Voyager's Interim CEO from June 2021 through March 2022. He has served as board member of Genocea Biosciences Inc., a publicly traded immuno-oncology company, from 2015 to June 2022; Nocion Therapeutics, Inc., a biopharmaceutical company, since Septemb 2020; Camp4 Therapeutics Corporation, a biopharmaceutical company, since October 2017 and KinDex Pharmaceuticals, Inc., a biotechnology company, since March 2016. Mr. Higgins is serial entrepreneur who has helped launch/build numerous companies during his career. He served as Entrepreneur-in-Residence at Polaris Partners, an investment company, from 2015 to 202 From 2003 to 2014 he served as Senior Vice President, Chief Operating Officer at Ironwood Pharmaceuticals Inc, a biopharmaceutical company. Prior to 2003, Mr. Higgins held a variety senior business positions at Genzyme Corporation, including Vice President of Corporate Finance and Vice President of Business Development. Prior to joining Genzyme Corporation, M Higgins led Procept, Inc.'s financial team from founding through its initial public offering. Mr. Higgins earned a B.S. from Cornell University and an M.B.A. from the Amos Tuck School Business Administration at Dartmouth College. We believe that Mr. Higgins' financial and business expertise, including his diversified background as an executive officer in pub pharmaceutical companies, qualifies him to serve as a member of the Board.

Anand Varadan. Mr. Varadan was appointed to serve as a director of our Company in July 2021. He is currently the founder and President of Ignition Insights, LLC, a consulting firm providi commercial and strategic consultancy services to biopharma companies and investors. Previously, he was Executive Vice President, Chief Commercial Officer at Chiasma Inc., a commercial-sta biopharmaceutical company, until its acquisition by Amryt PLC (NASDAQ: AMYT). PLC. Mr. Varadan also served as Executive Vice President, Chief Commercial Officer of Karyopha Therapeutics, Inc, (NASDAQ: KPTI) an oncology-focused pharmaceutical company, where he started up commercial operations leading to the successful launch of XPOVIO for multip myeloma. Earlier in his career, Mr. Varadan held executive leadership roles at Amgen Inc., a biopharmaceutical company, in the U.S., E.U., and Canada including Vice President, U. Inflammation and Nephrology Business Unit and Vice President and General Manager, Amgen Canada. Prior to Amgen, Mr. Varadan was a brand manager at Procter and Gamble Company. M Varadan has a B.A. from George Washington University and an M.B.A. from the Simon Business School at the University of Rochester. Mr. Varadan's extensive executive leadership experien and his in-depth knowledge of the biopharmaceutical industry make him well qualified to serve on the Board.

Corporate Governance

Pulmatrix, with the oversight of the Board and its committees, operates within a comprehensive plan of corporate governance for the purpose of defining independence, assigning responsibiliti setting high standards of professional and personal conduct and assuring compliance with such responsibilities and standards. We regularly monitor developments in the area of corpor governance.

Code of Corporate Conduct and Ethics and Whistleblower Policy

We have adopted a Code of Corporate Conduct and Ethics and Whistleblower Policy that applies to all of our associates, as well as each of our directors and certain persons performing servic for us. The Code of Corporate Conduct and Ethics and Whistleblower Policy addresses, among other things, competition and fair dealing, conflicts of interest, protection and proper use Company assets, government relations, compliance with laws, rules and regulations and the process for reporting violations of the Code of Corporate Conduct and Ethics and Whistleblow Policy, employee misconduct, improper conflicts of interest or other violations. Our Code of Corporate Conduct and Ethics and Whistleblower Policy is available on our website www.pulmatrix.com in the "Corporate Governance" section found under the "Investors" tab. We intend to disclose any amendments to, or waivers from, our Code of Corporate Conduct a Ethics and Whistleblower Policy at the same website address provided above.

Board Composition

Our Amended and Restated Certificate of Incorporation and our Restated Bylaws ("Bylaws") provide that our Board will consist of such number of directors as determined from time to time resolution adopted by our Board. Effective April 6, 2021, the size of our Board has been fixed at six directors. Subject to any rights applicable to any then outstanding shares of preferred sto any vacancies or newly created directorships resulting from an increase in the authorized number of directors may be filled by a majority of the directors then in office. Our Board is classified in three classes, with the term of office of one class expiring each year. The term of Class III I directors expires at the 2023 2024 Annual Meeting, the term of office of Class I directors expires at t Company's annual meeting of stockholders to be held in 2024 and the term of Class II directors expires at the Company's annual meeting of stockholders to be held in 2025. 2025 and the term Class III directors expires at the Company's annual meeting of stockholders to be held in 2026. Stockholders vote to elect directors of the class with a term then expiring each year at our annu meeting.

We have no formal policy regarding Board diversity. Our Board believes that each director should have a basic understanding of the principal operational and financial objectives and plans a strategies of the Company, our results of operations and financial condition and relative standing in relation to our competitors. We take into consideration the overall composition and diversity the Board and areas of expertise that director nominees may be able to offer, including business experience, knowledge, abilities and customer relationships. Generally, we will strive to assemble Board that brings to us a variety of perspectives and skills derived from business and professional experience as we may deem are in our and our stockholders' best interests. In doing so, we w also consider candidates with appropriate non-business backgrounds.

The table below provides additional diversity information regarding our directors. Each of the categories listed in the below table has the meaning as it is used in Nasdaq Listing Rule 5605(f).

Board Diversity Matrix (as of March 25, 2024)

Total number of Directors:		6		
Gender Identity:	**Female**	**Male**	**Non-Binary**	**Did Not Disclose Gender**
Directors		4		2
Demographic Background:				
African American or Black				
Alaskan Native or Native American				
Asian		1		
Hispanic or LatinX		1		
Native Hawaiian or Pacific Islander				
White		2		
Two or More Races or Ethnicities				
LGBTQ+				
Did Not Disclose Demographic Background			2	

Director Independence

We are currently listed on the NASDAQ Nasdaq Capital Market and therefore rely on the definition of independence set forth in the NASDAQ Nasdaq Listing Rules ("NASDAQ Nasdaq Rules"). Und the NASDAQ Nasdaq Rules, a director will only qualify as an "independent director" if, in the opinion of our Board, that person does not have a relationship that would interfere with the exercise independent judgment in carrying out the responsibilities of a director. Based upon information requested from and provided by each director concerning his background, employment, and affiliatio including family relationships, we have determined that Mr. Bazemore, Dr. Batycky, Dr. Cabell, Mr. Higgins, and Mr. Varadan have no material relationships with us that would interfere with t exercise of independent judgment and are "independent directors" as that term is defined in the NASDAQ Listing Nasdaq Rules.

Board Committees, Meetings and Attendance

During 2022, 2023, the Board held four six meetings. We expect our directors to attend Board meetings, meetings of any committees and subcommittees on which they serve, and each annual meeti of stockholders, either in person or by teleconference. During 2022, 2023, each director attended at least seventy-five percent (75%) of the total number of meetings held by the Board and Boa committees of which such director was a member. All six Five of our directors attended our 2022 2023 annual meeting of stockholders.

The Board delegates various responsibilities and authority to different Board committees. Committees regularly report on their activities and actions to the full Board. Currently, the Board h established an Audit Committee, a Compensation Committee and a Nominating and Corporate Governance Committee. Committee assignments are re-evaluated annually. Each of these committe operates under a charter that has been approved by our Board. The current charter of each of these committees is available on our website at *www.pulmatrix.com* in the "Corporate Governance" secti under "Investors." As of March 30, 2023, the date of this report, the following table sets forth the membership of each of the Board committees listed above.

Name	Audit Committee	Compensation Committee	Nominating and Corporate Governance Committee
Teofilo Raad			
Richard Batycky, Ph.D.	Member	Chairman	
Todd Bazemore	Member		Chairman
Christopher Cabell, M.D.		Member	Member
Michael J. Higgins*	Chairman		Member
Anand Varadan		Member	

* Chairman of the Board of Directors

Audit Committee

Our Audit Committee is responsible for, among other matters:

- approving and retaining the independent auditors to conduct the annual audit of our financial statements;
- reviewing the proposed scope and results of the audit;
- reviewing and pre-approving audit and non-audit fees and services;
- reviewing accounting and financial controls with the independent auditors and our financial and accounting staff;
- reviewing and approving transactions between us and our directors, officers and affiliates;
- recognizing and preventing prohibited non-audit services;
- establishing procedures for complaints received by us regarding accounting matters;
- overseeing internal audit functions, if any; and
- preparing the report of the audit committee that the rules of the SEC require to be included in our annual meeting proxy statement.

Our Audit Committee is composed of Michael J. Higgins (chairman), Richard Batycky, Ph.D. and Todd Bazemore. Our Board has determined that Mr. Higgins, Dr. Batycky and Mr. Bazemore we independent in accordance with NASDAQ Nasdaq Rules and Rule 10A-3 under the Securities Exchange Act of 1934, as amended (the "Exchange Act"). Our Board has also reviewed the educatio experience and other qualifications of each member of the Audit Committee. Based upon that review, our Board has determined that Michael J. Higgins qualifies as an "audit committee financ expert," as defined by the rules of the SEC. The Audit Committee met four times during 2022. 2023.

Compensation Committee

Our Compensation Committee is responsible for, among other matters:

- reviewing and recommending the compensation arrangements for management, including the compensation for our president and chief executive officer;
- appointing, compensating and overseeing the work of any compensation consultant, legal counsel or other advisor retained by the Compensation Committee;
- establishing and reviewing general compensation policies with the objective to attract and retain superior talent, to reward individual performance and to achieve our financial goals;
- administering our stock incentive plans; and
- preparing the report of the compensation committee to the extent that the rules of the SEC require such report to be included in our annual meeting proxy statement.

Our Compensation Committee is composed of Richard Batycky, Ph.D. (chairman), Christopher Cabell, M.D. and Anand Varadan. Our Board has determined that Dr. Batycky, Dr. Cabell and M Varadan were independent in accordance with NASDAQ Nasdaq Rules. The Compensation Committee has the authority to delegate to subcommittees of the Compensation Committee any of t responsibilities of the full committee. The Compensation Committee met one time two times during 2022. We 2023. The Compensation Committee did not engage any its own compensation consulta to assist in determining or recommending but did consider the amount or form analyses and recommendations of executive and director compensation during 2022. a consultant engaged management.

Nominating and Corporate Governance Committee

Our Nominating and Corporate Governance Committee is responsible for, among other matters:

- evaluating the current composition, organization and governance of the Board and its committees, and making recommendations for changes thereto;
- reviewing each director and nominee annually;
- determining desired Board member skills and attributes and conducting searches for prospective members accordingly;
- evaluating nominees, and making recommendations to the Board concerning the appointment of directors to Board committees, the selection of Board committee chairs, proposal of t slate of directors for election to the Board, and the termination of membership of individual directors in accordance with the Board's governance principles;
- overseeing the process of succession planning for the chief executive officer and, as warranted, other senior officers of the Company;
- developing, adopting and overseeing the implementation of a code of business conduct and ethics; and
- administering the annual Board performance evaluation process.

Our Nominating and Corporate Governance Committee is composed of Todd Bazemore (chairman), Christopher Cabell, M.D. and Michael J. Higgins. The Nominating and Corporate Governan Committee did not meet during 2022. 2023.

Director Nominations

Our Nominating and Corporate Governance Committee considers all qualified candidates identified by members of the Board, by senior management and by stockholders. The Nominating a Corporate Governance Committee follows the same process and uses the same criteria for evaluating candidates proposed by stockholders, members of the Board and members of senior manageme We did not pay fees to any third party to assist in the process of identifying or evaluating director candidates during 2022. 2023.

Our Bylaws contain provisions that address the process by which a stockholder may nominate an individual to stand for election to the Board at our Annual Meeting. To recommend a nominee f election to the Board, a stockholder must submit his or her recommendation to our Secretary at our corporate offices at 99 Hayden Avenue, 36 Crosby Drive, Suite 390, Lexington, 100, Bedfor Massachusetts 02421. 01730. Such nomination must satisfy the notice, information and consent requirements set forth in our Bylaws and must be received by us prior to the date set forth und "Submission of Future Stockholder Proposals" below. A stockholder's recommendation must be accompanied by the information with respect to stockholder nominees as specified in our Bylaw including among other things, the name, age, address and occupation of the recommended person, the proposing stockholder's name and address, the ownership interests of the proposing stockhold and any beneficial owner on whose behalf the nomination is being made (including the number of shares beneficially owned, any hedging, derivative, short or other economic interests and any rights vote any shares) and any material monetary or other relationships between the recommended person and the proposing stockholder and/or the beneficial owners, if any, on whose behalf the nominati is being made.

In evaluating director nominees, the Nominating and Corporate Governance Committee considers the following factors:

- the appropriate size and diversity of our Board;
- our needs with respect to the particular knowledge, skills and experience of nominees, including experience in corporate finance, technology, business, administration and sales, in light the prevailing business conditions and the knowledge, skills and experience already possessed by other members of the Board;
- experience with accounting rules and practices, and whether such a person qualifies as an "audit committee financial expert" pursuant to SEC rules; and
- balancing continuity of our Board with periodic injection of fresh perspectives provided by new Board members.

Our Board believes that each director should have a basic understanding of our principal operational and financial objectives and plans and strategies, our results of operations and financial conditi and our relative standing in relation to our competitors.

In identifying director nominees, the Board will first evaluate the current members of the Board willing to continue in service. Current members of the Board with skills and experience that are releva to our business and who are willing to continue in service will be considered for re-nomination.

If any member of the Board does not wish to continue in service or if the Board decides not to re-nominate a member for re-election, the Board will identify another nominee with the desired skills a experience described above. The Board takes into consideration the overall composition and diversity of the Board and areas of expertise that director nominees may be able to offer, including busine experience, knowledge, abilities and customer relationships. Generally, the Board will strive to assemble a Board that brings to us a variety of perspectives and skills derived from business a professional experience as it may deem are in our and our stockholders' best interests. In doing so, the Board will also consider candidates with appropriate non-business backgrounds.

Board Leadership Structure and Role in Risk Oversight

The positions of Chairman of the Board and Principal Executive Officer are filled by two separate individuals. Mr. Higgins currently serves as our Chairman of the Board, and Mr. Raad currently serv as our Principal Executive Officer. The Board acknowledges that there are different leadership structures that could allow it to effectively oversee the management of the risks relating to the Company operations and believes its current leadership structure enables it to effectively provide oversight with respect to such risks. Our Audit Committee is primarily responsible for overseeing the Company risk management processes on behalf of the full Board. The Audit Committee receives reports from management concerning the Company's assessment of risks. In addition, the Audit Committ reports regularly to the full Board, which also considers the Company's risk profile. The Audit Committee and the full Board focus on the most significant risks facing the Company and the Company general risk management strategy. In addition, as part of its oversight of our Company's executive compensation program, the Compensation Committee considers the impact of such program, and t incentives created by the compensation awards that it administers, on our Company's risk profile. In addition, the Compensation Committee reviews all of our compensation policies and procedure including the incentives that they create and factors that may reduce the likelihood of excessive risk taking, to determine whether they present a significant risk to our Company. The Compensati Committee has determined that, for all employees, our compensation programs do not encourage excessive risk and instead encourage behaviors that support sustainable value creation.

Communications with Directors

The Board welcomes communication from our stockholders. Stockholders and other interested parties who wish to communicate with a member or members of our Board or a committee thereof m do so by addressing correspondence to the Board member, members or committee, c/o Secretary, Pulmatrix, Inc., 99 Hayden Avenue, 36 Crosby Drive, Suite 390, Lexington, 100, Bedfor Massachusetts 02421. 01730. Our Secretary will review and forward correspondence to the appropriate person or persons.

All communications received as set forth in the preceding paragraph will be opened by our Secretary for the sole purpose of determining whether the contents represent a message to our directors. A contents that are not in the nature of advertising, promotions of a product or service or patently offensive material will be forwarded promptly to the addressee(s). In the case of communications to t Board or any group or committee of directors, our Secretary will make sufficient copies of the contents to send to each director who is a member of the group or committee to whom the communicati is addressed. If the amount of correspondence received through the foregoing process becomes excessive, our Board may consider approving a process for review, organization and screening of t correspondence by our Secretary or another appropriate person.

Family Relationships

There are no family relationships amongst our directors and executive officers, or person nominated or chosen by the Company to become a director or executive officer.

Involvement in Certain Legal Proceedings

There have been no material legal proceedings that would require disclosure under the federal securities laws that are material to an evaluation of the ability or integrity of our directors or executi officers, or in which any director, officer, nominee or principal stockholder, or any affiliate thereof, is a party adverse to us or has a material interest adverse to us.

Insider Trading Policy and Anti-Hedging Policy

We maintain an insider trading policy that applies to our officers and directors that prohibits trading our securities during certain established periods and when in possession of material non-pub information. It also prohibits, unless approved in advance in limited circumstances by the policy administrator, the hedging of our securities, including short sales or purchases or sales of derivati securities based on our securities, and the use of our securities to secure a margin or other loan. Since the adoption of our insider trading policy, the policy administrator has not granted any su exemptions to the policy's general prohibition on hedging or pledging.

ITEM 11. EXECUTIVE COMPENSATION

Executive Summary

This section discusses the material components of our executive compensation program. We comply with the executive compensation disclosure rules applicable to "smaller reporting companies," such term is defined in the rules promulgated under the Securities Act, which require compensation disclosure for (i) our principal executive officer; (ii) the two most highly compensated executi officers other than our principal executive officer; and (iii) up to two additional individuals for whom disclosure would have been provided pursuant to clause (ii) but for the fact that the individual w not serving as an executive officer at the end of 2022. 2023. These current officers are referred to as our Named Executive Officers.

Summary Compensation Table

The following table sets forth information concerning the compensation of our Named Executive Officers for the years ended December 31, 2022 December 31, 2023 and 2021. 2022.

Name and Principal Position	*Year*	*Salary ($)*	*Bonus ($)*	*Option Awards ($)*[1]	*Non-Equity Incentive Plan Compensation ($)*	*All Other Compensation ($)*	*Total ($)*	*Year*	*Salary ($)*	*Bonus ($)*	*Option Awards ($)*[1]	*Non-Equity Incentive Plan Compensation ($)*	*All Other Compensation ($)*	*Total ($)*
Teofilo Raad	*2022*	*525,272*	*-*	*234,375*	*237,003*	*10,422*[2]	*1,007,072*	*2023*	*567,294*	*-*	*114,172*	*-*	*10,422*[2]	*691,88*
(Chief Executive Officer)	*2021*	*479,723*	*-*	*668,448*	*223,061*	*10,722*[3]	*1,381,954*	*2022*	*525,272*	*-*	*234,375*	*237,003*	*10,422*[3]	*1,007,07*
Peter Ludlum[8]	*2022*	*-*	*-*	*-*	*-*	*398,583*[4]	*398,583*	*2023*	*-*	*-*	*-*	*-*	*510,224*[4]	*510,22*
(Interim Chief Financial Officer)	*2021*	*-*	*-*	*-*	*-*	*-*	*-*	*2022*	*-*	*-*	*-*	*-*	*398,583*[4]	*398,58*
Margaret Wasilewski, M.D.[9]	*2022*	*368,333*	*-*	*101,882*	*133,755*	*10,085*[5]	*614,055*	*2023*	*461,890*	*-*	*37,294*	*-*	*10,422*[2]	*509,60*
(Chief Medical Officer)	*2021*	*-*	*-*	*-*	*-*	*-*	*-*	*2022*	*368,333*	*-*	*101,882*	*133,755*	*10,085*[5]	*614,05*
Michelle S. Siegert (7)	*2022*	*299,700*	*43,035*[6]	*57,594*	*81,135*	*10,422*[2]	*491,886*	*2023*	*-*	*-*	*-*	*-*	*-*	
(Vice President, Finance)	*2021*	*286,902*	*2,000*[7]	*108,610*	*72,041*	*10,722*[3]	*480,275*	*2022*	*299,700*	*43,035*[6]	*57,594*	*81,135*	*10,422*[3]	*491,88*

(1) In accordance with SEC rules, this column reflects the aggregate fair value of the option awards granted during the respective fiscal year computed as of their respective grant dates in accordan with Financial Accounting Standard Board Accounting Standards Codification Topic 718 for share-based compensation transactions. The assumptions made in the valuation of the share-bas payments are contained in Note 10 9 to our consolidated financial statements for the fiscal year ended December 31, 2022 December 31, 2023 in our Annual Report on Form 10-K for the ye ended December 31, 2022 December 31, 2023.

(2) Represents Company 401(k) plan contributions of $9,900 and payment made by the Company for life, AD&D and LTD premiums in the amount of $522.

(3) Represents Company 401(k) plan contributions of $9,150, payment made by the Company for life, AD&D and LTD premiums in the amount of $522 and cell phone reimbursement of $750.

(3) Represents Company 401(k) plan contributions of $8,700, payment made by the Company for life, AD&D and LTD premiums in the amount of $522 and cell phone reimbursement of $1,500.

(4) The amount shown in the "All Other Compensation" column for Mr. Ludlum includes fees paid to Danforth Advisors, LLC on his behalf during the year years ended December 3 2022. December 31, 2023 and 2022.

(5) Represents Company 401(k) plan contributions of $9,150, payment made by the Company for life, AD&D and LTD premiums in the amount of $435 and cell phone reimbursement of $500.

(6) Represents a retention bonus which was paid on March 31, 2022.

(7) Represents a spot bonus which As of April 18, 2022, Michelle S. Siegert no longer served as the Principal Accounting Officer and the Principal Financial Officer. Ms. Siegert was paid on Februa 26, 2021 terminated effective July 31, 2023.

(8) Peter Ludlum was appointed as our Interim Chief Financial Officer in April 2022.

(9) Margaret Wasilewski, M.D. was appointed as our Chief Medical Officer in March 2022. On March 7, 2024, the Board approved the termination of Dr. Wasilewski.

Narrative Disclosure to Summary Compensation Table

Executive Employment Agreements

We have entered into executive employment agreements with each of our Named Executive Officers. The executive employment agreements provide for “at will” employment and set forth the terr and conditions of employment, including annual base salary, discretionary bonus opportunities, benefits and eligibility to participate in our employee benefit plans and programs. As a condition of the employment, our Named Executive Officers were each required to execute our standard proprietary information, inventions, and non-competition agreement. The material terms of these executi employment agreements are summarized below.

Retirement Plans

As part of our overall compensation program, we provide all full-time employees, including our named executive officers, with the opportunity to participate in a defined contribution 401(k) plan. C 401(k) plan is intended to qualify under Section 401 of the Internal Revenue Code so that employee pre-tax contributions and income earned on such contributions are not taxable to employees un withdrawn. Employees may elect to defer up to 100 percent of their eligible compensation (not to exceed the statutorily prescribed annual limit) in the form of elective deferral contributions to o 401(k) plan. Our 401(k) plan also has a “catch-up contribution” feature for employees aged 50 or older (including those who qualify as “highly compensated” employees) who can defer amounts ov the statutory limit that applies to all other employees.

Employee Benefits and Perquisites

During their employment, Mr. Raad, Ms. Siegert, and Dr. Wasilewski are eligible to participate in our health and welfare plans, including medical and dental benefits, short-term and long-ter disability insurance, and life insurance.

No Tax Gross-Ups

We do not make gross-up payments to cover our executives’ personal income taxes that may pertain to any of the compensation or perquisites paid or provided by us.

Mr. Raad

On May 16, 2019, the Board appointed Mr. Raad to serve as Chief Executive Officer and a Class II director. Prior to Mr. Raad's appointment as the Chief Executive Officer, Mr. Raad served as o Chief Business Officer pursuant to an employment agreement, dated April 28, 2017. On June 28, 2019, we and Mr. Raad entered into an amended and restated employment agreement (the "Ra Agreement"), with Mr. Raad to serve as our President and Chief Executive Officer. Mr. Raad's employment with us is "at-will," and the Raad Agreement does not include a specified term. consideration for his services as Chief Executive Officer, the Raad Agreement provided that Mr. Raad would receive (i) an annual base salary of $450,000 and (ii) a target annual cash bonus equal 45% of his base salary. Both Mr. Raad's salary and bonus are subject to review and adjustment by the Board or an appropriate committee thereof. The actual bonus amount is based on both t Company's, our and Mr. Raad's individual performance during the year. Effective as of January 1, 2022, after taking into consideration previous increases, Mr. Raad's base salary was increased $525,272 and the target annual cash bonus equaled 50% of the base salary. Effective as of January 1, 2023, Mr. Raad's base salary was increased to $567,294 and the target annual cash bonus remain at 50% of the base salary. No incentive bonus was paid to Mr. Raad for the year ended December 31, 2023. Effective January 6, 2024, Mr. Raad was granted a Retention Bonus (defined below) totali $340,000 payable in two equal installments following each of the first two calendar quarters in 2024.

We initially agreed in the Raad Agreement to grant Mr. Raad an option to purchase 6,831 shares of our common stock, subject to the terms and conditions of the Amended and Restated 2013 Employe Director and Consultant Equity Incentive Plan (the "Incentive Plan") and our standard form of stock option agreement, as soon as practicable upon execution of the Raad Agreement. On January 2020, after taking into consideration the results of a compensation survey, the Compensation Committee of the Board made various compensation adjustments, which included a grant to Mr. Raad, lieu of the option to purchase 6,831 shares of our commons stock, of (i) an option to purchase 23,572 shares, of which 3,437 optioned shares were fully vested and exercisable as of January 9, 2020, a the remaining optioned shares to vest and become exercisable in 41 equal monthly installments on the 16th day of each of the 41 calendar months following January 2020, and (ii) an option to purcha 39,089 shares of common stock, 1/48th of the optioned shares to vest and become exercisable on each of the 48 monthly anniversaries of January 9, 2020. On April 2, 2020, Mr. Raad was granted option to purchase 499 shares of common stock, 1/48th of the optioned shares to vest and become exercisable on each of the 48 monthly anniversaries of April 2, 2020.
On January 28, 2021, Mr. Raad was granted an option to purchase 28,274 shares of common stock, with 2.08333% of the optioned shares to vest and become exercisable on each of the 48 month anniversaries of grant date. On January 27, 2022, Mr. Raad was granted an option to purchase 37,500 shares of common stock, with 2.08333% of the optioned shares to vest and become exercisable each of the 48 monthly anniversaries of grant date. On January 26, 2023, Mr. Raad was granted an option to purchase 34,900 shares of common stock, with 2.08333% of the optioned shares to vest a become exercisable on each of the 48 monthly anniversaries of grant date.

Termination Benefits

Pursuant to the Raad Agreement, if Mr. Raad's employment is terminated (i) by us without cause Cause (as defined in the Raad Agreement) or (ii) by Mr. Raad for good reason, then the Company must pay Mr. Raad, in addition to any then-accrued and unpaid obligations owed to him, (a) twelve (12) months of his then-current base salary, (b) a pro-rated bonus in an amount equal to the target annual performance bonus to which Mr. Raad may have been entitled for the year in which the termination occurs, (c) a separation bonus equal to one hundred percent (100%) of the target annual performance bonus to which Mr. Raad may have been entitled for the year in which the termination occurs, and (d) up to twelve (12) months of COBRA health insurance premiums at the Company's our then-normal rate of contribution. In addition, all unvested equity awards held by Mr. Raad that would have vested during the twelve (12) months following the termination date will immediately vest and become exercisable. If Mr. Raad's employment is terminated (i) by the Company us without cause Cause or (ii) by Mr. Raad for good reason, within twelve (12) months following a change in control, then Mr. Raad shall be entitled to receive, in addition to any then-accrued and unpaid obligations owed to him, (a) a lump sum payment equal to eighteen (18) months of his then-current base salary, (b) a pro-rated bonus in an amount equal to the target annual performance bonus to which Mr. Raad may have been entitled for the year in which the termination occurs, (c) a separation bonus equal to one hundred percent (100%) of the target annual performance bonus to which Mr. Raad may have been entitled for the year in which the termination occurs, and (d) up to twelve (12) months of COBRA health insurance premiums at the Company's our then-normal rate of contribution. In addition, in that case, all unvested equity awards will immediately vest and become exercisable. Receipt of Mr. Raad's severance and other termination benefits is subject to his execution of a release of claims and his compliance with the restrictive covenants contained in his agreements with the Company.

Under Mr. Raad's employment agreement, "good reason" is defined as (i) relocation of Mr. Raad's principal business location to a location more than fifty (50) miles from his then-current business location; (ii) a material diminution in Mr. Raad's duties, authority, responsibilities, or reporting lines in a manner whereby Mr. Raad no longer reports to the Board; or (iii) a material reduction in Mr. Raad's base salary; provided that (A) Mr. Raad provides the Company with written notice that he intends to terminate his employment for good reason within thirty (30) days of such circumstance occurring, (B) if such circumstance is capable of being cured, the Company has we have failed to cure such circumstance within a period of thirty (30) days from the date of such written notice, and (C) Mr. Raad terminates his employment within sixty five (65) days from the date that good reason first occurs.

Retention Bonus and Letter Agreement

On January 6, 2024, we and Mr. Raad entered into a letter agreement (the "Letter Agreement"), pursuant to which Mr. Raad shall be granted a retention bonus of $170,000 per quarter, for each of t full calendar quarters ending March 31, 2024 and June 30, 2024, respectively, less applicable payroll and other tax withholdings (such bonus, the "Retention Bonus"). Pursuant to the Letter Agreeme Mr. Raad must be employed by us on the last day of such applicable calendar quarter unless Mr. Raad's employment is terminated on the closing date of a potential acquisition of us by an unrelat third party, merger by us with or into an unrelated third party or other liquidation event (such closing date, the "Retention Date"), in which case, Mr. Raad shall receive the full Retention Bonus for t calendar quarter in which the Retention Date occurs.

Notwithstanding the foregoing, if Mr. Raad's employment with us is terminated by us without Cause prior to the Retention Date, or due to death or disability, then we shall pay to Mr. Raad the fu Retention Bonus with respect to the calendar quarter of such termination, subject to the receipt of a release of claims by us (the "Release"). We shall not be obligated to pay the Retention Bonus if Mr. Raad terminates his employment with us prior to the Retention Date, (ii) we terminate Mr. Raad's employment prior to the Retention Date for Cause, or (iii) Mr. Raad's employment is terminat due to his death, disability or by us without Cause, and a Release has not been received.

Mr. Ludlum

On April 14, 2022, the Company we appointed Peter Ludlum as Interim Chief Financial Officer, effective as of April 18, 2022. Since December 2021, Mr. Ludlum has served as a consultant wi Danforth Advisors, LLC ("Danforth"), a provider of strategic and operational finance and accounting for life science companies, and, since December 2021, Mr. Ludlum has served as t Company's our Strategic Advisor – Finance pursuant to a November 30, 2021 consulting agreement (the "Consulting Agreement") between the Company and Danforth.

Pursuant to the Consulting Agreement, Danforth will receive cash compensation at a rate of $400 per hour for Mr. Ludlum's services. Each month Danforth we and the Company Danforth shall evalua jointly the current fee structure and scope of Services. Danforth reserves the right to an annual increase in consultant rates of up to 4%, effective January 1 of each year. Upon termination of t Consulting Agreement, no compensation or benefits of any kind shall be payable or issuable to Danforth after the effective date of such termination. In addition, the Company we will reimbur Danforth for reasonable out-of-pocket business expenses, including but not limited to travel and parking, incurred by Danforth in performing the services, upon submission by Danforth of supporti documentation reasonably acceptable to the Company. us. Any such accrued expenses in any given three (3) month period that exceed $1,000 shall be submitted to the Company us for its our pri written approval.

Pursuant to the Consulting Agreement, Mr. Ludlum will provide services to the Company us under the Consulting Agreement as an independent contractor and employee of Danforth. The term of t Consulting Agreement will continue until such time as either party has given notice of termination. The Consulting Agreement may be terminated by either party hereto: (a) with cause (as defined the Consulting Agreement) upon written notice to the other party; or (b) without cause upon 30 days prior written notice to the other party.

Ms.
Dr. Wasilewski M.D.

On March 1, 2022, the Company we appointed Dr. Wasilewski to serve as Chief Medical Officer. Dr. Wasilewski's employment with us is "at-will," pursuant to an employment agreement (t "Wasilewski Agreement"). As consideration for her services as Chief Medical Officer, the Wasilewski Agreement provided that Dr. Wasilewski would receive (i) an annual base salary of $442,000 a (ii) a target annual cash bonus equal to 40% of her base salary. Both Dr. Wasilewski's salary and bonus are subject to review and adjustment by the Board or an appropriate committee thereof. T actual bonus amount is based on both the Company's, our and Dr. Wasilewski's individual performance during the year.

We agreed in Pursuant to the Wasilewski Agreement, we agreed to grant Dr. Wasilewski an option to purchase 21,060 shares of our common stock, subject to the terms and conditions of the Incenti Plan and our standard form of stock option agreement, as soon as practicable upon execution of the Wasilewski Agreement. Effective January 1, 2023, Dr. Wasilewski's base salary was increased $461,890 and the target annual cash bonus remained at 40% of the base salary. No incentive bonus was paid to Dr. Wasilewski for the year ended December 31, 2023. On March 7, 2024, the Boa approved the termination of Dr. Wasilewski. Termination benefits to be provided to Dr. Wasilewski are described below.

Termination Benefits

Pursuant to the Wasilewski Agreement, if Dr. Wasilewski's employment is terminated (i) by us other than cause or (ii) by Dr. Wasilewski for good reason, then the Company we must pay I Wasilewski, in addition to any then-accrued and unpaid obligations owed to her, the following (i) severance in the amount equal to six (6) months of her base salary, less all customary and requir taxes and employment-related deductions, paid in equal installments commencing on the first payroll date following the date on which the release of claims referenced above becomes effective a non-revocable, provided that, if the release consideration period plus the revocation period spans two taxable years, payments will commence in the later taxable year; (ii) payment for any approve but unpaid bonus for the year immediately preceding the year her employment terminates, less all customary and required taxes and employment-related deductions; (iii) payment of a pro-rated bon in an amount equal to her target bonus to which she may have been entitled for the year in which her employment terminates, less all customary and required taxes and employment-related deductior (iv) up to twelve (12) months of COBRA health insurance premiums at the Company's our then-normal rate of contribution. and (v) she shall become fully vested in any and all equity awar outstanding as of the date of her termination.

In the event that a change of control occurs and within a period of one (1) year following the change of control, either her employment is terminated by the Company us other than for cause or s terminates her employment for good reason, in exchange for her execution and non-revocation of a release of claims, she shall receive the payments and benefits set forth above, provided that t severance shall be for twelve (12) months (rather than six (6) months).

Ms. Siegert

On Ms. Siegert was terminated effective July 31, 2023. Previously, on November 13, 2019, the Board had appointed Ms. Siegert to serve as Vice President, Finance, and as the our Principal Accounti Officer and the Principal Financial Officer, of the Company, effective as of November 16, 2019. As of April 18, 2022, Ms. Siegert no longer serves served as the Principal Accounting Officer and t Principal Financial Officer. Ms. Siegert's employment with us is was "at-will" with no specified term, subject to an offer letter dated November 7, 2019 (the "Offer Letter"). As consideration for h services as Vice President, Finance, the Offer Letter provided that Ms. Siegert would receive (i) an annual base salary of $240,000 and (ii) a target annual cash bonus equal to 25% of her base salary, be determined by the Chief Executive Officer at his or her sole discretion. Both Ms. Siegert's salary and bonus are subject to review and adjustment by the Board or an appropriate committee there The actual bonus amount is based on both the Company's, our and Ms. Siegert's individual performance during the year. Effective January 1, 2022, after taking into consideration previous increase Ms. Siegert's base salary was increased to $299,700 and the target annual cash bonus equaled 30% of the base salary. Effective January 1, 2023, Ms. Siegert's base salary was increased to $313,187 a the target annual cash bonus remained at 30% of the base salary.

Termination Benefits

In the event that a change of control occurs and within a period of one (1) year following the change of control, if Ms. Siegert's employment is terminated other than for cause, or if Ms. Sieg terminates her employment for good reason, Ms. Siegert would receive (a) a lump sum amount equal to six (6) times the sum of her monthly base salary plus the monthly COBRA premium for hea care insurance at the time of termination, and (b) all equity awards outstanding shall become fully vested as of the date of termination.

Outstanding Equity Awards at Fiscal Year-End

The following table sets forth information concerning the outstanding equity awards that have been previously awarded to each of our Named Executive Officers and which remain outstanding as December 31, 2022 December 31, 2023:

Name	*Number of securities underlying unexercised options (#) exercisable*	*Number of securities underlying unexercised options (#) unexercisable*	*Option exercise price ($)*	*Option expiration date*	*Number of securities underlying unexercised options (#) exercisable*	*Number of securities underlying unexercised options (#) unexercisable*	*Option exercise price ($)*	*Option expiratio date*
Teofilo Raad	***1,651***	***—***	***540.00***	***05/01/2027***	***1,651***	***—***	***540.00***	***05/01/20***
	3,704	***—***	***93.60***	***06/05/2028***	***3,704***	***—***	***93.60***	***06/05/20***
	14,330 (1)	***1,669***	***21.20***	***05/16/2029***	***15,999***	***—***	***21.20***	***05/16/20***
	28,501 (1)	***10,588***	***30.80***	***01/09/2030***	***23,572***	***—***	***30.80***	***01/09/20***
	21,115 (1)	***2,457***	***30.80***	***01/09/2030***	***38,269 (1)***	***820***	***30.80***	***01/09/20***
	338 (1)	***161***	***25.60***	***04/02/2030***	***458 (1)***	***41***	***25.60***	***04/02/20***
	13,547 (1)	***14,727***	***29.40***	***01/28/2031***	***20,615 (1)***	***7,659***	***29.40***	***01/28/20***
	9,377 (1)	***28,123***	***7.41***	***01/27/2032***	***18,749 (1)***	***18,751***	***7.41***	***01/27/20***
					8,724 (1)	***26,176***	***3.99***	***01/26/20***
Margaret Wasilewski, M.D.	***—***	***21,060 (2)***	***5.72***	***03/01/2032***	***9,213 (2)***	***11,847***	***5.72***	***03/01/20***
Michelle S. Siegert	***15***	***—***	***376.00***	***10/11/2023***				
	54	***—***	***2,360.00***	***06/16/2025***	***2,850 (1)***	***8,550***	***3.99***	***01/26/20***
	8	***—***	***2,200.00***	***06/24/2025***				
	75	***—***	***1,182.00***	***08/13/2025***				
	66	***—***	***560.00***	***02/03/2026***				
	33	***—***	***556.00***	***03/20/2027***				
	904	***—***	***93.60***	***06/05/2028***				
	1,120 (1)	***130***	***21.20***	***05/16/2029***				
	5,616 (1)	***2,083***	***30.80***	***01/09/2030***				
	2,486 (1)	***739***	***30.80***	***01/09/2030***				
	2,206 (1)	***2,388***	***29.40***	***01/28/2031***				
	2,304 (1)	***6,911***	***7.41***	***01/27/2032***				

(1) Each of these options vests over a four (4) year period, with 2.08333% vesting on each monthly anniversary subsequent to the date of grant for a total of forty-eight (48) months.

(2) This option award vests over a four (4) year period, with 25% vesting on the first anniversary and 2.08333% vesting on the last day of each of the subsequent thirty-six 36 months.

Compensation Recovery Policy

In November 2023, our board of directors approved a Compensation Recovery Policy, which states that in the event we are required to prepare an accounting restatement, then we are directed, to t fullest extent permitted by governing law, to recover from each executive officer the amount, if any, of previously awarded compensation that has been determined to be erroneously awarded. Th policy applies to incentive-based compensation received by executive officers on or after October 2, 2023.

Director Compensation

We have entered into a director's agreement with each of our non-employee directors. In 2022, 2023, under these agreements, non-employee directors were paid cash compensation payable in fo quarterly payments as set forth in the table below.

	Annual Retainer Non-Employee Directors
Board of Directors:	
Members	$ 35,000
Chairperson	$ 65,000
Audit Committee:	
Members	$ 7,500
Chairperson	$ 15,000
Compensation Committee:	
Members	$ 5,000
Chairperson	$ 11,500
Nominating and Corporate Governance Committee:	
Members	$ 5,000
Chairperson	$ 10,000

The agreements also provide that such directors will be reimbursed for reasonable out-of-pocket expenses incurred in connection with the attendance of board and committee meetings.

Director Compensation Table

The following table presents the total compensation for each person who served as a member of our Board during 2022. 2023. Other than as set forth in the table and described more fully below, we d not pay any compensation, reimburse any expense of, make any equity awards or non-equity awards to, or pay any other compensation to any of the other members of our Board in such period. M Raad receives no additional compensation for his service as a director, and, consequently, is not included in this table. The compensation received by Mr. Raad as our President and Chief Executi Officer for 2022 2023 is set forth in the "Summary Compensation Table" under the section "Executive Compensation".

Name	*Fees earned or paid in cash ($)*	*Option awards (1)(2) ($)*	*Total ($)*	*Fees earned or paid in cash ($)*	*Option awards (1)(2) ($)*	*Total ($)*
Richard Batycky, Ph.D.	***54,000***	***6,906***	***60,906***	***54,000***	***5,561***	***59,56***
Todd Bazemore	***52,500***	***6,906***	***59,406***	***52,500***	***5,561***	***58,06***
Christopher Cabell, M.D.	***45,000***	***6,906***	***51,906***	***45,000***	***5,561***	***50,56***
Michael J. Higgins	***85,000***	***11,525***	***96,525***	***85,000***	***7,969***	***92,96***
Anand Varadan	***40,000***	***6,906***	***46,906***	***40,000***	***5,561***	***45,56***

(1) In accordance with SEC rules, this column reflects the aggregate fair value of option awards granted during the fiscal year ended December 31, 2022 December 31, 2023, computed as of the respective grant dates in accordance with Financial Accounting Standard Board Accounting Standards Codification Topic 718 for share-based compensation transactions. The assumptio made in the valuation of the share-based payments are contained in Note 10 9 to our consolidated financial statements, found elsewhere in this report.

(2) As of December 31, 2022 December 31, 2023, our non-employee directors held the following aggregate number of options to purchase shares of our common stock: Dr. Batycky, 3,855 5,5 options; Mr. Bazemore, 3,355 5,055 options; Dr. Cabell, 3,355 5,055 options; Mr. Higgins, 6,715 9,151 options; and Mr. Varadan, 2,605 4,305 options.

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

The following table sets forth information regarding the beneficial ownership of our common stock as of March 27, 2023 March 25, 2024 by (i) each person known to us to beneficially own five perce (5%) or more of our common stock, (ii) each director and Named Executive Officer (as defined below) and (iii) all of our directors and executive officers as a group. The persons named in the tab have sole voting and investment power with respect to all shares of common stock owned by them and have an address of c/o Pulmatrix Inc., 99 Hayden Avenue, 36 Crosby Drive, Suite 39 Lexington, 100, Bedford, MA 02421, 01730, unless otherwise noted. Percentage of ownership is based on 3,652,285 shares of common stock issued and outstanding as of March 27, 2023 March 2 2024.

Beneficial ownership is determined in accordance with the rules of the SEC. For the purpose of calculating the number of shares beneficially owned by a stockholder and the percentage ownership that stockholder, shares of common stock subject to options or warrants that are currently exercisable or exercisable within sixty (60) days of March 27, 2023 March 25, 2024 by that stockholder a deemed outstanding.

Name	Number of Shares Beneficially Owned	Percentage of Shares outstanding[1]	Beneficially Owned as a result of stock ownership	Beneficially Owned as a result of stock option ownership	Beneficially Owned as a result of warrant ownership
Named Executive Officers and Directors					
Richard Batycky, Ph.D.	2,705	*	25	2,680	-
Todd Bazemore	1,920	*	-	1,920	-
Christopher Cabell M.D.	2,044	*	-	2,044	-
Michael J. Higgins	4,808	*	-	4,808	-
Anand Varadan	1,209	*	-	1,209	-
Teofilo Raad	109,924	2.92%	-	109,924	-
Peter Ludlum	-	*	-	-	-
Margaret Wasilewski, M.D.	6,891	*	-	6,891	-
Michelle S. Siegert	18,395	*	60	18,335	-
All directors and executive officers as a group of nine persons	147,896	3.89%	85	147,811	-
5% Stockholders					
Sabby Volatility Warrant Master Fund, Ltd[2] c/o Ogier Fiduciary Services (Cayman) Limited 89 Nexus Way, Camana Bay, Grand Cayman KY1-9007 Cayman Islands	301,938	8.27%	301,938	-	-

Name	Number of Shares Beneficially Owned	Percentage of Shares outstanding[1]	Beneficially Owned as a result of stock ownership	Beneficially Owned as a result of stock option ownership	Beneficially Owned as a result of warrant ownership
Named Executive Officers and Directors					
Richard Batycky, Ph.D.	3,852	*	25	3,827	-
Todd Bazemore	3,141	*	-	3,141	-
Christopher Cabell M.D.	3,265	*	-	3,265	-
Michael J. Higgins	6,531	*	-	6,531	-
Anand Varadan	2,247	*	-	2,247	-
Teofilo Raad	140,988	3.72%	-	140,988	-
Peter Ludlum	-	*	-	-	-
Margaret Wasilewski, M.D.	14,767	*	-	14,767	-
All directors and executive officers as a group of eight persons	174,791	4.57%	25	174,766	-
5% Stockholders					
Sabby Volatility Warrant Master Fund, Ltd[2] c/o Ogier Fiduciary Services (Cayman) Limited 89 Nexus Way, Camana Bay, Grand Cayman KY1-9007 Cayman Islands	182,249	4.99%	182,249	-	-

* Less than 1%.

(1) Beneficial ownership as reported in the above table has been determined in accordance with Rule 13d-3 promulgated under the Exchange Act and is not necessarily indicative of benefici ownership for any other purpose. The number of shares of common stock shown as beneficially owned in column one includes shares of common stock issuable upon the conversion of series convertible preferred stock and the exercise of stock options and warrants that are currently exercisable or will become exercisable within sixty (60) days of March 27, 2023 March 25, 2024.

(2) This information is based on the information reported on the Schedule 13G filed on January 10, 2023 January 2, 2024 by Sabby Volatility Warrant Master Fund, Ltd., Sabby Management, LL and Hal Mintz, and other information available to the Company. Sabby Volatility Warrant Master Fund, Ltd ("Sabby") is the beneficial owner of 301,938 182,249 shares of common stock. As March 27, 2023 March 25, 2024, Sabby owns warrants that would be exercisable up to 260,411 248,409 additional shares of common stock, except for a limitation set forth in the warra agreements that restricts Sabby's ability to exercise the warrants if such exercise would result in Sabby Volatility Warrant Master Fund, Ltd owning more than 4.99% of the Company's current outstanding number of shares of common stock. The principal address of Sabby is 89 Nexus Way, Camana Bay, Grand Cayman KY1-9007 Cayman Islands.

Equity Compensation Plan Information

The following table provides information regarding the number of securities to be issued under the Incentive Plan, the 2013 Employee, Director and Consultant Equity Incentive Plan (the "Origi 2013 Plan") and the 2003 Employee, Director, and Consultant Stock Plan (the "2003 Plan"), the weighted-average exercise price of options issued under the Incentive Plan, Original 2013 Plan and t 2003 Plan, and the number of securities remaining available for future issuance under the Incentive Plan, the Original 2013 Plan and the 2003 Plan, in each case as of December 31, 2022 December 3 2023:

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans[3]
Equity compensation plans approved by security holders[1]	304,823	$ 28.66	145,735
Equity compensation plans not approved by security holders[2]	—	—	—
Total	304,823	$ 28.66	145,735

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans[3]
Equity compensation plans approved by security holders[1]	344,306	$ 20.92	288,186
Equity compensation plans not approved by security holders[2]	—	—	—
Total	344,306	$ 20.92	288,186

(1) Represents shares available for issuance under the Incentive Plan.

(2) Excludes 638 shares of our common stock issuable upon outstanding options granted under equity compensation plans granted under the Original 2013 Plan and the 2003 Plan. No addition awards may be issued under the Original 2013 Plan nor the 2003 Plan. As of December 31, 2022 December 31, 2023, there were 328 options with a weighted average exercise price $367.69 $3.40 per share outstanding pursuant to the Original 2013 Plan. As of December 31, 2022, there was 1 option with a weighted average exercise price of $376.00 per share Plan and options outstanding pursuant to the 2003 Plan.

(3) The number of authorized shares under the Incentive Plan is subject to annual increases based upon an "evergreen" provision, which allows for an annual increase in the number of shares of o common stock available for issuance under the plan on the first day of each fiscal year. Pursuant to the "evergreen" provision currently in effect, the annual increase in the number of shares sha be equal to five percent (5%) of the number of shares of our common stock outstanding as of such date.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

Transactions with related persons are governed by our Code of Corporate Conduct and Ethics and Whistleblower Policy, which applies to all of our associates, as well as each of our directors a certain persons performing services for us. This code covers a wide range of potential activities, including, among others, conflicts of interest, self-dealing and related party transactions. Waiver of t policies set forth in this code will only be permitted when circumstances warrant. Such waivers for directors and executive officers, or that provide a benefit to a director or executive officer, may made only by our Board, as a whole, or the Audit Committee and must be promptly disclosed as required by applicable law or regulation. Absent such a review and approval process in conformity wi the applicable guidelines relating to the particular transaction under consideration, such arrangements are not permitted. All related party transactions for which disclosure is required to be provid herein were approved in accordance with our Code of Corporate Conduct and Ethics and Whistleblower Policy.

During the period since January 1, 2021 Since January 1, 2022, there were no transactions with related persons. As of March 30, 2023, there are no nor proposed transactions with related perso outside the normal course of business in which any related person has or will have a direct or indirect material interest involving an amount that exceeds the lesser of $120,000 or one percent (1%) the average of the Company's total assets as of the end of last two completed fiscal years. A related person is any executive officer, director, nominee for director, or holder of 5% or more of t Company's common stock, or an immediate family member of any of those persons.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

Fees to Independent Registered Public Accounting Firm

The following is a summary of the fees billed to us by Marcum LLP for professional services rendered in the years ended December 31, 2022 December 31, 2023 and 2021: 2022:

	2022	2021	*2023*	*2022*
Audit Fees	$ 238,885	$ 186,121	***$ 272,926***	***$ 238,88***
Audit-Related Fees	—	42,744	—	–
Tax Fees	—	—	—	–
All Other Fees	—	—	—	–
Total Fees	$ 238,885	$ 228,865	***$ 272,926***	***$ 238,88***

Audit Fees. This category includes the audit of our annual consolidated financial statements, reviews of our interim financial statements included in our Form 10-Qs and services that are normal provided by our independent registered public accounting firm in connection with its engagements for those years. This category also includes advice on audit and accounting matters that arose durin or as a result of, the audit or the review of our unaudited interim financial statements.

Audit-Related Fees. This category consists of assurance and related services by our independent registered public accounting firm that are reasonably related to the performance of the audit or review our financial statements and are not reported above under "Audit Fees." The services for the fees disclosed under this category include consents regarding equity issuances.
Tax Fees. This category typically consists of professional services rendered by our independent registered public accounting firm for tax compliance and tax advice.
All Other Fees. This category includes aggregate fees billed in each of the last two fiscal years for products and services provided by the Marcum LLP, other than the services reported in the categori above.

Pre-Approval Policies and Procedures

Under the Audit Committee's pre-approval policies and procedures, the Audit Committee is required to pre-approve the audit and non-audit services performed by our independent registered pub accounting firm. On an annual basis, the Audit Committee pre-approves a list of services that may be provided by the independent registered public accounting firm without obtaining specific pr approval from the Audit Committee. In addition, the Audit Committee sets pre-approved fee levels for each of the listed services. Any type of service that is not included on the list of pre-approv services must be specifically approved by the Audit Committee or its designee. Any proposed service that is included on the list of pre-approved services but will cause the pre-approved fee level to exceeded will also require specific pre-approval by the Audit Committee or its designee.

The Audit Committee has delegated pre-approval authority to the Audit Committee chairman and any pre-approved actions by the Audit Committee chairman as designee are reported to the Au Committee for approval at its next scheduled meeting.

All of the services rendered by Marcum LLP in 2022 2023 were pre-approved by the Audit Committee.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES.

(a) The following documents are filed as part of this Annual Report on Form 10-K:

(1) Consolidated Financial Statements:

(2) Financial Statement Schedules:

None. Financial statement schedules have not been included because they are not applicable, or the information is included in the consolidated financial statements or notes thereto.

(3) Exhibits:

See "Index to Exhibits" for a description of our exhibits.

ITEM 16. FORM 10-K SUMMARY

Not applicable.

INDEX TO EXHIBITS

Exhibit Number	Exhibit Description	Filed with this Report	Incorporated by Reference herein from Form or Schedule	Filing Date	SEC File/Reg. Number
1.1	At the Market Offering Agreement, dated May 26, 2021, by and between Pulmatrix, Inc. and H.C. Wainwright & Co., LLC		Form S-3 (Exhibit 1.2)	05/26/21	333-25650
3.1	Amended and Restated Certificate of Incorporation of Pulmatrix, Inc., as amended through June 15, 2015		Form 10-Q (Exhibit 3.1)	08/14/15	001-3619
3.2	Restated Bylaws of Pulmatrix, Inc., as amended through June 15, 2015		Form 10-Q (Exhibit 3.2)	08/14/15	001-3619
3.3	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Pulmatrix, Inc., dated as of June 5, 2018		Form 8-K (Exhibit 3.1)	06/07/18	001-3619
3.4	Form of Certificate of Designation of Preferences, Rights and Limitations of Series A Convertible Preferred Stock.		Form 8-K/A (Exhibit 3.1)	12/17/21	001-3619
3.5	Certificate of Correction to the Certificate of Designation, filed December 16, 2021		Form 8-K/A (Exhibit 3.2)	12/17/21	001-3619
3.6	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Pulmatrix, Inc., dated as of February 5, 2019		Form 8-K (Exhibit 3.1)	02/06/19	001-3619
3.7	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Pulmatrix, Inc., dated as of February 28, 2022		Form 10-K (Exhibit 3.7)	03/29/22	001-3619
3.8	Amendment to the Restated Bylaws of Pulmatrix Inc., dated as of April 28, 2022		Form 8-K (Exhibit 3.1)	04/29/22	001-36199
4.1	Form of Specimen Stock Certificate		Form 8-K (Exhibit 4.1)	06/16/15	001-3619
4.2	Form of Representative's Warrant Agreement		Form S-1/A (Exhibit 4.2)	02/24/14	333-19047
4.3	Warrant Agreement, dated June 16, 2015, by and between Pulmatrix, Inc. and Hercules Technology Growth Capital, Inc.		Form 8-K (Exhibit 10.3)	06/16/15	001-3619
4.4	Form of Warrant issued in Pulmatrix Operating Private Placement, dated June 15, 2015		Form 10-Q (Exhibit 10.8)	08/14/15	001-3619
4.5	Form of Series B Warrant issued in Pulmatrix Public Offering, dated March 28, 2018		Form S-1/A (Exhibit 4.8)	03/28/18	333-22363
4.6	Form of Pre-Funded Warrant issued in Pulmatrix Public Offering, dated March 28, 2018		Form S-1/A (Exhibit 4.7)	03/28/18	333-22363
4.7	Form of Pre-Funded Warrant issued in Pulmatrix Public Offering, dated December 3, 2018		Form 8-K (Exhibit 4.1)	12/03/18	001-3619

4.8	Form of Common Warrant issued in Pulmatrix Public Offering, dated December 3, 2018	Form 8-K (Exhibit 4.2)	12/03/18	001-36199	
4.9	Form of Underwriter Warrant issued in Pulmatrix Public Offering, dated January 31, 2019	Form 8-K (Exhibit 4.1)	1/30/19	001-36199	
4.10	Form of Underwriter Warrant issued in Pulmatrix Public Offering, dated February 4, 2019	Form 8-K (Exhibit 4.1)	02/01/19	001-36199	
4.11	Form of Common Warrant issued in Pulmatrix Direct Registered Offering, dated February 12, 2019	Form 8-K (Exhibit 4.1)	02/11/19	001-36199	
4.12	Form of Placement Agent Warrant issued in Pulmatrix Registered Direct Offering, dated February 12, 2019	Form 8-K (Exhibit 4.2)	02/11/19	001-36199	
4.13	Form of Common Stock Warrant issued in Pulmatrix Public Offering, dated April 1, 2019	Form S-1/A (Exhibit 4.13)	04/01/19	333-230395	
4.14	Form of Pre-Funded Warrant issued in Pulmatrix Public Offering, dated April 1, 2019	Form S-1/A (Exhibit 4.11)	04/01/19	333-230395	
4.15	Form of Underwriter Warrant issued in Pulmatrix Public Offering, dated April 1, 2019	Form S-1/A (Exhibit 4.12)	04/01/19	333-230395	
4,16	Form of Common Warrant issued in Pulmatrix Public Offering, dated April 16, 2020	Form 8-K (Exhibit 4.1)	04/16/20	001-36199	
4.17	Form of Placement Agent Warrant issued in Pulmatrix Public Offering dated April 16, 2020	Form 8-K (Exhibit 4.1)	04/20/20	001-36199	
4.18	Form of Warrant Dated July 9, 2020	Form 8-K (Exhibit 4.1)	07/09/20	001-36199	
4.19	Form of Common Stock Purchase Warrant, dated December 17, 2021	Form 8-K (Exhibit 4.1)	12/15/21	001-36199	
4.20	Form of Placement Agent Warrant dated December 17, 2021	Form 8-K (Exhibit 4.2)	12/15/21	001-36199	
4.21	Description of Securities	Form 10-K (Exhibit 4.21)	03/29/22	001-36199	
4.22	Form of Placement Agent Warrant dated February 16, 2021	Form 8-K (Exhibit 4.1)	02/16/21	001-36199	
10.1*	Pulmatrix, Inc. Amended and Restated 2013 Employee, Director and Consultant Equity Incentive Plan	Form 8-K (Exhibit 10.6)	06/16/15	001-36199	
10.2*	Pulmatrix, Inc. 2013 Employee, Director and Consultant Equity Incentive Plan	Form S-8 (Exhibit 99.2)	07/20/15	333-205752	
10.3*	Pulmatrix Inc. 2003 Employee, Director and Consultant Stock Plan	Form S-8 (Exhibit 99.3)	07/20/15	333-205752	
10.4	License, Development and Commercialization Agreement, dated June 9, 2017, by and between Pulmatrix, Inc. and Respivert Ltd.	Form 10-Q (Exhibit 10.1)	08/04/17	001-36199	
10.5	First Amendment to the Pulmatrix, Inc. Amended and Restated 2013 Employee, Director and Consultant Equity Incentive Plan, dated as of June 5, 2018	Form 8-K (Exhibit 10.1)	06/07/18	001-36199	
10.6*	Amended and Restated Employment Agreement, dated June 28, 2019, by and between the Company and Teofilo Raad	Form 10-K/A (Exhibit 10.1)	06/28/19	001-36199	
10.7	Development and Commercialization Agreement, dated as of April 15, 2019, by and between Cipla Technologies, LLC and Pulmatrix, Inc.	Form 10-Q (Exhibit 10.4)	08/05/19	001-36199	

10.8*	Second Amendment to the Pulmatrix, Inc. Amended and Restated 2013 Employee, Director and Consultant Equity Incentive Plan, dated March 11, 2019		Form S-8 (Exhibit 99.3)	06/04/19	333-23193
10.9*	Third Amendment to the Pulmatrix, Inc. Amended and Restated 2013 Employee, Director and Consultant Equity Incentive Plan, dated as of September 6, 2019		Form 8-K (Exhibit 10.1)	09/09/19	001-3619
10.10**	License, Development and Commercialization Agreement, by and between Pulmatrix, Inc. and Johnson & Johnson Enterprise Innovation, Inc., dated as of December 26, 2019		Form 10-K (Exhibit 10.13)	03/26/20	001-3619
10.11	Securities Purchase Agreement		Form 8-K (Exhibit 10.1)	04/16/20	001-3619
10.12	Form of Letter Agreement		Form 8-K (Exhibit 10.1)	07/09/20	001-3619
10.13	Form of Securities Purchase Agreement dated December 15, 2021, by and between Pulmatrix, Inc. and the purchaser parties thereto		Form 8-K (Exhibit 10.1)	12/15/21	001-3619
10.14**	Second Amendment to Development and Commercialization Agreement, dated as of November 8, 2021, by and between Cipla Technologies, LLC and Pulmatrix, Inc.		Form 8-K (Exhibit 10.1)	11/09/21	001-3619
10.15	Form of Securities Purchase Agreement dated February 11, 2021, by and between Pulmatrix, Inc. and the purchaser parties thereto		Form 8-K (Exhibit 10.1)	02/16/21	001-3619
10.16*	Consulting Agreement, dated November 30, 2021, by and between Pulmatrix, Inc. and Danforth Advisors, LLC		Form 8-K (Exhibit 10.1)	04/14/22	001-36199
10.17***	Third Amendment to the Development and Commercialization Agreement, dated as of January 6, 2024, by and among Pulmatrix, Inc., Pulmatrix Operating Company, Inc., and Cipla Technologies LLC.		Form 8-K (Exhibit 10.1)	01/08/24	001-3619
10.18*	Letter Agreement, dated January 6, 2024, by and between Teofilo Raad and the Company		Form 8-K (Exhibit 10.2)	01/08/24	001-3619
21.1	List of Subsidiaries		Form 10-K (Exhibit 21.1)	03/13/18	001-3619
23.1	Consent of Marcum LLP, independent registered public accounting firm, to the Form 10-K	X			
31.1	Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	X			
31.2	Certification of Principal Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	X			
32.1	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	X (furnished herewith)			
32.2	Certification of Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	X (furnished herewith)			
97.01	Compensation Recovery Policy	X			
101. INS	Inline XBRL Instance Document	X			
101.SCH	Inline XBRL Taxonomy Extension Schema Document	X			
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document	X			
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document	X			
101.LAB	Inline XBRL Taxonomy Extension Labels Linkbase Document	X			
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document	X			
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101)				

* These exhibits are management contracts or compensatory plans or arrangements.

** Portions of this exhibit have been omitted pursuant to Item 601(b)(10)(iv) of Regulation S-K under the Securities Act of 1933, as amended, because they are both (i) not material and (ii) th type that the registrant treats as private or confidential. A copy of the omitted portions will be furnished to the SEC upon its request.

*** Certain of the schedules (and similar attachments) to this exhibit have been omitted in accordance with Item 601(a)(5) of Regulation S-K under the Securities Act because they do not conta information material to an investment or voting decision and that information is not otherwise disclosed in the exhibit or the disclosure document. The registrant hereby agrees to furnish copy of all omitted schedules (or similar attachments) to the Securities and Exchange Commission upon its request.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereun duly authorized.

PULMATRIX, INC.

Date: March 30, 2023 March 28, 2024

By: */s/ Teofilo Raad*
Teofilo Raad
Chief Executive Officer and President

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 indicat below and on the dates indicated.

Signature	Title	Date
/s/ Teofilo Raad Teofilo Raad	Chief Executive Officer, President and Director (Principal Executive Officer)	March 30, 2023 28, 2024
/s/ Peter Ludlum Peter Ludlum	Interim Chief Financial Officer (Principal Financial and Accounting Officer)	March 30, 2023 28, 2024
/s/ Michael J. Higgins Michael J. Higgins	Chairman of the Board of Directors	March 30, 2023 28, 2024
/s/ Richard Batycky, Ph.D. Richard Batycky, Ph.D.	Director	March 30, 2023 28, 2024
/s/ Todd Bazemore Todd Bazemore	Director	March 30, 2023 28, 2024
/s/ Christopher Cabell, M.D. Christopher Cabell, M.D.	Director	March 30, 2023 28, 2024
/s/ Anand Varadan Anand Varadan	Director	March 30, 2023 28, 2024

PULMATRIX, INC.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders Stockholders and Board of Directors of
Pulmatrix, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Pulmatrix, Inc. (the "Company") as of December 31, 2022 December 31, 2023 and 2021, 2022, the related consolidated statements operations, stockholders' equity and cash flows for each of the two years in the period ended December 31, 2022, December 31, 2023 and the related notes (collectively referred to as the "financ statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2022 December 31, 2023 and 2021, 2022 and t results of its operations and its cash flows for each of the two years in the period ended December 31, 2022, December 31, 2023 in conformity with accounting principles generally accepted in t United States of America.

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 pub 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 t 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 audits to obtain reasonable assurance about whether the financ 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 financ 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 t 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 risl 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 a 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 matter communicated below is a matter arising from the current period audit of the financial statements that were communicated or required to be communicated to the au 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 communicati of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing separ opinions on the critical audit matter or on the accounts or disclosures to which it relates.

Revenue Recognition – Estimated Total Contract Costs

Description of the Matter

As described in Note 2 and Note 6 to the financial statements the Company recognizes revenue from non-refundable, upfront fees allocated to a license, when such license is transferred to the custom through collaboration arrangements and the customer is able to use and benefit from the license. For licenses that are combined with other promises, the Company utilizes judgment to assess the natu of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuri progress for purposes of recognizing revenue. The Company uses the input method, with estimated costs to satisfy the performance obligation being the input, as the best measure of the transfer control of the performance obligation.

Management uses significant assumptions and estimates when determining the total estimated costs expected upon satisfying the performance obligation, which in turn led to significant audit judgment, subjectivity and effort in performing procedures to evaluate the total estimate of the costs expected upon satisfying the performance obligation.

How We Addressed the Matter in Our Audit

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the financial statements. These procedures included, amo others, (i) obtaining an understanding of management's process in developing the cost estimates (ii) discussion with the Company's clinical and manufacturing personnel to understand the estimat used in developing the cost estimates (iii) evaluating the appropriateness of management's estimates of total costs to satisfy the performance obligation; (iv) evaluating whether the cost estimates us by management were reasonable considering consistency with company-specific data; and (v) determining the reasonableness of the assumptions used in management's estimation process.

/s/ Marcum LLP

Marcum LLP

We have served as the Company's auditor since 2015.

New York, NY
March 30, 2023 28, 2024

PULMATRIX, INC.
Consolidated Balance Sheets
(in thousands, except share and per share data)

	2022	2021		
	December 31, 2022	December 31, 2021	December 31, 2023	December 31, 2022
Assets				
Current assets:				
Cash and cash equivalents	$ 35,628	$ 53,840	$ 19,173	$ 35,62
Restricted cash	153	-	-	15
Accounts receivable	1,298	67	928	1,29
Prepaid expenses and other current assets	1,068	871	742	1,06
Total current assets	38,147	54,778	20,843	38,14
Property and equipment, net	235	321	1,158	23
Operating lease right-of-use asset	710	2,093	10,309	71
Long-term restricted cash	1,472	1,625	1,472	1,47
Other long-term assets	389	-	176	38
Total assets	$ 40,953	$ 58,817	$ 33,958	$ 40,95
Liabilities and stockholders' equity				
Current liabilities:				
Accounts payable	$ 1,188	$ 839	$ 1,915	$ 1,18
Accrued expenses and other current liabilities	1,638	1,233	947	1,63
Operating lease liability	857	1,431	429	85
Deferred revenue	1,339	939	618	1,33
Total current liabilities	5,022	4,442	3,909	5,02
Deferred revenue, net of current portion	4,822	6,069	3,727	4,82
Operating lease liability, net of current portion	-	857	8,327	
Total liabilities	9,844	11,368	15,963	9,84
Commitments and contingencies (Note 11)				
Commitments and contingencies (Note 10)				
Stockholders' equity:				
Preferred Stock, $0.0001 par value — 500,000 shares authorized; 6,746 shares designated Series A convertible preferred stock; no and 1,830 shares issued and outstanding at December 31, 2022 and 2021, respectively	-	1,081		
Common stock, $0.0001 par value — 200,000,000 shares authorized; 3,639,185 and 3,222,037 shares issued and outstanding at December 31, 2022 and 2021, respectively	-	-		
Preferred stock, $0.0001 par value — 500,000 shares authorized; 6,746 shares designated Series A convertible preferred stock; no shares issued and outstanding at December 31, 2023 and 2022			-	
Common stock, $0.0001 par value — 200,000,000 shares authorized; 3,652,285 and 3,639,185 shares issued and outstanding at December 31, 2023 and 2022, respectively			-	
Additional paid-in capital	304,585	301,008	305,592	304,58
Accumulated deficit	(273,476)	(254,640)	(287,597)	(273,47
Total stockholders' equity	31,109	47,449	17,995	31,10
Total liabilities and stockholders' equity	$ 40,953	$ 58,817	$ 33,958	$ 40,95

See The accompanying notes to footnotes are an integral part of these consolidated financial statements.

PULMATRIX, INC.
Consolidated Statements of Operations
(in thousands, except share and per share data)

	2022	2021	2023	2022
	Year ended December 31,		Year Ended December 31,	
	2022	2021	2023	2022
Revenues	$ 6,071	$ 5,169	$ 7,298	$ 6,07
Operating expenses:				
Operating expenses				
Research and development	18,240	15,382	15,518	18,24
General and administrative	6,778	6,377	6,520	6,77
Impairment of goodwill	-	3,577		
Total operating expenses	25,018	25,336	22,038	25,01
Loss from operations	(18,947)	(20,167)	(14,740)	(18,94
Other income/(expense):				
Other income (expense)				
Interest income	309	7	867	30
Other expense, net	(198)	(11)	(248)	(19
Total other income/(expense), net	111	(4)		
Total other income, net			619	11
Net loss	(18,836)	(20,171)	$ (14,121)	$ (18,83
Less: Deemed dividend - beneficial conversion feature of preferred stock	-	(3,197)		
Net loss attributable to common stockholders	$ (18,836)	$ (23,368)		
Net loss per share attributable to common stockholders - basic and diluted	$ (5.46)	$ (8.63)		
Weighted average common shares outstanding - basic and diluted	3,447,701	2,708,558		
Net loss per share attributable to common stockholders – basic and diluted			$ (3.87)	$ (5.4
Weighted average common shares outstanding – basic and diluted			3,651,911	3,447,70

See The accompanying notes to footnotes are an integral part of these consolidated financial statements.

PULMATRIX, INC.
Consolidated Statements of Stockholders' Equity
(in thousands, except share data)

	Preferred Stock		Common Stock		Additional Paid-in	Accumulated	Total Stockholders'
	Shares	Amount	Shares	Amount	Capital	Deficit	Equity
Balance — January 1, 2021	-	$ -	1,805,250	$ -	$ 257,608	$ (234,469)	$ 23,139
Issuance of preferred stock and common stock warrants, net of issuance costs	6,745	3,984	-	-	2,056	-	6,040
Beneficial conversion feature of preferred stock	-	(3,197)	-	-	3,197	-	-
Deemed dividend related to beneficial conversion feature of preferred stock	-	3,197	-	-	(3,197)	-	-
Conversion of preferred stock to common stock	(4,915)	(2,903)	409,585	-	2,903	-	-
Issuance of common stock, net of issuance costs	-	-	1,000,000	-	37,079	-	37,079
Exercise of warrants	-	-	7,202	-	204	-	204
Stock-based compensation	-	-	-	-	1,158	-	1,158
Net loss	-	-	-	-	-	(20,171)	(20,171)
Balance — December 31, 2021	1,830	$ 1,081	3,222,037	$ -	$ 301,008	$ (254,640)	$ 47,449
Conversion of preferred stock to common stock	(1,830)	(1,081)	152,500	-	1,081	-	-
Issuance of common stock, net of issuance costs	-	-	252,013	-	1,382	-	1,382
Adjustment due to reverse stock split	-	-	12,635	-	-	-	-
Stock-based compensation	-	-	-	-	1,114	-	1,114
Net loss	-	-	-	-	-	(18,836)	(18,836)
Balance — December 31, 2022	-	$ -	3,639,185	$ -	$ 304,585	$ (273,476)	$ 31,109

	Preferred Stock		Common Stock		Additional Paid-in	Accumulated	Total Stockholders'
	Shares	Amount	Shares	Amount	Capital	Deficit	Equity
Balance — January 1, 2022	1,830	$ 1,081	3,222,037	$ -	$ 301,008	$ (254,640)	$ 47,449
Conversion of preferred stock to common stock	(1,830)	(1,081)	152,500	-	1,081	-	-
Issuance of common stock, net of issuance costs	-	-	252,013	-	1,382	-	1,382
Adjustment due to reverse stock split	-	-	12,635	-	-	-	-
Stock-based compensation	-	-	-	-	1,114	-	1,114
Net loss	-	-	-	-	-	(18,836)	(18,836)
Balance — December 31, 2022	-	$ -	3,639,185	$ -	$ 304,585	$ (273,476)	$ 31,109
Issuance of common stock, net of issuance costs	-	-	13,100	-	53	-	53
Stock-based compensation	-	-	-	-	954	-	954
Net loss	-	-	-	-	-	(14,121)	(14,121)
Balance — December 31, 2023	-	$ -	3,652,285	$ -	$ 305,592	$ (287,597)	$ 17,995

See The accompanying notes to footnotes are an integral part of these consolidated financial statements.

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

	2022	2021	2023	2022
	Year ended December 31,		Year Ended December 31,	
	2022	2021	2023	2022
Cash flows from operating activities:				
Net loss	$ (18,836)	$ (20,171)	$ (14,121)	$ (18,83
Adjustments to reconcile net loss to net cash used in operating activities:				
Depreciation and amortization	162	169	134	16
Amortization of operating lease right-of-use asset	1,383	1,067	1,341	1,38
Stock-based compensation	1,114	1,158	954	1,11
Impairment of goodwill	-	3,577		
Loss on disposal of property and equipment			8	
Changes in operating assets and liabilities:				
Accounts receivable	(1,231)	17	370	(1,23
Prepaid expenses and other current assets	(197)	(148)	326	(19
Other long-term assets	(389)	-	213	(38
Accounts payable	511	(149)	727	51
Accrued expenses and other current liabilities	405	(795)	(1,080)	40
Operating lease liability	(1,431)	(1,126)	(3,041)	(1,43
Deferred revenue	(847)	(3,326)	(1,816)	(84
Net cash used in operating activities	(19,356)	(19,727)	(15,985)	(19,35
Cash flows from investing activities:				
Purchases of property and equipment	(86)	(144)	(676)	(8
Net cash used in investing activities	(86)	(144)	(676)	(8
Cash flows from financing activities:				
Proceeds from the issuance of preferred stock and common stock warrants, net of issuance costs	(152)	6,192		
Proceeds from issuance of common stock, net of issuance costs	1,382	37,079	53	1,38
Proceeds from exercise of common stock warrants	-	204		
Preferred stock issuance costs			-	(15
Net cash provided by financing activities	1,230	43,475	53	1,23
Net (decrease) increase in cash, cash equivalents and restricted cash	(18,212)	23,604		
Cash, cash equivalents and restricted cash — beginning of year	55,465	31,861		
Cash, cash equivalents and restricted cash — end of year	$ 37,253	$ 55,465		
Net decrease in cash, cash equivalents and restricted cash			(16,608)	(18,21
Cash, cash equivalents and restricted cash — beginning of period			37,253	55,46
Cash, cash equivalents and restricted cash — end of period			$ 20,645	$ 37,25
Reconciliation of cash, cash equivalents and restricted cash to the consolidated balance sheets:				
Cash and cash equivalents	$ 35,628	$ 53,840	$ 19,173	$ 35,62
Restricted cash	153	-	-	15
Long-term restricted cash	1,472	1,625	1,472	1,47
Total cash, cash equivalents and restricted cash	$ 37,253	$ 55,465	$ 20,645	$ 37,25
Supplemental disclosures of non-cash investing and financing information:				
Operating lease right-of-use asset obtained in exchange for operating lease liability			$ 9,116	$
Purchases of property and equipment not yet paid			$ 389	$
Conversion of preferred stock to common stock	$ 1,081	$ 2,903	$ -	$ 1,08
Fixed asset purchases in accounts payable	$ -	$ 10		
Issuance costs in accounts payable	$ -	$ 152		
Operating lease right-of-use asset obtained in exchange for operating lease obligation	$ -	$ 1,671		
Preferred stock issuance costs associated with placement agent warrants	$ -	$ 300		
Beneficial conversion feature of preferred stock	$ -	$ 3,197		
Deemed dividend related to beneficial conversion feature of preferred stock	$ -	$ 3,197		

See The accompanying notes to footnotes are an integral part of these consolidated financial statements statements.

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

1. Nature of the Business and Basis of Presentation
Organization

Pulmatrix, Inc. (the "Company") was incorporated in 2013 as a Delaware corporation. The Company is a clinical-stage biotechnology biopharmaceutical company focused on the discovery a development of a novel class of inhaled therapeutic products. The Company's proprietary dry powder delivery platform, iSPERSE™ (inhaled Small Particles Easily Respirable and Emitted), engineered to deliver small, dense particles with highly efficient dispersibility and delivery to the airways, which can be used with an array of dry powder inhaler technologies and can be formulat with a variety of drug substances. The Company is developing a pipeline of iSPERSE™-based therapeutic candidates targeted at prevention and treatment of a range of respiratory and other diseas with significant important unmet medical needs.

Reverse Stock Split

On February 28, 2022, the Company effectuated a 1-for-20 reverse stock split of its issued and outstanding shares of common stock (the "Reverse Stock Split") pursuant to which every 20 shares of t Company's issued and outstanding common stock were automatically converted into 1 share of common stock, without any change in the par value per share. Any fraction of a share of common sto that resulted from the Reverse Stock Split was rounded up to the nearest whole share. Accordingly, as required in accordance with U.S. GAAP (as defined below), all common share and per share da are retrospectively restated to give effect of the Reverse Stock Split for all periods presented herein.

2. Summary of Significant Accounting Policies and Recent Accounting Standards
Basis of Presentation

Principles of Consolidation

The consolidated financial statements represent the consolidation of the accounts of the Company and its subsidiary in conformity with generally accepted accounting principles in the United States America ("U.S. GAAP"). All intercompany accounts and transactions have been eliminated in consolidation. Any reference in these notes to applicable guidance is meant to refer to the U.S. GAAP found in the Accounting Standards Codification ("ASC") and Accounting Standards Update ("ASU") of the Financial Accounting Standards Board ("FASB").

Risks, Uncertainties and Liquidity

The ongoing research and development activities will be subject to extensive regulation by numerous governmental authorities in the United States. Prior to marketing in the United States, any dr developed by the Company must undergo rigorous preclinical and clinical testing and an extensive regulatory approval process implemented by the United States Food and Drug Administrati ("FDA") under the Food, Drug and Cosmetic Act. The Company has limited experience in conducting and managing the preclinical and clinical testing necessary to obtain regulatory approval. The can be no assurance that the Company will not encounter problems in the clinical trials that will cause the Company or the FDA to delay or suspend clinical trials.

The Company's success will depend in part on its ability to obtain patents and product license rights, maintain trade secrets, and operate without infringing on the property rights of others, both in t United States and other countries. There can be no assurance that patents issued to or licensed by the Company will not be challenged, invalidated, circumvented, or that the rights granted thereund will provide proprietary protection or competitive advantages to the Company.

Based on its current operating plan, the Company believes that its cash and cash equivalents as of December 31, 2022 December 31, 2023, will be adequate to fund its currently anticipated operati expenses for at least twelve months from the date of these financial statements. statements are issued. The Company will need to secure additional funding in the future, from one or more equity or de financings, collaborations, or other sources, in order to carry out all of the Company's planned research and development activities and regulatory activities; commercialize product candidates; conduct any substantial, additional development requirements requested by the FDA. Additional funding may not be available to the Company on acceptable terms, or at all. If the Company is unable secure additional capital, it will be required to significantly decrease the amount of planned expenditures and may be required to cease operations. In addition, any disruption in the capital marke caused by the novel coronavirus ("COVID-19") pandemic and its ongoing effects could make any financing more challenging, and there can be no assurance that Pulmatrix will be able to obtain su financing on commercially reasonable terms or at all. Curtailment of operations would cause significant delays in the Company's efforts to develop and introduce its products to market, which is critic to the realization of its business plan and the future operations of the Company.

Use of Estimates

In preparing the consolidated financial statements in conformity with U.S. GAAP, management is required to make estimates and assumptions that affect the reported amounts of assets and liabiliti and disclosure of contingent assets and liabilities at the date of the consolidated financial statements, as well as the reported amounts of expenses during the reporting period. Due to inherent uncertain involved in making estimates, actual results may differ from these estimates. On an ongoing basis, the Company evaluates its estimates and assumptio in the Company's consolidated financial statements include, but are not limited to, estimates of future expected costs in order to derive and recognize revenue and estimates related to clinical tr accruals and upfront deposits, fair value used to record preferred stock and warrants transactions, incremental borrowing rate, and accounting for income taxes and the related valuati allowance. deposits.

Concentrations of Credit Risk

Cash is a financial instrument that potentially subjects the Company to concentrations of credit risk. For all periods presented, substantially all of the Company's cash was deposited in accounts at single financial institution that management believes is creditworthy. creditworthy, and the Company has not incurred any losses to date. The Company is exposed to credit risk in the event of default these this financial institutions institution for amounts in excess of the Federal Deposit Insurance Corporation insured limits. The Company maintains its cash at a high-quality financial institution a has not incurred any losses to date.

For the year ended December 31, 2023, revenue from one customer accounted for 100% of revenue recognized in the accompanying consolidated financial statements. For the year ended December 3 2022, revenue from one customer accounted for approximately 99% 99% of revenue recognized in the accompanying consolidated statements of operations. For the year ended December 31, 202 revenue from two customers accounted for approximately 99% of revenue recognized in the consolidated statements of operations. financial statements. As of December 31, 2022 both December 3 2023 and 2021, 2022, one customer accounted for 100%100 and 96%% of accounts receivable, respectively. receivable.

Accounts Receivable and Allowances for Doubtful Accounts

The Company's accounts receivable generally relate to amounts reimbursable under its collaboration agreements with partners. The contractual life of the Company's receivables is generally short ter The Company makes judgments as to its ability to collect outstanding receivables and provides an allowance reserves against receivables for receivables when collection becomes doubtf Provisions estimated losses that may result from a customer's inability to pay. Specific amounts determined to be uncollectable are made based upon a specific review of all significant outstandi invoices and charged against the overall quality and age of those invoices not specifically reviewed. The Company's receivables relate to amounts reimbursed under its collaboration agreements wi partners. reserve. The Company believes that credit risks associated with these its partners are not significant. To date, For the Company has not had any significant write-offs of bad debt, years end December 31, 2023 and 2022, the Company did not have an allowance for doubtful record any expected credit losses related to accounts as of December 31, 2022. receivable.

Cash, Cash Equivalents and Restricted Cash

Cash and cash equivalents are held in US banks and consist of cash deposited in operating and money market accounts.

Restricted cash represents cash held in a depository account at a financial institution to collateralize conditional stand-by letters of credit related to the Company's future and current office a laboratory facility lease agreements agreement in the amounts of $1,421 and $153, respectively, as well as $51 deposited in a money market account as security for a credit card as of December 3 2022 and 2021. December 31, 2023.

During the year ended December 31, 2023, $153 of restricted cash collateralizing a letter of credit related to the Company's former headquarters lease became unrestricted, providing additional ca available for operations.

Property and Equipment, net

Property and equipment are recorded at cost less accumulated depreciation and amortization. Property and equipment are depreciated over their estimated useful lives using the straight-line metho Leasehold improvements are amortized over the shorter of the estimated remaining lease term or the useful lives of the related assets. Repairs and maintenance costs are expensed as incurred, where major improvements are capitalized as additions to property and equipment.

Depreciation and amortization is provided over the following estimated useful lives:

Asset Description	Estimated Useful Lives
Laboratory equipment	5 years
Computer equipment	3 years
Office furniture and equipment	5 years
Leasehold improvements	Shorter of estimated useful life or remaining lease term

Upon retirement or sale, the cost and related accumulated depreciation are removed from the balance sheet and the resulting gain or loss is reflected in operations.

Impairment of Long-Lived Assets

The Company accounts for long-lived assets in accordance with FASB ASC Topic 360, *Property, Plant, and Equipment*. Long-lived assets, other than goodwill, are reviewed for impairment whenev events or changes in circumstances indicate that the carrying amount of the assets might not be recoverable. Conditions that would necessitate an impairment assessment include a significant decline the observable market value of an asset, a significant change in the extent or manner in which an asset is used, or any other significant adverse change that would indicate that the carrying amount of asset or group of assets may not be recoverable. Application of alternative assumptions, such as changes in estimate of future cash flows, could produce significantly different results.

For long-lived assets used in operations, impairment losses are only recorded if the asset's carrying amount is not recoverable through its undiscounted, probability-weighted future cash flows. T Company measures the impairment loss based on the difference between the carrying amount and estimated fair value.

Fair Value of Financial Instruments

The Company is required to disclose information on all assets and liabilities reported at fair value that enables an assessment of the inputs used in determining the reported fair values. FASB ASC Top 820, *Fair Value Measurement*, establishes a hierarchy of inputs used in measuring fair value that maximizes the use of observable inputs and minimizes the use of unobservable inputs by requiring th the observable inputs be used when available. Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from sources independent the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the asset or liability and are developed based on t best information available in the circumstances. The fair value hierarchy applies only to the valuation inputs used in determining the reported fair value of the investments and is not a measure of t investment credit quality. The three levels of the fair value hierarchy are described below:

Level 1 — Valuations based on unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access at the measurement date.

Level 2 — Valuations based on quoted prices for similar assets or liabilities in markets that are not active, or for which all significant inputs are observable, either directly or indirectly.

Level 3 — Valuations that require inputs that reflect the Company's own assumptions that are both significant to the fair value measurement and unobservable.

To the extent that valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. Accordingly, the degree judgment exercised by the Company in determining fair value is greatest for instruments categorized in Level 3. A financial instrument's level within the fair value hierarchy is based on the lowest lev of any input that is significant to the fair value measurement.

As of December 31, 2022 December 31, 2023 and 2021, 2022, the Company did not hold any financial assets or liabilities that were measured at fair value on a recurring or nonrecurring basis. Duri the years ended December 31, 2022 December 31, 2023 and 2021, 2022, there were no transfers between Level 1, Level 2 and Level 3.

Leases

The Company accounts for leases in accordance with FASB ASC Topic 842, *Leases*. At the inception of an arrangement, the Company determines whether the arrangement is or contains a lease bas on the unique facts and circumstances present. The Company has elected not to recognize on the balance sheet leases with terms of one year or less. Options to renew a lease are not included in t Company's initial lease term assessment unless there is reasonable certainty that the Company will renew. The Company monitors its plans to renew its material leases on a quarterly basis.

Operating lease liabilities and their corresponding right-of-use assets are recorded based on the present value of lease payments over the expected remaining lease term. However, certain adjustments the right-of-use asset may be required for items, such as incentives received. The interest rate implicit in lease contracts is typically not readily determinable. As a result, the Company utilizes incremental borrowing rates, which are the rates incurred to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment. T Company has elected to account for the lease and non-lease components as a combined lease component. Lease expense for operating lease payments is recognized on a straight-line basis over the lea term.

Revenue Recognition

The Company's principal sources source of revenue during the years ended December 31, 2022 December 31, 2023 and 2021 were 2022 was derived from a collaboration arrangement and licen agreements agreement that relate to the development and commercialization of PUR1900 under the Cipla Agreement (as defined below) and the license, development and commercializati arrangement under the JJEI Agreement (as defined below).

At inception, management determines whether contracts are within the scope of FASB ASC Topic 606, *Revenue from Contracts with Customers* ("ASC 606") or other topics, including FASB AS Topic 808, *Collaborative Arrangements* ("ASC 808"). For contracts that are within the scope of ASC 808, the Company evaluates whether the counterparty is a customer for any of the units of accou (i.e., distinct goods and services) in the contract. For units of account where the counterparty is considered a customer, the Company applies ASC 606 to those unit(s) of account, including recognitic measurement, presentation, and disclosure guidance. To date, the Company has determined it is appropriate to apply ASC 606 to all contracts and units of account for contracts within the scope of AS 808.

For contracts and units of account that are determined to be within the scope of ASC 606, revenue is recognized when a customer obtains control of promised goods or services. The amount of reven recognized reflects the consideration to which management expects to be entitled to receive in exchange for these goods and services. To achieve this core principle, management applies the followi five steps (i) identify the contract with the customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performan obligations in the contract; and (v) recognize revenue when or as the Company satisfies a performance obligation. The Company only applies the five-step model to contracts when it is probable th the Company will collect the consideration it is entitled to in exchange for the goods or services it transfers to the customer.

Identification of Performance Obligations. Performance obligations promised in a contract are identified at contract inception based on the goods and services that are both capable of being distinct a are distinct in the context of the contract. To the extent a contract includes multiple promised goods and services, management applies judgment to determine whether promised goods and services a both capable of being distinct and distinct in the context of the contract. If these criteria are not met, the promised goods and services are accounted for as a combined performance obligation.

Transaction Price and Milestone Payments. The transaction price is determined based on the consideration to which the Company will be entitled in exchange for transferring goods and services to t customer. At the inception of each contract that includes research or development milestone payments, the Company evaluates whether the milestones are considered probable of being achieved a estimates the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value included in the transaction price. Milestone payments that are not within the Company's control or the licensee, such as regulatory approvals, are not considered probable of being achieved until tho approvals are received. Management evaluates factors such as the scientific, clinical, regulatory, commercial, and other risks that must be overcome to achieve the particular milestone in making th assessment. There is considerable judgment involved in determining whether it is probable that a significant revenue reversal would not occur. At the end of each reporting period, manageme reevaluates the probability of achievement of all milestones subject to constraint and, if necessary, adjust the estimate of the overall transaction price. Any such adjustments are recorded on cumulative catch-up basis, which would affect revenues and earnings in the period of adjustment.

Exclusive Licenses. If the license to the Company's intellectual property is determined to be distinct from the other promises or performance obligations identified in the arrangement, the Compa recognizes revenue from non-refundable, upfront fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. In assessi whether a promise or performance obligation is distinct from the other promises, the Company considers factors such as the research, development, manufacturing and commercialization capabilities the collaboration partner and the availability of the associated expertise in the general marketplace. In addition, the Company considers whether the counterparty can benefit from a promise for intended purpose without the receipt of the remaining promise, whether the value of the promise is dependent on the unsatisfied promise, whether there are other vendors that could provide t remaining promise, and whether it is separately identifiable from the remaining promise. For licenses that are combined with other promises, the Company utilizes judgment to assess the nature of t combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progre for purposes of recognizing revenue. The Company evaluates the measure of progress each reporting period and, if necessary, adjusts the measure of performance and related revenue recognition. T measure of progress, and thereby periods over which revenue should be recognized, are subject to estimates by management and may change over the course of the research and development a licensing agreement. Such a change could have a material impact on the amount of revenue the Company records in future periods.

Research and Development Services. The promises under the Company's arrangements may include research and development services to be performed by the Company on behalf of the counterpar Payments or reimbursements from customers resulting from the Company's research and development efforts are recognized as the services are performed and presented on a gross basis because t Company is the principal for such efforts. The Company uses an input method, according to the ratio of costs incurred to the total costs expected to be incurred in the future to satisfy the performan obligation. In management's judgment, this input method is the best measure of the transfer of control of the performance obligation. Amounts received prior to revenue recognition are recorded deferred revenue. Amounts expected to be recognized as revenue within the 12 months following the balance sheet date are classified as current portion of deferred revenue in the accompanyi consolidated balance sheets. Amounts not expected to be recognized as revenue within the 12 months following the balance sheet date are classified as deferred revenue, net of current portio Reimbursements from and payments to the counterparty that are the result of a collaborative relationship, instead of a customer relationship, such as co-development activities, are recognized as t services are performed and presented as a reduction to research and development expense. To date, the Company has determined that all arrangements which include research and development servic have been transacted with customers and recognized on a gross basis using ASC 606.

Royalties. For contracts that include sales-based royalties, including milestone payments upon first commercial sales and milestone payments based on a level of sales, which are the result of customer-vendor relationship and for which the license is deemed to be the predominant item to which the royalties relate, the Company recognizes revenue at the later of (i) when the related sal occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied or partially satisfied.

Customer Options. If an arrangement is determined to contain customer options that allow the customer to acquire additional goods or services, the goods and services underlying the customer optio that are not determined to be material rights are not considered to be performance obligations at the outset of the arrangement, as they are contingent upon option exercise. The Company evaluates t customer options for material rights, or options to acquire additional goods or services for free or at a discount. If the customer options are determined to represent a material right, the material right recognized as a separate performance obligation at the outset of the arrangement. The Company allocates the transaction price to material rights based on the relative standalone selling price, which determined based on the identified discount and the probability that the customer will exercise the option. Amounts allocated to a material right are not recognized as revenue until, at the earliest, t option is exercised.

For a complete discussion of accounting for the Company's revenue contracts, see Note 6, *Significant Agreements*.

Research and Development Costs

Research and development costs are expensed as incurred and include salaries, benefits, bonus, stock-based compensation, license fees, milestone payments due under license agreements, costs paid third-party contractors to perform research, conduct clinical trials, and develop drug materials and delivery devices; and associated overhead and facilities costs. Clinical trial costs are significant substantial component of research and development expenses and include costs associated with third-party contractors, clinical research organizations ("CROs") and clinical manufacturi organizations ("CMOs"). Invoicing from third-party contractors for services performed can lag several months. The Company accrues the costs of services rendered in connection with third-pa contractor activities based on management's estimate of fees and costs associated with the contract that were rendered during the period and they are expensed as incurred. Research and developme costs that are paid in advance of performance are capitalized as prepaid expenses and amortized over the service period as the services are provided.

Stock-based Compensation

The Company recognizes all employee stock-based compensation as a cost in the consolidated financial statements. Equity-classified awards principally related to stock options, which are measured the grant date fair value of the award. The Company determines grant-date fair value of stock option awards using the Black-Scholes option-pricing model. For service-based vesting grants, expense recognized over the requisite service period based on the number of options or shares expected to ultimately vest. For performance-based vesting grants, expense is recognized over the requisite peri until the performance obligation is met, assuming that it is probable. No expense is recognized for performance-based grants until it is probable the vesting criteria will be satisfied.

Stock-based payments to non-employees are recognized as services are rendered, generally on a straight-line basis. The Company believes that the fair values of these awards are more reliab measurable than the fair values of the services rendered.

Convertible Financial Instruments

The Company bifurcates conversion options from their host instruments and accounts for them as freestanding derivative financial instruments if certain criteria are met. The criteria inclu circumstances in which (a) the economic characteristics and risks of the embedded derivative instrument are not clearly and closely related to the economic characteristics and risks of the host contra (b) the hybrid instrument that embodies both the embedded derivative instrument and the host contract is not re-measured at fair value under otherwise applicable generally accepted accounti principles with changes in fair value reported in earnings as they occur and (c) a separate instrument with the same terms as the embedded derivative instrument would be considered a derivati instrument. An exception to this rule is when the host instrument is deemed to be conventional, as that term is described under applicable U.S. GAAP.

When the Company has determined that the embedded conversion options should not be bifurcated from their host instruments, discounts are recorded for the intrinsic value of any benefici conversion options embedded in the instruments based upon the differences between the fair value of the underlying common stock at the commitment date of the transaction and the effecti conversion price embedded in the instrument. Deemed dividends are also recorded for the intrinsic value of beneficial conversion options embedded in preferred stock based upon the differenc between the fair value of the underlying common stock at the commitment date of the transaction and the effective conversion price embedded in the preferred stock.

Common Stock Warrants

The Company classifies as equity any warrants that (i) require physical settlement or net-share settlement or (ii) provide the Company with a choice of net-cash settlement or settlement in its ov shares (physical settlement or net-share settlement). The Company classifies as assets or liabilities any warrants that (i) require net-cash settlement (including a requirement to net cash settle t contract if an event occurs and if that event is outside the Company's control), (ii) gives the counterparty a choice of net-cash settlement or settlement in shares (physical settlement or net-sha settlement) or (iii) that contain reset provisions that do not qualify for the scope exception. The Company assesses classification of its common stock warrants and other freestanding derivatives at ea reporting date to determine whether a change in classification between assets and liabilities is required. The Company's freestanding derivatives consist of warrants to purchase common stock that we issued in connection with its (i) convertible preferred stock, (ii) private placements, (iii) term loan, (iv) consulting services and (v) underwriting and representative services. The Company evaluat these warrants to assess their proper classification and determined that the common stock warrants meet the criteria for equity classification in the consolidated balance sheets.

Basic and Diluted Net Loss Per Share

Basic and diluted earnings (loss) per share are computed using the two-class method, which is an earnings allocation method that determines earnings (loss) per share for common shares a participating securities. The participating securities consist of the Company's preferred stock. The undistributed earnings are allocated between common shares and participating securities as if earnings had been distributed during the period. In periods of loss, no allocation is made to the preferred shares and diluted net loss per share is the same as basic net loss per share because comm stock equivalents are excluded as their inclusion would be anti-dilutive.

Income Taxes

Income taxes are recorded in accordance with FASB ASC Topic 740, *Income Taxes* ("ASC 740"), which provides for deferred taxes using an asset and liability approach. The Company recogniz deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the consolidated financial statements or tax returns. Deferred tax assets and liabilities a determined based on the difference between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. valuation allowance is provided, if, based upon the weight of available evidence, it is more likely than not that some or all of the net deferred tax assets will not be realized.

The Company accounts for uncertain tax positions in accordance with the provisions of ASC 740. When uncertain tax positions exist, the Company recognizes the tax benefit of tax positions to t extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position, well as consideration of the available facts and circumstances.

Goodwill

Goodwill represents the difference between the consideration transferred and the fair value of the net assets acquired, and liabilities assumed under the acquisition method of accounting for push-dow accounting. Goodwill is not amortized but is evaluated for impairment within the Company's single reporting unit on an annual basis during the fourth quarter, or more frequently if an event occurs circumstances change that would more likely than not reduce the fair value of the Company's reporting unit below its carrying amount. When performing the impairment assessment, the accounti standard for testing goodwill for impairment permits a company to first assess the qualitative factors to determine whether the existence of events and circumstances indicates that it is more likely th not that the goodwill is impaired. If the Company believes, as a result of the qualitative assessment, that it is more likely than not that the fair value of the reporting unit is impaired, the Company th must perform a quantitative analysis to determine if the carrying value of the goodwill exceeds the fair value of the Company. Given the impact of the COVID-19 pandemic and the Company common stock value decline during 2021, the Company determined that goodwill was impaired, and a full impairment charge of $3,577 was recorded during the year ended December 31, 2021.

Recent Accounting Pronouncements

From time to time, new accounting pronouncements are issued by the FASB or other standard setting bodies that are adopted by the Company as of the specified effective date. Except as set for below, the Company did not adopt any new accounting pronouncements during the year ended December 31, 2022 December 31, 2023 that had a material effect on its consolidated financial statement

In August 2020, the FASB issued ASU 2020-06, *"Debt – Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging – Contracts in Entity's Own Equity (Subtopic 815 40)"* ("ASU 2020-06"). ASU 2020-06 simplifies the guidance on accounting for convertible financial instruments by removing the separation models for (1) convertible debt with a cash conversi feature and (2) convertible instruments with a beneficial conversion feature. ASU 2020-06 also requires the application of the if-converted method for calculating diluted earnings per share and sha settlement when an instrument can be settled in cash or shares at the entity's option, unless the instrument is a liability-classified stock-based payment award. The Company elected to early adopt AS 2020-06 as of January 1, 2022, using the modified retrospective method. The adoption of ASU 2020-06 did not have any net impact on the classification or measurement of the Company's convertib financial instruments or contracts in the Company's own equity outstanding as of January 1, 2022, nor the earnings per-share amounts for the year ended December 31, 2022.

In May 2021, the FASB issued ASU 2021-04, *Earnings Per Share (Topic 260), Debt—Modifications and Extinguishments (Subtopic 470-50), Compensation—Stock Compensation (Topic 718), a Derivatives and Hedging—Contracts in Entity's Own Equity (Subtopic 815-40): Issuer's Accounting for Certain Modifications or Exchanges of Freestanding Equity-Classified Written Call Options consensus of the FASB Emerging Issues Task Force)* ("ASU 2021-04"). ASU 2021-04 address how an issuer should account for modifications, or an exchange of freestanding equity-classified writt call options classified as equity that is not within the scope of another topic. The Company elected to early adopt ASU 2021-04 as of January 1, 2022. The adoption of ASU 2021-04 did not have material impact on the Company's consolidated financial statements.

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments—Credit Losses (Topic 326)—Measurement of Credit Losses on Financial Instruments* ("ASU 2016-13"), which has be subsequently amended. The provisions of ASU 2016-13 modify the impairment model for financial instruments to utilize an expected loss methodology in place of the currently used incurred lc methodology and require consideration of a broader range of reasonable and supportable information to inform credit loss estimates. The Company plans to adopt adopted the standard as of January 2023. The adoption of this standard is did not expected to have a material effect on the Company's consolidated financial statements.

As of December 31, 2022 December 31, 2023, there have been are no other new, or existing recently issued, or adopted, accounting pronouncements that are of significance, or potential significanc that impact the Company's consolidated financial statements.

3. Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consisted of the following:

	December 31, 2023	December 31, 2022
Insurance	$ 232	$ 286
Software and hosting costs	108	99
Clinical and consulting	30	517
Other	372	166
Total prepaid expenses and other current assets	$ 742	$ 1,068

	As of December 31,	
	2022	2021
Clinical and consulting	$ 517	$ 230
Insurance	286	325
Software and hosting costs	99	-
Other	166	316
Total prepaid expenses and other current assets	$ 1,068	$ 871

4. Property and Equipment, Net

Property and equipment, net consisted of the following:

	December 31, 2023	December 31, 2022
Laboratory equipment	$ 1,656	$ 1,827
Capital in progress	600	-
Office furniture and equipment	401	217
Computer equipment	237	275
Leasehold improvements	-	664
	2,894	2,983
Less accumulated depreciation and amortization	(1,736)	(2,748)
Property and equipment, net	$ 1,158	$ 235

	As of December 31,	
	2022	2021
Laboratory equipment	$ 1,827	$ 1,838
Leasehold improvements	664	602
Computer equipment	275	304
Office furniture and equipment	217	217
	2,983	2,961
Less accumulated depreciation and amortization	(2,748)	(2,640)
Property and equipment, net	$ 235	$ 321

Depreciation and amortization expense for the years year ended December 31, 2022 December 31, 2023 and 2021 2022 was $162 134 and $169 162, respectively. During the years year ended Decemb 31, 2022 December 31, 2023, the Company disposed of certain property and 2021, equipment primarily in connection with moving to its new office, resulting in a loss on disposal of $8. During the ye ended December 31, 2022, the Company disposed of certain fixed assets with immaterial gross costs and accumulated depreciation.

5. Accrued Expenses and other current liabilities Other Current Liabilities

Accrued expenses and other current liabilities consisted of the following:

	As of December 31,	
	2022	2021
Wages and incentives	$ 1,130	$ 1,051
Clinical and consulting	475	97
Legal and patents	-	58
Other	33	27
Total accrued expenses and other current liabilities	$ 1,638	$ 1,233

	December 31, 2023	December 31, 2022
Accrued purchases of property and equipment	$ 389	$ -
Clinical and consulting	347	475
Wages and incentives	70	1,130
Legal and patents	42	-
Other	99	33
Total accrued expenses and other current liabilities	$ 947	$ 1,638

6. Significant Agreements

Development and Commercialization Agreement with Cipla Technologies LLC ("Cipla")

On April 15, 2019, the Company entered into a Development and Commercialization Agreement (the "Cipla Agreement") with Cipla for the co-development and commercialization, on a worldwi exclusive basis, of PUR1900, the Company's inhaled iSPERSE™ drug delivery system (the "Product") enabled formulation of the antifungal drug itraconazole, which is only available as an oral dru for the treatment of all pulmonary indications, including allergic bronchopulmonary aspergillosis ("ABPA") in patients with asthma. Pulmatrix The Company entered into an amendment to the Cip Agreement on November 8, 2021 (the "Cipla "Second Amendment"), and all a subsequent amendment on January 6, 2024 (the "Third Amendment"). All references to the Cipla Agreement herein ref to the Cipla Agreement, as amended.

The Company received a non-refundable upfront payment of $22.0 million (the "Upfront Payment") under the Cipla Agreement. Upon receipt of the Upfront Payment, the Company irrevocab assigned to Cipla the following assets, solely to the extent that each covers the Product in connection with any treatment, prevention, and/or diagnosis of diseases of the pulmonary system ("Pulmona Indications"): all existing and future technologies, current and future drug master files, dossiers, third-party contracts, regulatory filings, regulatory materials and regulatory approvals, patents, a intellectual property rights, as well as any other associated rights and assets directly related to the Product, specifically in relation to pulmonary indications Pulmonary Indications (collectively, t "Assigned Assets"), excluding most specifically the Company's iSPERSE™ technology. A portion of the Upfront Payment was deposited by the Company into a bank account, along with an equ amount from the Company, and was dedicated to the development of the Product (the "Initial Development Funding"). The Initial Development Funding was depleted during the year ended Decemb 31, 2021, and at which point the Company and Cipla are now each became responsible for a portion of the development costs actually incurred as described below (the "Co-Development Phase").

The Pursuant to the Second Amendment, the Company and Cipla will were each be responsible for 60% and 40%, respectively, of the Company's overhead costs and the time spent by the Company employees and consultants on development of the Product ("Direct Costs"), in addition to which, Cipla will reimburse the Company an amount equal to 10% of aggregate Direct Costs upon t achievement of the development milestones set forth in the table below, potentially bringing the sharing of Direct Costs to a 50/50 basis. . The Company will continue to share all other developme costs with Cipla that are not Direct Costs, such as the cost of clinical research organizations, manufacturing costs and other third-party costs, on a 50/50 basis basis..

Phase 2b Development Plan – Development Milestones

Development Milestone	Milestone Date
25% of patients enrolled in Phase 2b clinical study are dosed	**June 30, 2023**
Company delivers summary of key efficacy and safety data to include FEV_1, IgE, ACQ-6, number of subjects withdrawn, any severe adverse events related to the medication and an overall summary table of adverse events ("Topline Results") to the joint steering committee ("JSC").	**June 30, 2024**

Pursuant to the Third Amendment, the Company and Cipla agreed that, during the period commencing on January 6, 2024 and ending July 30, 2024 (the "Wind Down Period"), the Company w complete all Phase 2b activities, assign or license all patents to Cipla and their registration with the appropriate authorities in regions other than the United States, complete a physical and demonstrat technology transfer and secure all data from the Phase 2b study for inclusion in the safety database. The Company will share costs with Cipla during the Wind Down Period in the same proportions effect with the Second Amendment discussed above, but subject to a maximum reimbursement amount by Cipla as approved by the joint steering committee.

Phase 3 Development Plan – Development Milestones

Development Milestone	Milestone Date
25% of patients enrolled in Phase 3 clinical study dosed	**To be proposed by JSC**
Company delivers Topline Results to the JSC	**To be proposed by JSC**
The Prescription Drug User Fee Act (the "PDUFA")	**To be proposed by JSC**

Accounting Treatment

The Company concluded that because both it and Cipla are active participants in the arrangement and are exposed to the significant risks and rewards of the collaboration, the Company's collaborati with Cipla is within the scope of ASC 808. The Company concluded that Cipla is a customer since they contracted with the Company to obtain research and development services and a license to t Assigned Assets, each of which is an output of the Company's ordinary activities, in exchange for consideration. Therefore, the Company has applied the guidance in ASC 606 to account for t research and development services and a license within the contract. The Company determined that the research and development services and license to the Assigned Assets are considered high interdependent and highly interrelated and therefore are considered a single combined performance obligation because Cipla cannot benefit from the license without the performance by Pulmatrix t Company of the research and development services. Such research and development services are highly specialized and proprietary to Pulmatrix the Company and therefore not available to Cipla fro any other third party.

The Company initially determined the total transaction price to be $22.0 million – comprised of $12.0 million for research and development services for the Product and $10.0 million for t irrevocable license to the Assigned Assets. Any consideration related to the Co-Development Phase was not initially included in the transaction price as such amounts are subject to the variab consideration constraint. Additionally, upon commercialization, Cipla and the Company will share equally, both positive and negative total free cash-flows earned by Cipla in respect of the Produ However, the Company has not included such free cash-flows in the transaction price as these milestones are constrained until after the commercialization of the Product. constrained.

The Company concluded that the Second Amendment represented a contract modification that is treated for accounting purposes as the termination of the Cipla Agreement and a creation of a ne contract (the "Amended Cipla Agreement"). Accordingly, the modification is accounted for on a prospective basis. The total transaction price for the Amended Cipla Agreement includes variab consideration from the Second Amendment as well as $7.4 million deferred under the Cipla Agreement as of the Second Amendment execution date.
The Company concluded that the Third Amendment, executed on January 6, 2024, is a nonrecognized subsequent event for the year ended December 31, 2023. Accordingly, the Company's accounti for the Cipla Agreement as of and during the year ended December 31, 2023 reflects the contract and estimates in effect as of December 31, 2023.

Revenue is recognized for the Amended Cipla Agreement as the research and development services are provided using an input method, according to the ratio of costs incurred to the total cos expected to be incurred in the future to satisfy the Company's obligations. In management's judgment, this input method is the best measure of the transfer of control of the combined performan obligation. The amounts received that have not yet been recognized as revenue are recorded in deferred revenue on the Company's consolidated balance sheets, with amounts expected to be recogniz in the next 12 months recorded as current.

During the years ended December 31, 2022 December 31, 2023 and 2021, 2022, the Company recognized $6.1 7.3 million and $1.4 6.1 million, respectively, in revenue related to the research a development services and irrevocable license to the Assigned Assets in the Company's consolidated statements of operations, respectively. operations. Of the revenue recognized during the year yea ended December 31, 2022, December 31, 2023 and 2022, $1.1 million and $0.8 million, respectively, was included in deferred revenue at the beginning of the period. As of December 3 2022 December 31, 2023, the aggregate transaction price related to the Company's unsatisfied obligations was $6.2 4.3 million and was recorded in deferred revenue, $1.3 0.6 million of which w current.

License, Development and Commercialization Agreement with Johnson & Johnson Enterprise Innovation, Inc. ("JJEI")
All rights to the Company's kinase inhibitor portfolio, including PUR1800 and PUR5700, reverted to the Company upon the termination of the License, Development and Commercializati Agreement (the "JJEI License Agreement"), dated December 26, 2019, with Johnson & Johnson Enterprise Innovation, Inc. ("JJEI"). JJEI notified the Company that they were terminating the JJ License Agreement in April 2021, and the effective date of the termination was July 6, 2021.
Accounting Treatment
Revenue associated with the combined research and development services for the licensed product and the irrevocable license was recognized as revenue as the research and development services a provided using an input method, according to the ratio of costs incurred to the total costs expected to be incurred in the future to satisfy the performance obligation. In management's judgment, th input method was the best measure of the transfer of control of the performance obligation. During the year ended December 31, 2021, the Company recognized $3.7 million in revenue related to t research and development services and license agreement in the Company's consolidated statements of operations. As of December 31, 2021, the Company had no unsatisfied obligations under the JJ License Agreement.
7. Preferred Stock
The Company's Amended and Restated Certificate of Incorporation (the "Articles") provides for a class of authorized stock known as preferred stock, consisting of 500,000 shares, $0.0001 par val per share, issuable from time to time in one or more series. During the year ended December 31, 2021, the Articles were amended to designate and authorize 6,746 shares of Series A Convertib Preferred Stock (the "Series A Preferred Stock").

On December 17, 2021, the Company closed a registered direct offering with certain institutional investors for the issuance and sale of an aggregate of 6,745.008 shares of Series A Preferred Stock a warrants to purchase up to an aggregate of 281,047 shares of common stock, par value $0.0001 per share, for gross proceeds of $6.7 million, or net cash proceeds of $6.0 million after deducting $0 million related to placement agent's fees and other offering expenses. The shares of Series A Preferred Stock have a stated value of $1,000.00 per share and are initially convertible into an aggregate 562,085 shares of common stock at a conversion price of $12.00 per share at any time. The common warrants have an exercise price of $13.99 per share. In addition, the Company issued the placeme agent designees warrants to purchase up to 36,538 shares of common stock at an exercise price of $14.99 per share and their fair value of $0.4 million was recorded as an additional offering cost. Bo the common warrants and the placement warrants are exercisable six months following the date issuance and have a five-year term.

The Series A Preferred Stock does not have any mandatory redemption provisions, contingently redeemable redemption provisions, preferential dividend rights, liquidation preferences, or voting righ apart from mirrored, non-discretionary voting rights with common stock as a single class, equal to 100,000 votes per share of common stock underlying the Series A Preferred Stock on the Rever Stock Split proposal which was approved by the Company's stockholders at a special stockholder meeting on February 10, 2022.

The Company evaluated the classification of the Series A Preferred Stock and determined equity classification was appropriate due to no mandatory or contingently redeemable redemption featur The warrants issued to the investors were considered freestanding equity classified instruments. The Company first allocated gross proceeds from the registered direct offering between the Series Preferred Stock and the warrants issued to investors using a relative fair value approach, resulting in an initial allocation to both instruments of $4.8 million and $2.0 million, respectively. The issuan costs, inclusive of the fair value of warrants issued to placement agent designees, were allocated between the Series A Preferred Stock and the warrants issued to investors in a systematic and ration manner resulting in an allocation to both instruments of $0.8 million and $0.3 million, for an initial net allocation of $4.0 million and $1.6 million, respectively. On the issuance date, the Compa estimated the fair value of the warrants issued to investors and to placement agent designees using a Black-Scholes option pricing model using the following assumptions: (i) contractual term of 5 yea (ii) expected volatility rate of 117.98%, (iii) risk-free interest rate of 1.23%, (iv) expected dividend rate of 0%, and (v) closing price of the Company's common stock of the day immediately precedi the registered direct offering. The fair value of Series A Preferred Stock was estimated based upon equivalent common shares that preferred stock could have been converted into at the closing price the day immediately preceding the purchase date.

The embedded conversion feature was evaluated and bifurcation from the preferred stock equity host was not considered necessary. A beneficial conversion feature was separately recorded as discount to the Series A Preferred Stock resulting in the amount of $3.2 million based on the intrinsic value of the beneficial conversion feature. As the Series A Preferred Stock was immediate convertible into common stock, a deemed dividend related to the discount associated with the beneficial conversion feature was immediately recorded.

As of December 31, 2022, all 6,745.008 shares of Series A Preferred Stock were converted into 562,085 shares of common stock.

8. 7. Common Stock

2022

At-the-Market Offering

In May 2021, the Company entered into an At-The-Market Sales Agreement (the "Sales Agreement") with H.C. Wainwright and Co., LLC ("HCW") to act as the Company's sales agent with respect the issuance and sale of up to $20.0 million of the Company's shares of common stock, from time to time in an at-the-market public offering (the "ATM Offering"). Sales of common stock under t Sales Agreement are made pursuant to an effective shelf registration statement on Form S-3, which was filed with the SEC Securities and Exchange Commission ("SEC") on May 26, 2021, a subsequently declared effective on June 9, 2021 (File No. 333-256502), and a related prospectus. HCW acts as the Company's sales agent on a commercially reasonable efforts basis, consistent with normal trading and sales practices and applicable state and federal laws, rules and regulations and the rules of The NASDAQ Nasdaq Capital Market. Market ("Nasdaq"). If expressly authorized by t Company, HCW may also sell the Company's common stock in privately negotiated transactions. There is no specific date on which the ATM Offering will end, there are no minimum sa requirements and there are no arrangements to place any of the proceeds of the ATM Offering in an escrow, trust or similar account. HCW is entitled to compensation at a fixed commission rate 3.0% of the gross proceeds from the sale of the Company's common stock pursuant to the Sales Agreement.

No During the year ended December 31, 2023, the Company sold 13,100 shares of its common stock were sold under the Sales Agreement during the year ended December 31, 2021. at a weighte average price of approximately $4.25 per share, which resulted in net proceeds of approximately $53 thousand.

During the year ended December 31, 2022, the Company sold 252,013shares of its common stock under the Sales Agreement at a weighted-average price of approximately $5.70per share whi resulted in net proceeds of approximately $1.4million.

2021

Registered Direct Offering

On February 16, 2021, the Company closed on a registered direct offering with certain healthcare-focused institutional investors for the sale of 1,000,000 shares of its common stock for gross procee of $40.0 million, or $37.1 million after deducting placement agent's fees and other offering expenses. In connection with the offering, 65,003 warrants with a five-year expiry were issued to placeme agent designees at an exercise price of $49.99 per share. The fair value of the placement agent warrants was $31.40 per share. The shares of common stock were offered by the Company pursuant to "shelf" registration statement on Form S-3 (File No. 333-230225) previously filed with the SEC on March 12, 2019, and declared effective by the SEC on March 15, 2019.

Exercise of Warrants

During the year ended December 31, 2021, warrants issued in 2019 and 2020 were exercised on a cash basis to purchase 7,202 shares of the Company's common stock for proceeds of $0.2 million.

9. 8. Warrants

The following table summarizes warrant activity for the years year ended December 31, 2022 and 2021: December 31, 2023:

	Number of Common Warrants	Weighted Average Exercise Price	Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding January 1, 2021	1,164,359	$ 68.20	3.30	$ -
Warrants Issued	382,588	20.20		
Warrants Exercised	(7,202)	33.41		
Outstanding December 31, 2021	1,539,745	$ 56.39	2.98	$ -
Warrants Expired	(254,942)	31.65		
Outstanding December 31, 2022	1,284,803	$ 61.30	2.53	$ -

	Number of Common Warrants	Weighted Average Exercise Price	Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding January 1, 2023	1,284,803	$ 61.30		
Warrants Expired	(123,310)	149.99		
Outstanding December 31, 2023	1,161,493	$ 51.89	1.78	$ -

The following represents a summary of the warrants outstanding and exercisable as at December 31, 2023, all of December 31, 2022; which are equity-classified:

Issue Date	Adjusted Exercise Price	Expiration Date	Number of Shares Underlying Warrants Outstanding	Exercisable
December 17, 2021	$ 14.99	December 15, 2026	36,538	36,538
December 17, 2021	$ 13.99	December 17, 2026	281,047	281,047
February 16, 2021	$ 49.99	February 11, 2026	65,003	65,003
August 7, 2020	$ 35.99	July 14, 2025	90,743	90,743
August 7, 2020	$ 44.99	July 14, 2025	10,939	10,939
July 23, 2020	$ 35.99	July 14, 2025	77,502	77,502
July 13, 2020	$ 44.99	July 14, 2025	21,846	21,846
July 13, 2020	$ 35.99	July 14, 2025	334,800	334,800
April 8, 2019	$ 26.99	April 8, 2024	65,907	65,907
April 8, 2019	$ 33.74	April 3, 2024	39,871	39,871
February 12, 2019	$ 36.62	February 7, 2024	5,548	5,548
February 12, 2019	$ 26.79	August 12, 2024	66,675	66,675
February 4, 2019	$ 42.49	January 30, 2024	1,732	1,732
January 31, 2019	$ 42.49	January 26, 2024	511	511
December 3, 2018	$ 77.99	June 3, 2024	46,876	46,876
June 15, 2015	$ 1,509.99	Five years after milestone achievement	15,955	-
Total			1,161,493	1,145,538

Issue Date	Classification	Adjusted Exercise Price	Expiration Date	Number of Shares Underlying Warrants Outstanding	Exercisable
December 17, 2021	Equity	$ 14.99	December 15, 2026	36,538	36,538
December 17, 2021	Equity	$ 13.99	December 17, 2026	281,047	281,047
February 16, 2021	Equity	$ 49.99	February 11, 2026	65,003	65,003
August 7, 2020	Equity	$ 35.99	July 14, 2025	90,743	90,743
August 7, 2020	Equity	$ 44.99	July 14, 2025	10,939	10,939
July 23, 2020	Equity	$ 35.99	July 14, 2025	77,502	77,502
July 13, 2020	Equity	$ 44.99	July 14, 2025	21,846	21,846
July 13, 2020	Equity	$ 35.99	July 14, 2025	334,800	334,800
April 8, 2019	Equity	$ 26.99	April 8, 2024	65,907	65,907
April 8, 2019	Equity	$ 33.74	April 3, 2024	39,871	39,871
February 12, 2019	Equity	$ 36.62	February 7, 2024	5,548	5,548
February 12, 2019	Equity	$ 26.79	August 12, 2024	66,675	66,675
February 4, 2019	Equity	$ 42.49	January 30, 2024	1,732	1,732
January 31, 2019	Equity	$ 42.49	January 26, 2024	511	511
December 3, 2018	Equity	$ 77.99	June 3, 2024	46,876	46,876
April 3, 2018	Equity	$ 149.99	April 3, 2023	117,559	117,559
April 4, 2018	Equity	$ 149.99	April 4, 2023	5,751	5,751
June 15, 2015	Equity	$ 1,509.99	Five years after milestone achievement	15,955	-
				1,284,803	1,268,848

10. 9. Stock-based Compensation

The Company sponsors the Pulmatrix, Inc. Amended and Restated 2013 Employee, Director and Consultant Equity Incentive Plan (the "Incentive Plan"). As of December 31, 2022 December 31, 202 the Incentive Plan provided for the grant of up to 454,363 636,322shares of the Company's common stock, of which 145,735 288,186 shares remained available for future grant.
In addition, the Company sponsors two legacy plans under which no additional awards may be granted. As of December 31, 2022 December 31, 2023, the two legacy plans have a total of 33 8 optio outstanding, all of which are fully vested and for which common stock will be delivered issued upon exercise.

The following table summarizes stock option activity for the years year ended December 31, 2022 and 2021: December 31, 2023:

	Number of Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding — January 1, 2023	304,823	$ 28.66		
Granted	118,472	$ 3.98		
Forfeited or cancelled	(78,965)	$ 25.27		
Expired	(24)	$ 376.25		
Outstanding — December 31, 2023	344,306	$ 20.92	7.54	$ -
Exercisable — December 31, 2023	206,695	$ 29.99	6.88	$ -

	Number of Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding — January 1, 2021	144,962	$ 64.20	8.75	$ 60
Granted	58,039	27.79		
Forfeited or expired	(6,995)	83.78		
Outstanding — December 31, 2021	196,006	$ 52.72	8.12	$ -
Granted	125,487	6.40		
Forfeited or expired	(16,670)	143.95		
Outstanding — December 31, 2022	304,823	28.66	7.98	$ -
Exercisable — December 31, 2022	148,482	$ 44.39	7.23	$ -

The Company records stock-based compensation expense related to stock options based on their grant-date fair value. During the years ended December 31, 2022 December 31, 2023 and 2021, 202 the Company used the Black-Scholes option-pricing model to estimate the fair value of stock option grants and to determine the related compensation expense. The assumptions used in calculating t fair value of stock-based payment awards represent management's best estimates. The weighted-average grant-date fair value of options granted during the years ended December 31, 2023 and 20 was $3.27 per share and $5.41 and $33.00 for the years ended December 31, 2022 and 2021, per share, respectively. The weighted-average assumptions used in determining fair value of the sto options for the years ended December December 31, 2023 and 2022 and 2021, are as follows:

	Year ended December 31,		*Year Ended December 31,*	
	2022	2021	*2023*	*2022*
Expected option life (years)	6.0	6.0	***6.0***	***6.0***
Risk-free interest rate	2.06%	0.64%	***3.53%***	***2.06***
Expected volatility	113.25%	104.96%	***104.24%***	***113.25***
Expected dividend yield	-%	-%	***-%***	-

The expected life of the Company's options was determined using the simplified method as a result of limited historical data regarding the Company's activity. The risk-free interest rate was obtain from U.S. Treasury rates for the expected life of the stock options. The Company's expected volatility was based upon the weighted average of historical volatility for industry peers and its ov volatility. of the Company's common stock. The dividend yield considers that the Company has not historically paid dividends and does not expect to pay dividends in the foreseeable future.

As of December 31, 2022 December 31, 2023, there was $1.6 0.8 million of unrecognized stock-based compensation expense related to unvested stock options granted under the Company's sto award plans. This expense is expected to be recognized over a weighted-average period of approximately 2.0 years.

The following table presents total stock-based compensation expense for the years ended December 31, 2022 December 31, 2023 and 2021, respectively: 2022:

	Year Ended December 31,	
	2023	2022
Research and development	$ 243	$ 254
General and administrative	711	860
Total stock-based compensation expense	$ 954	$ 1,114

	Year ended December 31,	
	2022	2021
Research and development	$ 254	$ 217
General and administrative	860	941
Total stock-based compensation expense	$ 1,114	$ 1,158

11. 10. Commitments and Contingencies

Research and Development Activities

The Company contracts with various other organizations to conduct research and development activities, including clinical trials. As of December 31, 2022, the Company had aggregate commitmer to pay approximately $5.2 million remaining on these contracts, of which the Company expects to be reimbursed $2.5 million. Of the gross amount of $5.2 million in commitments, $4.2 million expected to be incurred over the next 12 months. The scope of the services under contracts for research and development activities may be modified and the contracts, subject to certain conditions, m generally be cancelled by the Company upon written notice. In some instances, the contracts, subject to certain conditions, may be cancelled by the third party. As of December 31, 2023, the Compa had no material noncancellable commitments not expected to be reimbursed under the Cipla Agreement.

Legal Proceedings

In the ordinary course of its business, the Company may be involved in various legal proceedings involving contractual and employment relationships, patent or other intellectual property rights, anc variety of other matters. The Company is not aware of any pending legal proceedings that would reasonably be expected to have a material impact on the Company's financial position or results operations.

12. 11. Leases

Current New Corporate Headquarters

The Company has limited leasing activities as a lessee and which are primarily related to its corporate headquarters, located which were relocated during the year ended December 31, 2023. On Janua 7, 2022, the Company executed a lease agreement with Cobalt Propco 2020, LLC for its new corporate headquarters at 99 Hayden Avenue, Suite 390, Lexington, 36 Crosby Drive, Bedfor Massachusetts. The lease is for leased premises comprise approximately 22,000 20,000square feet of office and lab space, under a lease with 99 Hayden LLC which was subsequently amended on Ap 30, 2020, October 6, 2021 and March 7, 2023, and will expire on the August 31, 2023. The lease provides for base rent of $0.1 million per month, payment of which began in March 2024, and whi will increase 3% each year over the ten-year noncancellable term. The Company has the option to extend the lease for one additional five-year term and is responsible for real estate taxes, maintenanc and other operating expenses applicable to the leased premises.

The lease commenced on August 1, 2023, following substantial completion of construction to prepare the premises for the Company's use, and the Company has included the lease as a component its operating lease right-of-use asset and operating lease liabilities upon commencement. The improvements to prepare the leased premises for the Company's intended use have been funded by (i) t landlord, through a tenant allowance of $3.9 million, (ii) a landlord-funded advance on tenant improvements of $0.5 million which will be repaid over the lease term, and (iii) approximately $2 million funded by the Company.

Other Leasing Activities

During the first quarter of 2023, the Company executed a two-month lease extension for its previous corporate headquarters in Lexington, Massachusetts, through August 31, 2023. The Compa terminated that lease extension, as planned, during the third quarter of 2023.

The Company also leases small office equipment which is primarily short-term or immaterial in nature. Therefore, no right-of-use assets and lease liabilities are recognized for these leases.

The components of lease expense for the Company for the years ended December 31, 2022 December 31, 2023 and 2021 2022 were as follows:

	Year Ended December 31,	
	2023	**2022**
Lease cost		
Fixed lease cost	$ 1,753	$ 1,430
Variable lease cost	593	695
Total lease cost	$ 2,346	$ 2,125
Other information		
Cash paid for amounts included in the measurement of lease liabilities	$ 3,454	$ 1,478
Weighted-average remaining lease term — operating leases	9.9 years	0.5 years
Weighted-average discount rate — operating leases	11.00 %	2.97

	Year ended December 31,	
	2022	**2021**
Lease cost		
Fixed lease cost	$ 1,430	$ 1,135
Variable lease cost	695	417
Total lease cost	$ 2,125	$ 1,552
Other information		
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	$ 1,478	$ 1,194
Right-of-use assets obtained in exchange for lease obligations:		
Operating leases	$ -	$ 1,671
Weighted-average remaining lease term — operating leases	0.5 years	
Weighted-average discount rate — operating leases	2.97 %	2.97

Maturities of lease liabilities due under these lease agreements as of December 31, 2022 December 31, 2023 are as follows:

	Operating Leases
Maturity of lease liabilities	
2023 (half year)	$ 862
Total lease payments	862
Less: interest	(5)
Total lease liabilities	$ 857

		Operating Leases
Reported as of December 31, 2022		
Maturity of lease liabilities		
2024		***$ 1,35***
2025		***1,32***
2026		***1,36***
2027		***1,40***
2028		***1,44***
2029 and thereafter		***7,71***
Total lease payments		***14,60***
Less: interest		***(5,84***
Total lease liabilities		***$ 8,75***
Reported as of December 31, 2023		
Lease liabilities — short term	***$ 857***	***$ 42***
Lease liabilities — long term	***-***	***8,32***
	$ 857	***$ 8,75***

On March 7, 2023, the Company executed an amendment to its lease agreement with 99 Hayden LLC. The amendment provides for base rent of $180 thousand per month from July 2023 to Augu 2023 and will expire on August 31, 2023.

Future Corporate Headquarters

On January 7, 2022, the Company executed a lease agreement with Cobalt Propco 2020, LLC for its new corporate headquarters at 36 Crosby Drive, Bedford, Massachusetts. The leased premis comprises approximately 20,000 square feet of office and lab space and is expected to commence in July 2023, following completion of construction to prepare the premises for the Company's intend use. Based on the Company's current plans, management anticipates the improvements will be funded by (i) the landlord through a tenant allowance of $3.9 million, (ii) a landlord-funded advance tenant improvements of $0.5 million which will be repaid over the lease term, and (iii) approximately $3.0 million by the Company to be paid during the construction period. The lease provides f base rent of $101 thousand per month, which will increase 3% each year over the ten-year noncancellable term. The Company has the option to extend the lease for one additional five-year term and responsible for real estate taxes, maintenance, and other operating expenses applicable to the leased premises.

As of December 31, 2022, the lease was not recorded on the consolidated balance sheet as the facility is under construction and no payments relating to landlord-owned leasehold improvements ha been made by the Company. When payments are made by the Company relating to landlord-owned leasehold improvements, they will be recorded to prepaid rent as a component of other long-te assets. On the lease commencement date, the Company plans to reclassify the prepayment to the right-of-use asset, thereby increasing its initial value, but the prepayment will not be included in t measurement of the lease liability. The lease will be recorded as a component of the Company's right-of-use asset and operating lease liabilities when the lease commencement date occurs.

13. 12.Income Taxes

The Company had no income tax expense due to operating losses incurred for the years ended December 31, 2022 December 31, 2023 and 2021 2022.

A reconciliation of the provision for income taxes computed at the statutory federal income tax rate to the provision for income taxes as reflected in the consolidated financial statements is as follows:

	2022		*2021*	*2023*	*2022*
Income tax computed at federal statutory tax rate	***21.0***	***%***	***21.0%***	***21.0%***	***21.0%***
State taxes, net of federal benefit	***6.0***	***%***	***5.0%***	***5.9%***	***6.0%***
Research and development credits	***4.9***	***%***	***1.8%***	***7.9%***	***4.9%***
Expiration of stock options	***(2.5***	***)%***	***(0.3)%***	***(3.1)%***	***(2.5)***
Write-down of goodwill assets	***-***	***%***	***(3.7)%***		
Permanent differences	***0.9***	***%***	***(0.3)%***	***1.4%***	***0.9%***
Limitations on credits and net operating losses		***(0.8)%***	***(16.3)%***	***(1.7)%***	***(0.8)***
Change in valuation allowance	***(29.5***	***)%***	***(7.2)%***	***(31.4)%***	***(29.5)***
	-		*-*	*-*	*-*

The significant components of the Company's deferred tax assets as of December 31, 2022 December 31, 2023 and 2021 2022 were as follows:

	2023	**2022**
Deferred tax assets:		
Net operating loss carryforwards	$ 12,866	$ 11,557
Capitalized research and development expenses	7,642	4,460
Lease liability	2,977	234
Research and development credit carryforwards	1,528	698
Stock-based compensation	873	860
Capitalized start-up expenses	153	293
Other	1,303	2,206
Total deferred tax assets	27,342	20,308
Deferred tax liabilities:		
Right-of-use-asset	(2,816)	(194)
Total deferred tax liabilities	(2,816)	(194)
Valuation allowance	(24,526)	(20,114)
Net deferred tax liabilities	$ -	$ -

	2022	**2021**
Deferred tax assets:		
Net operating loss carryforwards	$ 11,557	$ 10,836
Capitalized research and development expenses	4,460	-
Research and development credit carryforwards	698	12
Capitalized start-up expenses	293	432
Stock-based compensation	860	815
Lease liability	234	625
Other	2,206	2,415
Total deferred tax assets	20,308	15,135
Deferred tax liabilities:		
Right-of-use-asset	(194)	(572)
Total deferred tax liabilities	(194)	(572)
Valuation allowance	(20,114)	(14,563)
Net deferred tax liabilities	$ -	$ -

Subject to the limitations described below, as of December 31, 2022 December 31, 2023, the Company had federal net operating loss carryforwards of approximately $53.2 58.1 million available reduce future taxable income, of which $3.8 million $3.8 million is subject to expiration between 2026 and 2037 and $49.4 million $54.3 million may be carried forward indefinitely indefinitely.. As December 31, 2022 December 31, 2023, the Company had state net operating loss carryforwards of approximately $6.0 10.5million, which is subject to expiration between 2030 and 2042 2043.. T Company also had research and development credits of approximately $0.7 1.6million as of December 31, 2022 December 31, 2023 to offset future federal and state income taxes, which is subject expiration at various times through 2042 2043.

Under the provisions of the Internal Revenue Code, the net operating loss and tax credit carryforwards are subject to review and possible adjustment by the Internal Revenue Service and state t authorities. Net operating loss and tax credit carryforwards may become subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant shareholde over a three-year period in excess of 50percent, as defined under Sections 382 and 383 of the Internal Revenue Code, respectively, as well as similar state provisions. This could limit the amount of t attributes that can be utilized annually to offset future taxable income or tax liabilities. The amount of the annual limitation is determined based on the value of the Company immediately prior to t ownership change. Subsequent ownership changes may further affect the limitation in future years. The Company has completed several financings since its inception which it believes has resulted changes in control as defined by Sections 382 and 383 of the Internal Revenue Code.

Management of the Company evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets and determined that it is more likely than not that the Company w not recognize the benefits of the deferred tax assets. As a result, a full valuation allowance was recorded as of December 31, 2022 December 31, 2023 and 2021. 2022. The valuation allowan increased by $5.6 4.4 million during the year ended December 31, 2022 December 31, 2023, primarily due to the capitalization of research and development expenses and increase in loss carryforwar by the Company.

As part of the Tax Cuts and Jobs Act that was enacted in December of 2017, taxpayers are required to capitalize research and development expenses and amortize them over five years if the expense incurred in the US and over fifteen years if incurred in a foreign jurisdiction. The effective date for that provision is for tax years beginning on or after January 1, 2022. The new capitalizati requirement increased deferred tax assets related to research and development expenses and decreased taxable loss in the current year, both of which were offset by a full valuation allowance.

The Coronavirus Aid, Relief, and Economic Security (CARES) Act was enacted March 27, 2020. Among the business provisions, the CARES Act provided for various payroll tax incentives, chang to net operating loss carryback and carryforward rules, business interest expense limitation increases, and bonus depreciation on qualified improvement property. Additionally, the Consolidat Appropriations Act of 2021 was signed on December 27, 2020 which provided additional COVID relief provisions for businesses. The Company has evaluated the impact of both Acts and h determined that any impact is not material to its consolidated financial statements.
The Company applies ASC 740,*Income Taxes*, for the financial statement recognition, measurement, presentation, and disclosure of uncertain tax positions taken or expected to be taken in income t returns. Unrecognized tax benefits represent tax positions for which reserves have been established. A full valuation allowance has been provided against the Company's deferred tax assets, so that t effect of the unrecognized tax benefits is to reduce the gross amount of the deferred tax asset and the corresponding valuation allowance.

The Company is currently not under examination by the Internal Revenue Service or any other jurisdictions for any tax years. The Company files income tax returns in the United States for federal a state income taxes. In the normal course of business, the Company is subject to examination by tax authorities in the United States. Since the Company is in a loss carryforward position, the Compa is generally subject to U.S. federal and state income tax examinations by tax authorities for all years for which a loss carryforward is utilized. The Company's returns remain subject to federal and sta audits for the years 2019 2020 through 2022. 2023. However, carryforward attributes from prior years may still be adjusted upon examination by tax authorities if they are used in an open period.

The Company may from time to time be assessed interest or penalties by major tax jurisdictions. The Company recognizes interest and penalties related to uncertain tax positions in income tax expens The Company has not recorded interest or penalties on any unrecognized tax benefits since its inception.

The Company anticipates that the amount of unrecognized tax benefits will not materially change in the next twelve months.

The roll-forward of the Company's gross uncertain tax positions is as follows:

	Gross Uncertain Tax Position
Balance — January 1, 2022	$ -
Additions for current year tax positions	229
Balance — December 31, 2022	229
Additions for current year tax positions	276
Balance — December 31, 2023	$ 505

	Gross Uncertain Tax Position
Balance — January 1, 2021	$ 0
Additions for current year tax positions	130
Reductions for prior year tax positions	(130)
Balance — December 31, 2021	-
Additions for current year tax positions	229
Balance — December 31, 2022	$ 229

The Company's total uncertain tax positions increased during the year ended December 31, 2022 December 31, 2023 as a result of a reserve established on federal and state research and developme credits generated in the current year. None of the uncertain tax positions, that, if realized, would affect the Company's effective tax rate in future periods due to a valuation allowance provided agai the Company's net deferred tax assets.

14. 13. Net Loss Per Share

Basic and diluted earnings (loss) per share are computed using the two-class method, which is an earnings allocation method that determines earnings (loss) per share for common shares a participating securities. The participating securities consist of the Company's preferred stock. Series A Preferred Stock. The undistributed earnings are allocated between common shares a participating securities as if all earnings had been distributed during the period. In periods of loss, no allocation is made to the preferred shares Series A Preferred Stock and diluted net loss per share the same as basic net loss per share because common stock equivalents are excluded as their inclusion would be anti-dilutive. antidilutive.

The following potentially dilutive securities outstanding have been excluded from the computation of diluted weighted-average shares outstanding, because such securities had an antidilutive impact:

	Year ended December 31,		Year Ended December 31,	
	2022	2021	2023	2022
Options to purchase common stock	304,823	196,004	344,306	304,82
Preferred stock convertible into common stock	-	152,500		
Warrants to purchase common stock	1,284,803	1,539,745	1,161,493	1,284,80
	1,589,626	1,888,249		
Total potentially dilutive securities excluded			1,505,799	1,589,62

15. 14. Subsequent Events

The Company has completed an evaluation of all subsequent events after the balance sheet date of December 31, 2022 December 31, 2023 through the date the consolidated financial statements we issued to ensure that the consolidated financial statements include appropriate disclosure of events both recognized in the consolidated financial statements as of December 31, 2022 December 31, 202 and events which occurred subsequently but were not recognized in the consolidated financial statements. The Company has concluded that no subsequent events have occurred that require disclosu except as disclosed within the consolidated financial statements.

Exhibit 23

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM'S CONSENT

We consent to the incorporation by reference in the Registration Statement of Pulmatrix, Inc. on Form S-1 (File Nos. 333-223630, 333-230670, 333-239431, and 333-230395, and the relat registration statement (File No. 333-230714) filed under Rule 462(b)), Forms S-3 (File Nos. 333-212546, 333-230225, 333-242341 and 333-256502) and Forms S-8 (File Nos. 333-263957, 33 195737, 333-205752, 333-207002, 333-212547, 333-216628, 333-225627, 333-231935, and 333-252439) of our report, dated March 30, 2023 March 28, 2024 with respect to our audits of t consolidated financial statements of Pulmatrix, Inc. as of December 31, 2022 December 31, 2023 and 2021 2022 and for each of the two years in the period ended December 31, 2022 December 3 2023, which report is included in this Annual Report on Form 10-K of Pulmatrix, Inc. for the year ended December 31, 2022 December 31, 2023.

/s/ Marcum LLP

Marcum LLP
New York, NY
March 30, 2023 28, 2024

Exhibit 31

CERTIFICATION PURSUANT TO
SECURITIES EXCHANGE ACT RULES 13a-14 and 15d-14
AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Teofilo Raad, President and Chief Executive Officer, certify that:

1. I have reviewed this Annual Report on Form 10-K of Pulmatrix, 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 unc 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 ca 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)) a 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 t 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 regardi 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 procedur 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 quar 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 t 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 abil 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 30, 2023 March 28, 2024

/s/ Teofilo Raad
Teofilo Raad
President & Chief Executive Officer
(Principal Executive Officer)

Exhibit 31

CERTIFICATION PURSUANT TO
SECURITIES EXCHANGE ACT RULES 13a-14 and 15d-14
AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Peter Ludlum, Interim Chief Financial Officer, certify that:

1. I have reviewed this Annual Report on Form 10-K of Pulmatrix, 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 und 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 ca 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)) a 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 t 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 regardi 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 procedur 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 quart 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 t 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 abil 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 30, 2023 March 28, 2024

/s/ Peter Ludlum
Peter Ludlum
Interim Chief Financial Officer
(Principal Financial and Accounting Officer)

Exhibit 32

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Pulmatrix, Inc. (the "Company") for the period ended December 31, 2022 December 31, 2023 as filed with the Securities and Exchan Commission on the date hereof (the "Report"), I, the undersigned, Teofilo Raad, as the President & Chief Executive Officer of the Company, do hereby certify, pursuant to 18 U.S.C. Section 1350, adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

(1) 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.

Date: March 30, 2023 March 28, 2024

/s/ Teofilo Raad
Teofilo Raad
President & Chief Executive Officer
(Principal Executive Officer)

The foregoing certification is being furnished solely pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Coc and is not being filed as part of the Form 10-K or as a separate disclosure document.

Exhibit 32

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Pulmatrix, Inc. (the "Company") for the period ended December 31, 2022 December 31, 2023 as filed with the Securities and Exchan Commission on the date hereof (the "Report"), I, the undersigned, Peter Ludlum, as the Interim Chief Financial Officer of the Company, do hereby certify, pursuant to 18 U.S.C. Section 1350, adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

(1) 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.

Date: March 30, 2023 March 28, 2024

/s/ Peter Ludlum
Peter Ludlum
Interim Chief Financial Officer
(Principal Financial and Accounting Officer)

The foregoing certification is being furnished solely pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Coc and is not being filed as part of the Form 10-K or as a separate disclosure document.

Exhibit 97.

PULMATRIX, INC.
Compensation Recovery Policy

This Compensation Recovery Policy (this "***Policy***") of Pulmatrix, Inc. (the "***Company***") is hereby adopted as of November 30, 2023 in compliance with Rule 5608 of the Nasdaq Rule Certain terms used herein shall have the meanings set forth in "*Section 3. Definitions*" below.

Section 1. Recovery Requirement

Subject to Section 4 of this Policy, in the event the Company is required to prepare an Accounting Restatement, then the Board and Committee hereby direct the Company, to the fullest extent permitt by governing law, to recover from each Executive Officer the amount, if any, of Erroneously Awarded Compensation received by such Executive Officer, with such recovery occurring reasonab promptly after the Restatement Date relating to such Accounting Restatement.

The Board or the Committee may effect recovery in any manner consistent with applicable law including, but not limited to, (a) seeking reimbursement of all or part of Erroneously Award Compensation previously received by an Executive Officer, together with any expenses reasonably incurred as described below in connection with the recovery of such Erroneously Award Compensation, (b) cancelling prior grants of Incentive-Based Compensation, whether vested or unvested, restricted or deferred, or paid or unpaid, and through the forfeiture of previously vested equi awards, (c) cancelling or setting-off against planned future grants of Incentive-Based Compensation, (d) deducting all or any portion of such Erroneously Awarded Compensation from any oth remuneration payable by the Company to such Executive Officer, and (e) any other method authorized by applicable law or contract.

To the extent that an Executive Officer fails to repay all Erroneously Awarded Compensation to the Company when due, the Company shall take all actions reasonable and appropriate to recover su Erroneously Awarded Compensation from the applicable Executive Officer. The applicable Executive Officer shall be required to reimburse the Company for any and all expenses reasonably incurr (including legal fees) by the Company in recovering such Erroneously Awarded Compensation in accordance with the immediately preceding sentence.

The Company's right to recovery pursuant to this Policy is not dependent on if or when the Accounting Restatement is filed with the SEC.

Section 2. Incentive-Based Compensation Subject to this Policy

This Policy applies to all Incentive-Based Compensation received by each Executive Officer on or after the Effective Date:

(i) if such Incentive-Based Compensation was received on and after the date such person became an Executive Officer of the Company;

(ii) if such Executive Officer served as an Executive Officer at any time during the performance period for such Incentive-Based Compensation;

(iii) while the Company has a class of securities listed on a national securities exchange or a national securities association; and

(iv) during the three completed fiscal years immediately preceding the date that the Company is required to prepare an Accounting Restatement (including any transition period that resu from a change in the Company's fiscal year that is within or immediately following those three completed fiscal years; provided that a transition period of nine to 12 months is deemed to be completed fiscal year).

This Policy shall apply and govern Incentive-Based Compensation received by any Executive Officer, notwithstanding any contrary or supplemental term or condition in any document, plan agreement including, without limitation, any employment contract, indemnification agreement, equity or bonus agreement, or equity or bonus plan document.

Section 3. Definitions:

For purposes of this Policy, the following terms have the meanings set forth below:

- "***Accounting Restatement***" means an accounting restatement due to the material noncompliance of the Company with any financial reporting requirement under the securities laws, includi any required accounting restatement to correct an error (i) in previously issued financial statements that is material to the previously issued financial statements (commonly referred to as "Big R" restatement), or (ii) that would result in a material misstatement if the error were corrected in the current period or left uncorrected in the current period (commonly referred to as "little r" restatement).
- "***Board***" means the Board of Directors of the Company.
- "***Committee***" means the Compensation Committee of the Board.
- "***Effective Date***" means October 2, 2023.

- "***Erroneously Awarded Compensation***" means the amount of Incentive-Based Compensation received that exceeds the amount of Incentive-Based Compensation that otherwise would hav been received by the Executive Officer had it been determined based on the restated amounts in the Accounting Restatement (computed without regard to any taxes paid). For Incentive-Bas Compensation based on stock price or total shareholder return ("***TSR***"), where the amount of Erroneously Awarded Compensation is not subject to mathematical recalculation directly fro the information in the Accounting Restatement, the Company shall: (i) base the calculation of the amount on a reasonable estimate of the effect of the Accounting Restatement on the sto price or TSR upon which the Incentive-Based Compensation received was based; and (ii) retain documentation of the determination of that reasonable estimate and provide su documentation to The Nasdaq Stock Market LLC ("***Nasdaq***") or, if a class of securities of the Company is no longer listed on Nasdaq, such other national securities exchange or nation securities association on which a class of the Company's securities is then listed for trading.
- "***Executive Officer***" means the Company's current and former executive officers, as determined by the Board or the Committee in accordance with the definition of executive officer set for in Rule 5608(d) of the Nasdaq Rules.
- "***Financial Reporting Measures***" means measures that are determined and presented in accordance with the accounting principles used in preparing the Company's financial statements, a any measures that are derived wholly or in part from such measures. Stock price and TSR are also Financial Reporting Measures. A Financial Reporting Measure need not be presented with the Company's financial statements or included in any of the Company's filings with the SEC.
- "***Incentive-Based Compensation***" means any compensation that is granted, earned, or vested based wholly or in part upon the attainment of a Financial Reporting Measure (includin without limitation, any cash bonuses, performance awards, restricted stock awards or restricted stock unit awards that are granted, earned or vest based on achievement of a Financi Reporting Measure). The following do not constitute Incentive-Based Compensation for purposes of this Policy: (a) equity awards for which (1) the grant is not contingent upon achieving a Financial Reporting Measure performance goals and (2) vesting is contingent solely upon completion of a specified employment period and/or attaining one or more nonfinancial reporti measures, and (b) bonus awards that are discretionary or based on subjective goals or goals unrelated to Financial Reporting Measures.
- "***Nasdaq Rules***" means the listing rules of The Nasdaq Stock Market LLC.
- "***received***": An Executive Officer shall be deemed to have "received" Incentive-Based Compensation in the Company's fiscal period during which the Financial Reporting Measure specifi in the Incentive-Based Compensation award is attained, even if the payment or grant of the Incentive-Based Compensation occurs after the end of that fiscal period.
- "***Restatement Date***" means the earlier to occur of (i) the date the Board or the Committee (or an officer or officers of the Company authorized to take such action if Board action is n required) concludes, or reasonably should have concluded, that the Company is required to prepare an Accounting Restatement and (ii) the date a court, regulator, or other legally authoriz body directs the Company to prepare an Accounting Restatement.
- "***SEC***" means the U.S. Securities and Exchange Commission.

Section 4. Exceptions to Recovery

Notwithstanding the foregoing, the Company is not required to recover Erroneously Awarded Compensation to the extent that the Committee, or in the absence of such committee, a majority of t independent directors serving on the Board has made a determination that recovery would be impracticable and that:

(i) after the Company has made a reasonable attempt to recover such Erroneously Awarded Compensation (which has been documented and such documentation has been provided to Nasdac the direct expense paid to a third party to assist in enforcing this Policy would exceed the amount to be recovered;

(ii) recovery would violate one or more laws of the home country that were adopted prior to November 28, 2022 (which determination shall be made after the Company obtains an opinion home country counsel, acceptable to Nasdaq, that recovery would result in a such a violation, and a copy of such opinion is provided to Nasdaq);

(iii) recovery would likely cause an otherwise tax-qualified retirement plan, under which benefits are broadly available to employees of the Company and its subsidiaries, to fail to meet t requirements of 26 U.S.C. 401(a)(13) or 26 U.S.C. 411(a) and regulations thereunder; or

(iv) any other exception permitted under Rule 5608(b)(1)(iv) of the Nasdaq Rules.

Section 5. Right to Adjust Unvested Incentive-Based Compensation

If the Board or the Committee, in its sole discretion, determines that the performance metrics of outstanding but unvested Incentive-Based Compensation issued after the Effective Date were establish using Financial Reporting Measures that were impacted by the Accounting Restatement, the Board or the Committee, in its sole discretion, may adjust such Financial Reporting Measures or modi such Incentive-Based Compensation, in such manner as the Board or the Committee determines, in its sole discretion, to be appropriate.

Section 6. No Right to Indemnification or Insurance

The Company shall not indemnify any Executive Officer against the loss of Erroneously Awarded Compensation or losses arising from any claims relating to the Company's enforcement of this Poli In addition, the Company shall not pay, or reimburse any Executive Officer for, any premiums for a third-party insurance policy purchased by the Executive Officer or any other party that would fu any of the Executive Officer's potential recovery obligations under this Policy.

Section 7. Plan Documents and Award Agreements

The Board further directs the Company to include clawback language in each of the Company's incentive compensation plans and any award agreements such that each individual who receiv Incentive-Based Compensation under those plans understands and agrees that all or any portion of such Incentive-Based Compensation may be subject to recovery by the Company, and such individu may be required to repay all or any portion of such Incentive-Based Compensation, if (i) recovery of such Incentive-Based Compensation is required by this Policy, (ii) such Incentive-Bas Compensation is determined to be based on materially inaccurate financial and/or performance information (which includes, but is not limited to, statements of earnings, revenues or gains), or (i repayment of such Incentive-Based Compensation is required by applicable federal or state securities laws.

Section 8. Interpretation and Amendment of this Policy

The Board or the Committee, in its discretion, shall have the sole authority to interpret and make any determinations regarding this Policy. Any interpretation, determination, or other action made taken by the Committee (or, if applicable, the Board) shall be final, binding, and conclusive on all interested parties. The determination of the Committee (or, if applicable, the Board) need not uniform with respect to one or more officers of the Company. The Board or the Committee may amend this Policy from time to time in its discretion and shall amend the Policy to comply with a rules or standards adopted by Nasdaq or any national securities exchange on which the Company's securities are then listed.

Section 9. Filing Requirement

The Company shall file this Policy as an exhibit to its Annual Report on Form 10-K and make such other disclosures with respect to this Policy in accordance with the requirements of the feder securities laws, including the disclosure required by applicable SEC rules and regulations.

Section 10. Other Recoupment Rights

The Company intends that this Policy will be applied to the fullest extent of the law. Any right of recoupment under this Policy is in addition to, and not in lieu of, any other remedies or rights recoupment that may be available to the Company pursuant to the terms of any similar policy in any employment agreement, equity award agreement, or similar agreement and any other remedi available to the Company under applicable law. Without by implication limiting the foregoing, following a restatement of the Company's financial statements, the Company also shall be entitled recover any compensation received by the Chief Executive Officer and Chief Financial Officer that is required to be recovered by Section 304 of the Sarbanes-Oxley Act of 2002.

Section 11. Successors

This Policy shall be binding and enforceable against all Executive Officers and their respective beneficiaries, heirs, executors, administrators or other legal representatives.

DISCLAIMER

THE INFORMATION CONTAINED IN THE REFINITIV CORPORATE DISCLOSURES DELTA REPORT™ IS A COMPARISON OF TWO FINANCIALS PERIODIC REPORTS. THERE MAY BE MATERIAL ERRORS, OMISSIONS, OR INACCURACIES IN THE REPORT INCLUDING THE TEXT AND THE COMPARISON DATA AND TABLES. IN NO WAY DOES REFINITIV OR THE APPLICABLE COMPANY ASSUME ANY RESPONSIBILITY FOR ANY INVESTMENT OR OTHER DECISIONS MADE BASED UPON THE INFORMATION PROVIDED IN THIS REPORT. USERS ARE ADVISED TO REVIEW THE APPLICABLE COMPANY'S ACTUAL SEC FILINGS BEFORE MAKING ANY INVESTMENT OR OTHER DECISIONS.

REFINITIV