As filed with the Securities and Exchange Commission on January 21, 2020

Registration No. 333-

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

FORM S-1
REGISTRATION STATEMENT UNDER
THE SECURITIES ACT OF 1933

Windtree Therapeutics, Inc.
(Exact name of registrant as specified in its charter)

Delaware	**2836**	**94-3171943**
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

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Warrington, Pennsylvania 18976
(215) 488-9300
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

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Approximate date of commencement of proposed sale to the public: From time to time after this registration statement is declared effective.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box. ☒

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

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	☐	Emerging growth company	☐
Non-accelerated filter	☒	Smaller reporting company	☒		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

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CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Amount to be Registered[(1)]	Proposed Maximum Offering Price per Share[(2)]	Proposed Maximum Aggregate Offering Price[(2)]	Amount of Registration Fee
Common Stock, $0.001 par value per share	13,221,430	$ 3.87	$ 51,166,934.10	$ 6,641.47

(1) The Registrant is registering for resale by the selling stockholders identified in the prospectus contained herein up to 13,221,430 shares of common stock, which consists of: (i) 8,846,428 shares of common stock and (ii) 4,375,002 shares of common stock issuable upon exercise of common stock purchase warrants held by the selling stockholders. Pursuant to Rule 416 under the Securities Act of 1933, as amended, the shares of common stock registered hereby also include an indeterminate number of additional shares of common stock as may from time to time become issuable by reason of stock splits, stock dividends, recapitalizations or other similar transactions.

(2) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(c) under the Securities Act of 1933, as amended, based on the average of the high and low prices of our common stock on The OTCQB® Market on January 15, 2020.

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until this Registration Statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

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The information in this prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting offers to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated January 21, 2020

13,221,430 Shares

COMMON STOCK

This prospectus relates solely to the resale of up to 13,221,430 shares of our common stock, par value $0.001 per share, or common stock, which may be offered for sale from time to time by the selling stockholders identified in this prospectus, or selling stockholders. The shares of common stock covered by this prospectus consist of (i) 8,846,428 shares of common stock, or common shares, and (ii) 4,375,002 of common stock, or warrant shares, issuable upon exercise of our Series I Warrants to purchase common stock, or warrants. The common shares and the warrants were issued by us to the selling stockholders in an offering exempt from registration under the Securities Act of 1933, as amended, or Securities Act. We are hereby registering the offer and sale of the common shares and the warrant shares to satisfy registration rights that we have granted to the selling stockholders in connection with such offering.

The common stock offered by this prospectus may be sold, transferred or otherwise disposed of by the selling stockholders or their transferees, pledgees, donees or assigns or other successors-in-interest that receive any of the shares as a gift, distribution, or other non-sale related transfer from time to time in the over-the-counter market or any other national securities exchange or automated interdealer quotation system on which our common stock is then listed or quoted, through negotiated transactions or otherwise at market prices prevailing at the time of sale or at negotiated prices, as described under “Plan of Distribution” herein.

We are not selling any shares of our common stock and we will not receive any proceeds from the sale of shares of our common stock by the selling stockholders. However, upon a cash exercise of the warrants by the selling stockholders, we will receive cash proceeds per share equal to the exercise price per share of the warrants. The warrants have a per share exercise price of $4.03. If the warrants are exercised in a cashless exercise, we will not receive any proceeds from the exercise of the warrants. We have agreed to pay certain registration expenses, other than underwriting discounts and commissions.

There is currently a limited public trading market for our common stock. Because all of the shares of common stock being offered in this prospectus are being offered by the selling stockholders, we cannot currently determine the price or prices at which these shares may be sold.

We may amend or supplement this prospectus from time to time by filing amendments or supplements as required. You should read this entire prospectus and any amendments or supplements carefully before you make your investment decision.

Our common stock is currently traded on The OTCQB® Market (OTCQB) under the symbol WINT. On January 17, 2020, the last reported sale price of our common stock that was reported on The OTCQB® Market was $4.19 per share.

Investing in our common stock involves significant risks. See “Risk Factors” beginning on page 7 of this prospectus.

Neither the Securities and Exchange Commission (the SEC) nor any state securities commission has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is , 2020

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You should rely only on the information contained in this prospectus and any related free writing prospectus that we may provide to you in connection with this offering. We have not, and the selling stockholders have not, authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not, and the selling stockholders are not, making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus is accurate only as of the date on the front cover of this prospectus. Our business, financial condition, results of operations and prospects may have changed since that date. Neither the delivery of this prospectus nor any sale made in connection with this prospectus shall, under any circumstances, create any implication that there has been no change in our affairs since the date of this prospectus or that the information contained in this prospectus is correct as of any time after its date. Information contained on our website, or any other website operated by us, is not part of this prospectus.

For investors outside the United States: neither we nor the selling stockholders have done anything that would permit this offering or possession or distribution of this prospectus or any free writing prospectus we may provide to you in connection with this offering in any jurisdiction where action for that purpose is required, other than in the United States of America, or the U.S. persons outside the U.S. who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of our common stock and the distribution of this prospectus and any such free writing prospectus outside of the U.S.

We use "Windtree Therapeutics," as our trademark, and we have been granted a trademark or have a trademark application on file with the United States Patent and Trademark Office. All trademarks or trade names referred to in this prospectus are the property of their respective owners. Solely for convenience, the trademarks and trade names in this prospectus are referred to without the ® and ™ symbols, but such references should not be construed as any indicator that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto. We do not intend the use or display of other companies' trademarks and trade names to imply a relationship with, or endorsement or sponsorship of us, by any other companies.

This prospectus contains forward-looking statements that are subject to a number of risks and uncertainties, many of which are beyond our control. See "Risk Factors" and "Cautionary Note Regarding Forward-Looking Statements."

Unless the context otherwise requires, references in this prospectus to "Windtree," "Windtree Therapeutics," "the Company," "we," "our," and "us" refer to Windtree Therapeutics, Inc., a Delaware corporation, and its consolidated subsidiaries.

PROSPECTUS SUMMARY

This summary highlights information contained in other parts of this prospectus. This summary is not complete and does not contain all of the information that you should consider in making your investment decision. Before investing in our common stock, you should carefully read this entire prospectus carefully including "Risk Factors" included in this prospectus at page 13 and the financial statements and the notes to those financial statements in this prospectus.

When used herein, unless the context requires otherwise, references to "Windtree," "Windtree Therapeutics," "the Company," "we," "our" and "us" refer to Windtree Therapeutics, Inc.

Overview

We are a clinical-stage, biopharmaceutical and medical device company focused on the development of novel therapeutics intended to address significant unmet medical needs in important acute care markets. Our development programs are primarily focused in the treatment of acute cardiovascular and pulmonary diseases. Our lead cardiovascular product candidate, istaroxime, is a first-in-class, dual-acting agent being developed to improve cardiac function in patients with acute heart failure, or AHF, and cardiogenic shock with a potentially differentiated safety profile from existing treatments. Istaroxime has been granted Fast Track designation for the treatment of AHF by the U.S. Food and Drug Administration, or FDA. Our lead pulmonary product candidate is AEROSURF® (lucinactant for inhalation), a novel drug/medical device combination for non-invasive delivery of our proprietary aerosolized KL4 surfactant, using our proprietary Aerosol Delivery System, or ADS, technology for the treatment of respiratory distress syndrome, or RDS, in premature infants. AEROSURF has been granted Fast Track designation by the FDA for the treatment of RDS. Our other clinical programs include a lyophilized, or freeze-dried, KL4 surfactant intratracheal suspension for the treatment of RDS and rostafuroxin, a novel medicine for genetically associated hypertension.

Our Development Programs

The table below summarizes the current status and anticipated milestones for our principal product development programs.

Product Candidate	Indication	Status	Next Expected Milestone
Istaroxime	AHF	Phase 2b	Initiate start-up activities for second phase 2b clinical trial in ~300 patients in second half of 2020.
Istaroxime	Early Cardiogenic Shock	Phase 2a	Initiate phase 2a clinical trial in ~60 patients first half of 2020.
AEROSURF (aerosolized KL4 surfactant)	RDS	Phase 2b	Initiate in first quarter of 2020 a ~90-patient bridging study with new ADS (developed for use in our phase 3 program), relying on licensee resources.
Rostafuroxin	Genetically Associated Hypertension	Phase 2b	Out-licensing.
Lyophilized KL4 Surfactant	RDS (intratracheal instillate)	Phase 2	Development program under consideration.

Istaroxime (Acute Heart Failure)

Istaroxime is a first-in-class dual action investigational drug that we are developing to treat AHF with a potentially differentiated safety profile from current AHF therapies. We recently completed a successful phase 2b clinical trial of istaroxime in which the primary endpoint of cardiac function, E/Ea ratio (echocardiographic assessment reflecting changes in pulmonary capillary wedge pressure, or PCWP, or left ventricular filing pressure), was significantly improved. Istaroxime has been granted Fast-Track designation by the FDA for the treatment of AHF.

Heart failure is a chronic, progressive condition in which patients often experience episodic periods of increased symptoms known as AHF, where the heart fails to adequately pump, resulting in worsening symptoms, including pulmonary and peripheral edema and other severe complications. In the United States, approximately 6 million people (nearly two percent of the adult population) have heart failure and approximately half of these patients are expected to die within 5 years of diagnosis; and in the combined U.S., European Union, or EU, and Japan markets, there are over 18 million patients suffering from heart failure. We estimate that AHF may represent a potential addressable market of approximately $1.6 billion dollars annually (in the U.S., EU and Japan).

We plan to initiate start-up activities for an additional phase 2b clinical trial of istaroxime in the second half of 2020 in patients with low systolic blood pressure and those who are diuretic resistant. We also plan to extend dosing in this clinical trial beyond what was previously studied and include clinical outcome measures that we believe will support the further development of istaroxime.

Istaroxime (Cardiogenic Shock)

We are also exploring istaroxime for the treatment of early cardiogenic shock, a severe presentation of heart failure characterized by very low blood pressure and hypo-perfusion to critical organs which is associated with high mortality and morbidity and is not well treated with current therapies. We believe istaroxime may fulfill an unmet need in cardiogenic shock based on the profile observed in our phase 2 clinical studies in AHF. Because of the unmet need in the treatment of early cardiogenic shock, we believe there may be an opportunity with a Breakthrough Therapy designation, which may provide an expedited development program, based on FDA published positions and precedents for cardiogenic shock therapeutic development and approval. Receipt of either Fast Track or Breakthrough Therapy designation may increase the likelihood of receiving priority review of a marketing application, which would provide for an expedited review timeframe.

In the first half of 2020, we plan to initiate a small study of istaroxime in early cardiogenic shock patients to evaluate the potential to improve blood pressure and organ perfusion. The study will also evaluate the safety and side effect profile of istaroxime in this patient population.

AEROSURF (lucinactant for inhalation)

AEROSURF is an investigational combination drug/medical device that we are developing to improve the management of RDS in premature infants. RDS is a condition that occurs in premature infants who may not have fully-developed natural lung surfactant, which is essential to normal respiratory function and survival, and may require surfactant therapy to sustain life, and can result in long-term respiratory problems, developmental delays and death. RDS is the most prevalent respiratory disease in the neonatal intensive care unit, or NICU. Surfactant therapy is the primary therapy to address an underlying surfactant deficiency, and AEROSURF is designed to deliver aerosolized KL4 surfactant noninvasively using our proprietary ADS technology. We have completed three AEROSURF phase 2 clinical trials. While our most recent phase 2 clinical trial did not achieve its primary endpoint, we believe the results of our phase 2 clinical program support the further development of AEROSURF to reduce both the rate of nasal continuous positive airway pressure, or nCPAP, failure and the need for intubation in premature infants being treated for RDS. In addition, a pooled post-hoc analysis of data from two phase 2 studies suggests that AEROSURF may have the potential to lower the incidence and severity of bronchopulmonary dysplasia, or BPD, a chronic lung disease of premature infants who have required intubation, mechanical ventilation and oxygen therapy. AEROSURF has been granted Fast-Track designation by the FDA for the treatment of RDS. We also believe that AEROSURF, if approved, may be administered in less specialized hospitals and birthing centers, potentially further expanding access to treatment. We also believe AEROSURF has the potential to achieve a higher price per patient in an addressable market that could be in excess of $1 billion annually.

We recently completed design verification activities for a newly-designed ADS, which combines the same aerosolization technology used during the phase 2 clinical program, but with improved ergonomics, interface, controls, and dose monitoring in a modular design. We believe it will be easier and faster to use and may support enhanced clinical outcomes by potentially allowing for reduced time to initial administration of our KL4 surfactant and reduced time intervals between doses compared to our phase 2 prototype.

In the first quarter of 2020, we plan to commence a small, approximately 90-patient, phase 2 bridging study and prepare to transition to our phase 3 clinical program by demonstrating the new ADS performance in the NICU. This trial will not be powered to establish statistical significance but will generate clinical experience with the new ADS as well as additional higher dose treatment data to augment data previously obtained in the phase 2 clinical program. We expect to advance the bridging study at a reduced cost to us by leveraging development opportunities in the People's Republic of China, or China (the largest RDS and surfactant market), with our licensee in the region.

Rostafuroxin

Rostafuroxin is a novel investigational drug product candidate that we are developing for the treatment of hypertension in patients with a specific genetic profile. Rostafuroxin targets resistant hypertensive patients with a specific genetic profile, which is found in approximately 20% – 25% of the adult hypertensive population. We have studied rostafuroxin in three phase 2 clinical trials assessing reduction in blood pressure in a hypertensive population selected in accordance with a specified genetic profile. After positive phase 2a results, a phase 2b study was initiated. In this most recent phase 2b clinical trial, rostafuroxin demonstrated efficacy in Caucasian patients but not in Chinese patients. We are exploring potential reasons for the different responses.

Lyophilized KL4 Surfactant

Our KL4 surfactant can be lyophilized for reconstitution to a liquid just prior to administration. We plan to conduct studies to assess potential reduction of cold chain storage and refrigeration requirements of lyophilized KL4 surfactant in the hospital. We have demonstrated in laboratory experiments that our lyophilized KL4 surfactant retains many of the key attributes and characteristics of our liquid instillate. We are assessing potential development pathways to secure marketing approval for lyophilized KL4 surfactant as an intratracheal instillate for the treatment and/or prevention of RDS. Lyophilized KL4 surfactant is the drug product component of AEROSURF and a lyophilized dosage form of the liquid KL4 surfactant intratracheal instillate, or SURFAXIN®, which was approved by the FDA in 2012. In April 2015, we voluntarily ceased commercializing SURFAXIN to focus our resources on the development of aerosolized KL4 surfactant for respiratory diseases, beginning with AEROSURF. Going forward, if we are able to define an acceptable development program for lyophilized KL4 surfactant that is achievable from a cost, timing and resource perspective, we may seek approval to treat premature infants who, because they are unable to breathe on their own or other reason, are not candidates for AEROSURF.

Other Programs

We are pursuing a number of early exploratory research programs to identify potential product candidates, including oral (and intravenous) SERCA 2a heart failure compounds and other product candidates utilizing our KL4 surfactant and ADS technologies.

Recent Developments

On December 6, 2019, we completed a private placement in which we issued and sold an aggregate of 8,749,999 shares of common stock at a price per share of $3.02, and warrants to purchase up to an aggregate of 4,375,002 shares of common stock at an exercise price equal to $4.03 per share, for an aggregate purchase price of approximately $26.4 million, which we refer to as the December 2019 Private Placement. Included in the purchase price, LPH II Investments Limited, or LPH II, an affiliate of Lee's Pharmaceutical Holdings Ltd., converted $2.95 million of existing debt obligations on the same terms as the other investors.

Financial Update as of December 31, 2019

As of December 31, 2019 we estimate that cash and cash equivalents were approximately $22.5 million.

These estimates are preliminary and actual results may differ from these estimates due to the completion of our closing procedures with respect to the fiscal year ended December 31, 2019, the final adjustments and other developments that may arise between now and the time the financial results for the 2019 fiscal year are finalized. As such, these estimates should not be viewed as a substitute for our full audited financial statements prepared in accordance with U.S. generally accepted accounting principles. These expected results could change materially and are not necessarily indicative of the results to be achieved for our 2019 fiscal year or any future period. As a result, of the foregoing considerations and other limitations described herein, investors are cautioned not to place undue reliance on this preliminary financial information. We do not undertake any obligation to publicly update or revise this estimate, except as required by law.

Our Strategy

We intend to maximize the value of our product candidates and proprietary technologies. Our strategy to achieve this goal includes plans to:

- **Advance istaroxime for the treatment of AHF to a phase 3-ready position**. We plan to complete the istaroxime AHF phase 2b clinical program and develop a strong phase 3-ready position for continued development and potential partnering;

- **Study istaroxime for early cardiogenic shock, which if the drug demonstrates adequate potential to raise blood pressure with acceptable safety, may create the opportunity with a Breakthrough Therapy designation, an expedited development program.** In 2020, we plan to initiate a small phase 2a clinical trial in early cardiogenic shock to explore a potential expedited regulatory pathway for istaroxime in this area of unmet medical need;

- **Advance development of preclinical heart failure programs**. To create added value to the istaroxime programs, we plan to our advance oral/chronic and intravenous SERCA2a preclinical product candidates through proof of concept;

- **Advance AEROSURF to a phase 3-ready position**. In 2020, we plan to initiate a small phase 2 bridging study to clinically evaluate the performance of the new ADS in the NICU and introduce a potentially optimized dose regimen. We intend to advance AEROSURF to a phase 3-ready position by leveraging development opportunities in China (the largest RDS and surfactant market) with our licensee for Asia supporting clinical costs;

- **Seek strategic collaborative relationships for the development and potential commercialization of rostafuroxin**. We are exploring strategic collaborations to out-license and use proceeds to provide non-dilutive funding of our core programs;

- **List our common stock on The Nasdaq Capital Market®**. In 2020, we plan to obtain a listing on the Nasdaq Capital Market, or Nasdaq. We have applied to list our common stock although there can be no assurance that we will be successful in listing our common stock on Nasdaq; and

- **Execute business development and explore acquiring additional product candidates**. We plan to execute robust business development for partnerships for current development programs as well as explore acquiring additional product candidates to add to our development pipeline.

Risks Related to Our Business

Our ability to execute on our business strategy is subject to numerous risks, as more fully described in the section titled “Risk Factors” immediately following this Prospectus Summary. These risks include, among others:

- We have incurred significant operating losses since inception, we expect to incur operating losses in the future and we may not be able to achieve or sustain profitability;

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

- We will continue to require significant additional capital to support our research and development activities and operations;

- We are subject to regulatory approval processes that are lengthy, time consuming and unpredictable, and we may not obtain approval for our product candidates;
- Even though some of our product candidates have Fast Track designation, the FDA may not approve them at all or any sooner than other product candidates that do not have Fast Track designation;
- We depend on the performance of third parties, including third-party manufacturers;
- Our plan to use strategic alliances and collaboration arrangements to leverage partner capabilities may not be successful if we are unable to integrate their capabilities with our own or if our partners' capabilities do not meet our expectations;
- Our activities are subject to various and complex laws and government regulations, and we are susceptible to a changing regulatory environment;
- If we are unable to adequately protect our intellectual property rights, or if we are accused of infringing on the intellectual property rights of others, our competitive position could be harmed or we could be required to incur significant expenses to enforce or defend our rights;
- We may be unable to recruit or retain key employees, including our senior management team; and
- We have applied to list our common stock on Nasdaq. We can provide no assurance that our common stock will qualify to be listed, and if listed, that our common stock will continue to meet Nasdaq listing requirements. If we fail to comply with the continuing listing standards of Nasdaq, our securities could be delisted.

Corporate Information

We were incorporated in Delaware on November 6, 1992. Our principal executive offices are located at 2600 Kelly Road, Suite 100, Warrington, Pennsylvania, 18976, and our telephone number is 215-488-9300. Our website address is www.windtreetx.com. The information contained in, or accessible through, our website does not constitute part of this prospectus. We have included our website address as an inactive textual reference only.

This prospectus includes trademarks, tradenames and service marks that are the property of other organizations. Solely for convenience, trademarks and tradenames referred to in this prospectus appear without the ® and ™ symbols, but those references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or that the applicable owner will not assert its rights, to these trademarks and tradenames.

THE OFFERING

Common stock offered by the selling stockholders	A total of up to 13,221,430 shares of common stock, which consists of: (i) 8,846,428 common shares and (ii) 4,375,002 warrant shares. The selling stockholders may from time to time sell some, all or none of the shares of common stock pursuant to the registration statement of which this prospectus is a part.
Selling stockholders	See “Selling Stockholders” beginning on page 113
Common stock outstanding	41,091,532 shares
Use of proceeds	We will not receive any proceeds from the sale of shares of our common stock by the selling stockholders in this offering. See “Use of Proceeds.”
Risk factors	Investing in our common stock involves significant risks. See “Risk Factors” beginning on page 7 of this prospectus.
OTCQB marketplace symbol	WINT
Proposed Nasdaq Capital Market symbol	Our common stock is currently listed on OTCQB and we have applied to list our common stock on The Nasdaq Capital Market, or Nasdaq under the symbol “WINT”. While we believe that we will meet the standards for listing on Nasdaq, there can be no assurance that we will be successful in listing our common stock on Nasdaq.
Transfer agent and registrar	Continental Stock Transfer and Trust Company

Except as otherwise indicated, the number of shares of our common stock outstanding is based on 41,091,532 shares of our common stock outstanding as of December 31, 2019, and excludes:

- 5,316,831 shares of our common stock issuable upon the exercise of stock options outstanding as of December 31, 2019, at a weighted-average exercise price of $5.87 per share;
- 14,224,460 shares of our common stock issuable upon the exercise of the warrants outstanding as of December 31, 2019, at a weighted-average exercise price of $7.34 per share;
- 447,683 shares of our common stock available for future grant under our 2011 Long-Term Incentive Plan, as amended; and
- 105,000 shares of our common stock issuable upon the vesting of restricted stock units outstanding as of December 31, 2019.

Unless otherwise indicated, all information in this prospectus reflects or assumes no issuance or exercise of stock options or warrants on or after January 17, 2020.

RISK FACTORS

Investing in our common stock involves a high degree of risk. These risks include, but are not limited to, those described below, each of which may be relevant to an investment decision. You should carefully consider the risks described below, together with all of the other information in this prospectus, including our consolidated financial statements and related notes, before investing in our common stock. While we believe that the risks and uncertainties described below are the material risks facing our business, additional risks that we do not know of or that we currently think are immaterial may also arise and materially affect our business. The realization of any of these risks could have a material adverse effect on our business, financial condition, results of operations, and our ability to accomplish our strategic objectives. In that event, the trading price of our common stock could decline, and you may lose part or all of your investment.

Risk Related to Our Financial Condition

We have incurred significant operating losses since inception, we expect to incur operating losses in the future and we may not be able to achieve or sustain profitability.

We have incurred operating losses since our incorporation on November 6, 1992. For the years ended December 31, 2017 and 2018, we had operating losses of $22.5 million and $16.2 million, respectively and for the nine months ended September 30, 2018 and 2019, we had operating losses of $11.3 million and $20.3 million, respectively. As of September 30, 2019, we had an accumulated deficit of $677.8 million. To date, we have financed our operations primarily through private placements and public offerings of our common and preferred stock and borrowings from investors and financial institutions.

We expect to continue to incur significant research and clinical development, regulatory and other expenses as we continue to develop our product candidates, obtain regulatory clearances or approvals for our planned or future product candidates, conduct clinical trials on our existing and planned or future product candidates and manufacturing, marketing and selling any products for which we may obtain regulatory approval. As a result, we expect to continue to incur operating losses for the foreseeable future and may never achieve profitability. Even if we do achieve profitability, we may not be able to sustain or increase profitability on an ongoing basis. If we do not achieve or sustain profitability, it will be more difficult for us to finance our business and accomplish our strategic objectives, either of which would have a material adverse effect on our business, financial condition and results of operations and may cause the market price of our common stock to decline.

We will require substantial additional financing to achieve our goals, and a failure to obtain this necessary capital when needed on acceptable terms, or at all, could force us to delay, limit, reduce or terminate our product development programs, or other operations.

The development of biopharmaceutical product candidates is capital-intensive. We expect our expenses to increase in connection with our ongoing activities, particularly as we conduct our ongoing and planned clinical trials, continue research and development and initiate clinical trials of our other development programs and seek regulatory approval for our current product candidates and any future product candidates we may develop. In addition, as our product candidates progress through development and toward commercialization, we may need to make milestone payments to licensors and other third parties from whom we have in-licensed or acquired our product candidates. Furthermore, if and to the extent we seek to acquire or in-license additional product candidates in the future, we may be required to make significant upfront payments, milestone payments, and/or licensing payments. If we obtain regulatory approval for any of our product candidates, we also expect to incur significant commercialization expenses related to product manufacturing, marketing, sales and distribution. Because the outcome of any clinical trial or preclinical study is highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of our product candidates. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we could be forced to delay, reduce or eliminate our research and development programs or any future commercialization efforts.

We believe that our existing cash and cash equivalents, will enable us to fund our operations into the second quarter of 2021. We have based these estimates on assumptions that may prove to be wrong, and we could use our capital resources sooner than we currently expect. Our operating plans and other demands on our cash resources may change as a result of many factors currently unknown to us, and we may need to seek additional funds sooner than planned, through public or private equity or debt financings or other capital sources, including potentially collaborations, licenses and other similar arrangements. In addition, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. Attempting to secure additional financing may divert our management from our day-to-day activities, which may adversely affect our ability to develop our product candidates.

Our future capital requirements will depend on many factors, including:

- the type, number, scope, progress, expansions, results, costs and timing of, our clinical trials and preclinical studies of our product candidates which we are pursuing or may choose to pursue in the future;
- the costs and timing of manufacturing for our product candidates, including commercial manufacturing if any product candidate is approved;
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs of obtaining, maintaining and enforcing our patents and other intellectual property rights;
- the timing and amount of the milestone or other payments we must make to the licensors and other third parties from whom we have in-licensed or acquired our product candidates;
- the costs and timing of establishing or securing sales and marketing capabilities if any product candidate is approved;
- our ability to achieve sufficient market acceptance, coverage and adequate reimbursement from payors and adequate market share and revenue for any approved products;
- the terms and timing of establishing and maintaining collaborations, licenses and other similar arrangements; and
- costs associated with any products or technologies that we may in-license or acquire.

Conducting clinical trials and preclinical studies is a time consuming, expensive and uncertain process that takes years to complete, and we may never generate the necessary data or results required to obtain regulatory approval and achieve product sales. In addition, our product candidates, if approved, may not achieve commercial success.

Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Adequate additional financing may not be available to us on acceptable terms, or at all.

Raising additional capital may cause dilution to our stockholders, including purchasers of common stock in this offering, restrict our operations or require us to relinquish rights to our technologies or product candidates.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through equity offerings, debt financings or other capital sources, including potentially collaborations, licenses and other similar arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If we raise funds through future collaborations, licenses and other similar arrangements, we may have to relinquish valuable rights to our future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us and/or that may reduce the value of our common stock.

Our existing and future debt obligations could impair our liquidity and financial condition, and if we are unable to meet our debt obligations, including with respect to any collateral requirements, the lenders could foreclose on our assets or seek a judgment against us and execute against our assets.

As of December 31, 2019, we had approximately $4.5 million in loans payable under a credit facility with O-Bank Co., Ltd., or O-Bank, in Taiwan that we assumed in the CVie acquisition and which expired on September 11, 2019 and currently matures in March 2020, or the O-Bank Facility. We are currently in the process of extending the maturity date of the O-Bank Facility to at least June 2021, although there can be no guarantee we will be successful in obtaining an extension. Our borrowings under the O-Bank Facility are secured by a cash account provided by Lee's Pharmaceutical Holdings Limited, or Lee's, however, Lee's does not have a contractual obligation to us to maintain its guarantee.

Our debt obligations:

- could impair our liquidity;
- could make it more difficult for us to satisfy our other obligations;
- require us to dedicate cash flow to payments on our debt, which would reduce the availability of our cash flow to fund working capital, capital expenditures and other corporate requirements;
- impose restrictions on our ability to incur other indebtedness, grant liens on our assets, and could impede us from obtaining additional financing in the future for working capital, capital expenditures, acquisitions and general corporate purposes;
- impose restrictions on us with respect to our ability to license our products in the United States, or U.S., and other markets around the world;
- could adversely affect our ability to enter into strategic transactions, public or private equity offerings, and similar agreements, or require us to obtain the consent to enter into such transactions;
- make us more vulnerable in the event of a downturn in our business prospects and could limit our flexibility to plan for, or react to, changes in our licensing markets; and
- could place us at a competitive disadvantage when compared to our competitors.

Should we fail to pay our obligations, fail to comply with any covenants contained in any related agreements, including the collateral maintenance agreement under the O-Bank Facility, or if Lee's withdraws its pledge of collateral to secure the O-Bank Facility, we could be in default regarding that indebtedness and the lender could accelerate payment of the outstanding indebtedness. Moreover, in the future, to secure our obligations under any loans, we may be required to grant to the lender a security interest in some or substantially all of our assets.

In the past we have engaged in cash conservation activities and to the extent necessary, may continue to do so. Such cash conservation management may adversely affect our relationship with our vendors and service providers.

We have from time to time experienced periods in which our cash resources have been constrained. As such, it is our practice to routinely closely monitor and control our cash resources to assure that investment and spending decisions advance our corporate objectives at any time. To manage our cash, we tightly control purchasing and retention of consultants, closely monitor the release of funds and may defer payment on invoices to conserve cash. This practice of conserving cash may adversely impact our relationships with key vendors and service providers and the pace at which we are able to advance our programs. While we work closely with our vendors and service providers to preserve our key relationships, there can be no assurance that we will be successful and that our vendor and service providers will continue to work with us, particularly during a period of constrained cash resources. Failure to retain such key relationships could have a material adverse effect on our development activities and our business and operations.

We have a significant amount of intangible assets, including goodwill, recorded on our balance sheet which may lead to potentially significant impairment charges.

We review long-lived assets, including intangible assets and goodwill, for impairment whenever events or changes in estimates and circumstances indicate that the related carrying amounts may not be recoverable based on the existence of certain triggering events. Intangible assets and goodwill are also subject to an impairment assessment at least annually. The amount of identifiable intangible assets and goodwill in our consolidated balance sheet has increased significantly because of the acquisition of CVie Therapeutics Ltd., or CVie Therapeutics in December 2018. The identifiable intangible assets resulting from the CVie Therapeutics acquisition relate to in-process research and development of istaroxime and rostafuroxin. At September 30, 2019, intangible assets and goodwill recorded on our consolidated balance sheet was $77.1 million and $15.7 million, respectively.

If long-lived assets are determined to be impaired in the future, we would be required to record a potentially significant write-off, which would have an adverse effect on our results of operations and financial condition.

Risks Related to our Development and Regulatory Approval of our Product Candidates

Clinical development involves a lengthy and expensive process with an uncertain outcome, and results of preclinical studies and early clinical trials are not necessarily predictive of future results. In addition, our assumptions about why our product candidates are worthy of future development and potential approval are based on data primarily collected by other companies. Our product candidates may not have favorable results in later clinical trials, if any, or receive regulatory approval on a timely basis, if at all.

Clinical drug development is expensive and can take many years to complete, and its outcome is inherently uncertain. We cannot guarantee that any clinical trials will be conducted as planned or completed on schedule, if at all, and failure can occur at any time during the preclinical study or clinical trial process as a result of inadequate study design, inadequate performance of a drug, inadequate adherence by patients or investigators to clinical trial protocols, or other factors. Despite promising preclinical or clinical results, any product candidate can unexpectedly fail at any stage of preclinical or clinical development. The historical failure rate for product candidates in our industry is high.

New drugs in later stages of clinical trials may fail to show the desired safety and efficacy traits despite having progressed through earlier clinical trials. As a result, data we obtain from our phase 2 clinical trials may not accurately predict phase 3 trial results, whether due to differences in sample size, study arms, duration, endpoints, other factors, or, in the case of AEROSURF, features of the ADS used. If either or both istaroxime or AEROSURF should fail to perform as designed in their respective phase 3 clinical programs, such failures could adversely affect the results of our clinical development program despite promising results in earlier trials. If clinical trials for any of our product candidates fail to demonstrate safety or efficacy to the satisfaction of the FDA or the equivalent regulatory authorities in other countries, the FDA or the equivalent regulatory authorities in other countries will not approve that drug and we would not be able to commercialize it, which could have a material adverse effect on our business, financial condition, results of operations, and prospects. Moreover, if we are required to cease development activities on any of our recently acquired product candidates due to adverse clinical results or otherwise, it could result in impairment of related intangible assets and goodwill on our balance sheet.

Even if later stage clinical trials are successful, regulatory authorities may question the trial design or sufficiency for approval of the endpoints we select for our clinical trials or add new requirements, such as the completion of additional studies, as conditions for obtaining approval or obtaining an indication. For the foregoing reasons, we cannot be certain that our ongoing and planned clinical trials and preclinical studies will be successful. Any safety concerns observed in any one of our clinical trials in our targeted indications could limit the prospects for regulatory approval of our product candidates in those and other indications, which could have a material adverse effect on our business, financial condition and results of operations, and result in significant additional costs and expenses, require additional time and have an adverse effect on our business, including our financial condition and results of operations.

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

We may experience delays in clinical trials of our product candidates, or the time required to complete clinical trials for our product candidates may be longer than anticipated. Our planned clinical trials may not begin on time, have an effective design, enroll a sufficient number of patients, or be completed on schedule, if at all. Our clinical trials can be delayed for a variety of reasons, including, but not limited to:

- our inability to raise funding necessary to initiate or continue a trial;
- delays in obtaining regulatory approval to commence a trial or reaching a consensus with regulatory authorities on trial design;
- delays in reaching an agreement with the FDA or the equivalent foreign regulatory authorities in other countries on final trial design or the scope of the development program;
- inability to develop studies that are acceptable in all markets of interest;
- inability to come to an agreement on clinical trial design or execution factors with potential development partners;
- imposition of a clinical hold following an inspection of our clinical trial operations or trial sites by the FDA or the equivalent regulatory authorities in other countries;
- failures or delays in reaching agreement on acceptable terms with prospective CROs and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- delays in obtaining contracts with clinical sites and required IRB approval at each site;
- IRBs refusing to approve, suspending or terminating the trial at an investigational site, precluding enrollment of additional subjects, or withdrawing their approval of the trial;
- competition with other studies for study patients;
- changes to clinical trial protocol;
- delays in recruiting suitable patients to participate in a trial;
- subjects choosing an alternative treatment for the indication for which we are developing our product candidates, or participating in competing clinical trials;
- delays in having subjects complete participation in a trial or return for post-treatment follow-up;
- clinical sites deviating from trial protocol or dropping out of a trial to the detriment of enrollment;
- subjects experiencing severe or unexpected adverse events;
- occurrence of serious adverse events in trials of the same class of agents conducted by other companies;
- selection of clinical endpoints that require prolonged periods of clinical observation or analysis of the resulting data;
- third-party clinical investigators losing the licenses or permits necessary to perform our clinical trials, not performing our clinical trials on our anticipated schedule or consistent with the clinical trial protocol, good clinical practices, or GCP, or other regulatory requirements;
- third-party contractors not performing data collection or analysis in a timely or accurate manner;
- third-party contractors becoming debarred or suspended or otherwise penalized by the FDA or other government or regulatory authorities for violations of regulatory requirements, in which case we may need to find a substitute contractor, and we may not be able to use some or all of the data produced by such contractors in support of our marketing applications;
- manufacturing sufficient quantities of product candidate or obtaining sufficient quantities of combination therapies for use in clinical trials or changes in the manufacturing process that may be necessary or desired;
- time required to add new clinical sites; or
- delays by our contract manufacturers to produce and deliver a sufficient supply of clinical trial materials or being ordered by the FDA or comparable foreign regulatory authorities to temporarily or permanently shut down due to violations of cGMP regulations or other applicable requirements, or infections or cross-contaminations of product candidates in the manufacturing process.

We may not reach agreement with the FDA, or a foreign regulator on the extent of our phase 3 programs, the design of any one or more of the clinical trials necessary for approval, or we may be unable to reach agreement on a single design that would permit us to conduct a common pivotal phase 3 clinical development program in all markets of interest. For example, we may not be able to design a study that is acceptable to both the FDA and European Medicines Agency, or EMA, regulators, which would cause us to limit the scope of our geographical activities or greatly increase our investment. Even if we complete the clinical trial within our anticipated time, if our results are inconclusive or non-compelling or otherwise insufficient to support a strategic or financing transaction, we potentially could be forced to limit or cease our development activities, which would have a material adverse effect on our business.

Use of our product candidates could be associated with side effects, adverse events or other properties or safety risks, which could delay or preclude approval, cause us to suspend or discontinue clinical trials, abandon a product candidate, limit the commercial profile of an approved label or result in other significant negative consequences that could severely harm our business, prospects, operating results and financial condition.

As is the case with pharmaceuticals generally, there may be adverse events in patients treated with our product candidates. Results of our clinical trials could reveal a high and unacceptable severity and prevalence of side effects or unexpected characteristics. Undesirable side effects caused by our product candidates could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in a more restrictive label or the delay or denial of regulatory approval by the FDA or comparable foreign regulatory authorities. Adverse events could affect patient recruitment or the ability of enrolled patients to complete the trial or result in potential product liability claims. Any of these occurrences may harm our business, financial condition and prospects significantly.

Moreover, if our product candidates are associated with undesirable side effects in clinical trials or have characteristics that are unexpected, we may elect to abandon their development or limit their development to more narrow uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective, which may limit the commercial expectations for the product candidate if approved. We may also be required to modify our study plans based on findings in our ongoing clinical trials. Many compounds that initially showed promise in early-stage testing have later been found to cause side effects that prevented further development of the compound. In addition, regulatory authorities may draw different conclusions or require additional testing to confirm these determinations.

It is possible that as we test our product candidates in larger, longer and more extensive clinical trials, or as the use of these product candidates becomes more widespread if they receive regulatory approval, illnesses, injuries, discomforts and other adverse events that were observed in earlier trials, as well as conditions that did not occur or went undetected in previous trials, will be reported by subjects. If such side effects become known later in development or upon approval, if any, such findings may harm our business, financial condition and prospects significantly.

In addition, if one or more of our product candidates receives marketing approval, and we or others later identify undesirable side effects caused by such products, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw, suspend or limit approvals of such product;
- we may be required to recall a product or change the way such product is administered to patients;
- regulatory authorities may require additional warnings on the label, such as a “black box” warning or a contraindication;
- we may be required to implement a Risk Evaluation and Mitigation Strategy, or REMS, or create a medication guide outlining the risks of such side effects for distribution to patients;
- we may be required to change the way a product is distributed or administered, conduct additional clinical trials or change the labeling of a product or be required to conduct additional post-marketing studies or surveillance;
- we could be sued and held liable for harm caused to patients;
- sales of the product may decrease significantly, or the product could become less competitive; and
- our reputation may suffer.

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

Our product candidates are subject to extensive regulation and compliance, which is costly and time consuming, and such regulation may cause unanticipated delays or prevent the receipt of the required approvals to commercialize our product candidates.

The clinical development, manufacturing, labeling, storage, record-keeping, advertising, promotion, import, export, marketing and distribution of our product candidates are subject to extensive regulation by the FDA in the U.S. and by comparable foreign regulatory authorities in foreign markets. In the U.S., we are not permitted to market our product candidates until we receive regulatory approval from the FDA. The process of obtaining regulatory approval is expensive, often takes many years following the commencement of clinical trials and can vary substantially based upon the type, complexity and novelty of the product candidates involved, as well as the target indications and patient population. Approval policies or regulations may change, and the FDA has substantial discretion in the drug approval process, including the ability to delay, limit or deny approval of a product candidate for many reasons. Despite the time and expense invested in clinical development of product candidates, regulatory approval is never guaranteed. We are not permitted to market any of our product candidates in the U.S. until we receive approval of a New Drug Application, or NDA, from the FDA.

Prior to obtaining approval to commercialize a product candidate in the U.S. or abroad, we must demonstrate with substantial evidence from adequate and well-controlled clinical trials, and to the satisfaction of the FDA or comparable foreign regulatory authorities, that such product candidates are safe and effective for their intended uses. Results from nonclinical studies and clinical trials can be interpreted in different ways.

Even if we believe the nonclinical or clinical data for our product candidates are promising, such data may not be sufficient to support approval by the FDA and comparable foreign regulatory authorities. The FDA or comparable foreign regulatory authorities, as the case may be, may also require us to conduct additional preclinical studies or clinical trials for our product candidates either prior to or post-approval, or may object to elements of our clinical development program.

The FDA or comparable foreign regulatory authorities can delay, limit or deny approval of a product candidate for many reasons, including:

- such authorities may disagree with the design or implementation of our clinical trials;
- negative or ambiguous results from our clinical trials or results may not meet the level of statistical significance required by the FDA or comparable foreign regulatory agencies for approval;
- serious and unexpected adverse events may be experienced by participants in our clinical trials or by individuals using drugs similar to our product candidates;
- the population studied in the clinical trial may not be sufficiently broad or representative to assure safety in the full population for which we seek approval;
- such authorities may not accept clinical data from trials which are conducted at clinical facilities or in countries where the standard of care or patient characteristics are potentially different from that of the U.S.;
- we may be unable to demonstrate that a product candidate’s clinical and other benefits outweigh its safety risks or the safety data base may not be large enough;
- such authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- such authorities may not agree that the data collected from clinical trials of our product candidates are acceptable or sufficient to support;
- the submission of an NDA or other submission or to obtain regulatory approval in the U.S. or elsewhere, and such authorities may impose requirements for additional preclinical studies or clinical trials;

- such authorities may disagree regarding the formulation, labeling and/or the specifications of our product candidates;
- approval may be granted only for indications that are significantly more limited than what we apply for and/or with other significant restrictions on distribution and use;
- such authorities may find deficiencies in the manufacturing processes or facilities of our third-party manufacturers with which we contract for clinical and, if approved, commercial supplies; or the approval policies;
- regulations of such authorities may significantly change in a manner rendering our or any of our potential future collaborators' clinical data insufficient for approval; or
- such authorities may not accept a submission due to, among other reasons, the content or formatting of the submission.

We may conduct clinical development in the U.S., Canada, the European Union, or EU, Latin America, and Asia Pacific regions and sell our products in the U.S. and potentially in other major markets. To accomplish this objective, we must obtain and maintain regulatory approvals and comply with regulatory requirements in each jurisdiction. To avoid the significant expense and lengthy time required to complete multiple regional clinical development programs, we expect to meet with relevant regulatory authorities. While we would prefer to design a single, global clinical development program that would satisfy the regulators in all of our target markets, there can be no assurance that our efforts will be successful. If we are unable to reach agreement with the various regulatory authorities, we may not be able to pursue regulatory approval of our products in all of our selected markets.

With respect to foreign markets, approval procedures vary among countries and, in addition to the foregoing risks, may involve additional product testing, administrative review periods and agreements with pricing authorities. In addition, events raising questions about the safety of certain marketed pharmaceuticals may result in increased cautiousness by the FDA and comparable foreign regulatory authorities in reviewing new drugs based on safety, efficacy or other regulatory considerations and may result in significant delays in obtaining regulatory approvals. Any delay in obtaining, or inability to obtain, applicable regulatory approvals would prevent us or any of our potential future collaborators from commercializing our product candidates.

Of the large number of drugs in development, only a small percentage successfully complete the FDA or foreign regulatory approval processes and are commercialized. The lengthy approval process as well as the unpredictability of future clinical trial results may result in our failing to obtain regulatory approval to market our product candidates, which would significantly harm our business, financial condition, results of operations and prospects.

Because we have multiple product candidates in our clinical pipeline, we may expend our limited resources to pursue a particular product candidate and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we focus on specific product candidates, indications and development programs. We also plan to conduct several clinical trials for multiple product candidates in parallel over the next several years, which may make our decision as to which product candidates to focus on more difficult. As a result, we may forgo or delay pursuit of opportunities with other product candidates that could have had greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through future collaborations, licenses and other similar arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

Additionally, we may pursue additional in-licenses or acquisitions of development-stage assets or programs, which entails additional risk to us. Identifying, selecting and acquiring promising product candidates requires substantial technical, financial and human resources expertise. Efforts to do so may not result in the actual acquisition or license of a particular product candidate, potentially resulting in a diversion of our management's time and the expenditure of our resources with no resulting benefit. For example, if we are unable to identify programs that ultimately result in approved products, we may spend material amounts of our capital and other resources evaluating, acquiring and developing products that ultimately do not provide a return on our investment.

Even though some of our product candidates have Fast Track designation, the FDA may not approve them at all or any sooner than other product candidates that do not have Fast Track designation.

We have received Fast Track designation from the FDA for AEROSURF for the treatment of RDS in infants and for istaroxime for the treatment of AHF. Fast Track designation does not ensure that we will receive marketing approval or that approval will be granted within any particular timeframe. We may not experience a faster development, regulatory review or approval process with Fast Track designation compared to conventional FDA procedures. Additionally, the FDA may withdraw Fast Track designation, for reasons such as it comes to believe a drug candidate no longer adequately addresses an unmet medical need. Fast Track designation alone does not guarantee qualification for the FDA's priority review procedures. If we seek Fast Track designation for other product candidates, we may not receive such a designation from the FDA.

Although we may pursue expedited regulatory programs for a product candidate or an indication, it may not qualify for expedited development or, if it does qualify for expedited development, it may not actually lead to a faster development or regulatory review or approval process.

Although we have received Fast Track designation for certain of our product candidates, we believe there may be an opportunity to expedite the development of other product candidates or indications through one or more of the FDA's expedited programs, such as fast track, breakthrough therapy, or priority review, we cannot be assured that any of our product candidates or indications will qualify for such programs.

For example, a drug may be eligible for designation as a breakthrough therapy if the drug is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening condition and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints. Although breakthrough designation or access to any other expedited program may expedite the development or approval process, it does not change the standards for approval. If we apply for breakthrough therapy designation or any other expedited program for our product candidates, the FDA may determine that our proposed target indication or other aspects of our clinical development plans do not qualify for such expedited program. Even if we are successful in obtaining a breakthrough therapy designation or access to any other expedited program, we may not experience faster development timelines or achieve faster review or approval compared to conventional FDA procedures. Access to an expedited program may also be withdrawn by the FDA if it believes that the designation is no longer supported by data from our clinical development program. Additionally, qualification for any expedited program does not ensure that we will ultimately obtain regulatory approval for such product candidate.

We may not be able to obtain or maintain Orphan Drug exclusivity for our product candidates.

Regulatory authorities in some jurisdictions, including the U.S. and Europe, may designate drugs for relatively small patient populations as Orphan Drugs. In the U.S., Orphan Drug designation entitles a party to financial incentives such as tax advantages and user-fee waivers. In addition, if a product candidate that has Orphan Drug designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to Orphan Drug exclusivity, which means that the FDA may not approve any other applications, including an NDA, to market the same drug for the same indication for seven years, except in limited circumstances, including if the FDA concludes that the later drug is clinically superior to the approved drug. A drug is clinically superior if it is safer, more effective, or makes a major contribution to patient care. The FDA has granted Orphan Drug designation for our (i) KL4 surfactant (lucinactant) for the treatment of RDS in premature infants, (ii) our KL4 surfactant for the prevention and treatment of BPD in premature infants, (iii) our KL4 surfactant for the treatment of ARDS in adults, and (iv) our KL4 surfactant for the treatment of cystic fibrosis, or CF.

If we obtain Orphan Drug exclusivity, we may lose such exclusivity if the FDA or the European Commission, or EC, determines that the request for designation was materially defective or if we are unable to assure sufficient quantity of the drug to meet the needs of patients with the rare disease or condition. Moreover, Orphan Drug exclusivity may not effectively protect our product candidates from competition because different drugs can be approved for the same condition. Even after an Orphan Drug is approved, the FDA or comparable foreign regulatory authority can subsequently approve the same drug for the same condition if such regulatory authority concludes that the later drug is clinically superior if it is shown to be safer, more effective or makes a major contribution to patient care. Orphan drug designation neither shortens the development time or regulatory review time of a drug nor gives the drug any advantage in the regulatory review or approval process.

Interim, topline and preliminary data from our clinical trials that we announce or publish from time to time may change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final data.

From time to time, we may publicly disclose preliminary or topline or data from our clinical studies, which is based on a preliminary analysis of then-available data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial. We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the topline results that we report may differ from future results of the same studies, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Topline data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data we previously published. As a result, topline data should be viewed with caution until the final data are available. From time to time, we may also disclose interim data from our clinical studies. Interim data from clinical trials that we may complete are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues and more patient data become available. Adverse differences between preliminary or interim data and final data could significantly harm our business prospects.

Even if we receive regulatory approval for any product candidates, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense. Additionally, our product candidates, if approved, could be subject to labeling and other restrictions on marketing or withdrawal from the market, and we may be subject to penalties if we fail to comply with regulatory requirements or if we experience unanticipated problems with our product candidates, when and if any of them are approved.

Following potential approval of any our product candidates, the FDA may impose significant restrictions on a product's indicated uses or other aspects of the directions for use or marketing or impose ongoing requirements for potentially costly and time consuming post-approval studies, post-market surveillance or clinical trials to monitor the safety and efficacy of the product. The FDA may also require a REMS as a condition of approval of our product candidates, which could include requirements for a medication guide, physician communication plans or additional elements to ensure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. In addition, if the FDA or a comparable foreign regulatory authority approves our product candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion, import, export and recordkeeping for our products will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with cGMPs and GCP requirements for any clinical trials that we conduct post-approval. Later discovery of previously unknown problems with our products, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing or manufacturing of our products, withdrawal of the product from the market or voluntary or mandatory product recalls;
- restrictions on product distribution or use, or requirements to conduct post-marketing studies or clinical trials;
- fines, restitutions, disgorgement of profits or revenues, warning letters, untitled letters or holds on clinical trials;

- refusal by the FDA to approve pending applications or supplements to approved applications filed by us or suspension or revocation of approvals;
- product seizure or detention, or refusal to permit the import or export of our products; and
- injunctions or the imposition of civil or criminal penalties.

The occurrence of any event or penalty described above may inhibit our ability to commercialize our product candidates and generate revenue and could require us to expend significant time and resources in response and could generate negative publicity.

In addition, if any of our product candidates is approved, our product labeling, advertising and promotion will be subject to regulatory requirements and continuing regulatory review. The FDA strictly regulates the promotional claims that may be made about drug products. In particular, a product may not be promoted for uses that are not approved by the FDA as reflected in the product's approved labeling. If we receive marketing approval for a product candidate, physicians may nevertheless prescribe it to their patients in a manner that is inconsistent with the approved label. If we are found to have promoted such off-label uses, we may become subject to significant liability. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant sanctions. The federal government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The FDA has also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed.

The FDA's and other regulatory authorities' policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained and we may not achieve or sustain profitability.

We are currently conducting, and may in the future conduct, certain of our clinical trials for our product candidates at clinical sites located in the U.S. and outside of the U.S. If the FDA and other foreign equivalents raise concerns about certain of the clinical sites based on location and regulatory environment, they may not accept data from such trials, in which case our development plans will be delayed, which could materially harm our business.

We are currently conducting, and may in the future conduct one or more of our clinical trials for our product candidates at clinical sites located in the U.S. and outside of the U.S. Although the FDA may accept data from clinical trials conducted outside the U.S., acceptance of this data may be subject to certain conditions imposed by the FDA. For example, the FDA requires the clinical trial to have been conducted in accordance with GCPs, and the FDA must be able to validate the data from the clinical trial through an onsite inspection if it deems such inspection necessary. There can be no assurance the FDA will accept data from clinical trials conducted outside of the U.S. If the FDA does not accept data from our clinical trials of our product candidates, it would likely result in the need for additional clinical trials, which would be costly and time consuming and delay or permanently halt our development of our product candidates.

If we fail to obtain and maintain regulatory approval in foreign jurisdictions, our market opportunities will be limited.

In order to market our product candidates in the EU or other foreign jurisdictions, we must obtain and maintain separate regulatory approvals and comply with numerous and varying regulatory requirements. The approval procedure varies from country to country and can involve additional testing. The time required to obtain approval abroad may be longer than the time required to obtain FDA clearance or approval. Foreign regulatory approval processes include many of the risks associated with obtaining FDA clearance or approval and we may not obtain foreign regulatory approvals on a timely basis, if at all. FDA clearance or approval does not ensure approval by regulatory authorities in other countries, and approval by one foreign regulatory authority does not ensure approval by regulatory authorities in other foreign countries. However, the failure to obtain clearance or approval in one jurisdiction may have a negative impact on our ability to obtain clearance or approval elsewhere. If we do not obtain or maintain necessary approvals to commercialize our products in markets outside the U.S., it would negatively affect our overall market penetration.

If the FDA or other applicable regulatory authorities approve generic products with claims that compete with our product candidates, it could reduce our sales of our product candidates if approved.

In the U.S., after an NDA is approved, the product covered thereby becomes a "listed drug" which can, in turn, be cited by potential competitors in support of approval of an abbreviated NDA, or ANDA. The Federal Food, Drug, and Cosmetic Act, or the FD&C Act, FDA regulations and other applicable regulations and policies provide incentives to manufacturers to create modified, non-infringing versions of a drug to facilitate the approval of an ANDA or other application for generic substitutes. These manufacturers might only be required to conduct a relatively inexpensive study to show that their product has the same active ingredients, dosage form, strength, route of administration, and conditions of use, or product labeling, as our product candidates and that the generic product is absorbed in the body at the same rate and to the same extent as, or is bioequivalent to, our product candidates. These generic equivalents would be significantly less costly than ours to bring to market and companies that produce generic equivalents are generally able to offer their products at lower prices. Thus, after the introduction of a generic competitor, a significant percentage of the sales of any branded product are typically lost to the generic product. Accordingly, competition from generic equivalents to our product candidates would substantially limit our ability to generate revenues and therefore to obtain a return on the investments we have made in our product candidates.

Even if we receive regulatory approval for any of our product candidates, we may not be able to successfully commercialize the product and the revenue that we generate from its sales, if any, may be limited.

If approved for marketing, the commercial success of our product candidates will depend upon each product’s acceptance by the medical community, including physicians, patients and health care payors. The degree of market acceptance for any of our product candidates will depend on a number of factors, including:

- demonstration of clinical safety and efficacy;
- relative convenience, dosing burden and ease of administration;
- the prevalence and severity of any adverse effects;
- the willingness of physicians to prescribe our product candidates, and the target patient population to try new therapies;
- efficacy of our product candidates compared to competing products;
- our ability to obtain and maintain sufficient third-party coverage or reimbursement from government health care programs, including Medicare and Medicaid, global government payors, private health insurers and other third-party payors or to receive the necessary pricing approvals from government bodies regulating the pricing and usage of therapeutics;
- the willingness of patients to pay out-of-pocket in the absence of third-party coverage or reimbursement or government pricing approvals;
- government health care payor imposed mandatory pricing discounting and reductions;
- delays in achieving hospital formulary acceptance or limitations of use that are more narrow than the approved label;
- the introduction of any new products that may in the future become available targeting indications for which our product candidates may be approved;
- new procedures or therapies that may reduce the incidences of any of the indications in which our product candidates may show utility;
- pricing and cost-effectiveness;
- the inclusion or omission of our product candidates in applicable therapeutic guidelines;
- the effectiveness of our own or any future collaborators’ sales and marketing strategies; and
- limitations or warnings contained in approved labeling from regulatory authorities.

If any of our product candidates are approved, but do not achieve an adequate level of acceptance by physicians, health care payors, and patients, we may not generate sufficient revenue and we may not be able to achieve or sustain profitability. Our efforts to educate the medical community and third-party payors on the benefits of our product candidates may require significant resources and may never be successful.

In addition, even if we obtain regulatory approvals, the timing or scope of any approvals may prohibit or reduce our ability to commercialize our product candidates successfully. For example, if the approval process takes too long, we may miss market opportunities and give other companies the ability to develop competing products or establish market dominance. Any regulatory approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render our product candidates not commercially viable. For example, regulatory authorities may approve any of our product candidates for fewer or more limited indications than we request, may grant approval contingent on the performance of costly post-marketing clinical trials, or may approve any of our product candidates with a label that does not include the labeling claims necessary or desirable for the successful commercialization for that indication. Further, the FDA or comparable foreign regulatory authorities may place conditions on approvals or require risk management plans or a REMS to assure the safe use of the drug. If the FDA concludes a REMS is needed, the sponsor of the NDA must submit a proposed REMS and, if a REMS is required, the FDA will not approve the NDA without an approved REMS. A REMS could include medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. The FDA may also require a REMS for an approved product when new safety information emerges. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of our product candidates. Moreover, product approvals may be withdrawn for non-compliance with regulatory standards or if problems occur following the initial marketing of the product. Any of the foregoing scenarios could materially harm the commercial success of our product candidates.

We currently have no sales and marketing organization. If we are unable to establish satisfactory sales and marketing capabilities or secure a sales and marketing partner, we may not successfully commercialize any of our product candidates.

We may not be able to enter into collaboration agreements on terms acceptable to us or at all. In addition, even if we enter into such relationships, we may have limited or no control over the sales, marketing and distribution activities of these third parties. Our future revenues may depend heavily on the success of the efforts of these third parties. If we elect to establish a sales and marketing infrastructure, we may not realize a positive return on this investment. In addition, we will have to compete with established and well-funded pharmaceutical and biotechnology companies to recruit, hire, train and retain sales and marketing personnel. Factors that may inhibit our efforts to commercialize our product candidates without strategic partners or licensees include:

- the inability of sales personnel to obtain access to or educate and appropriately persuade adequate numbers of physicians to prescribe any of our product candidates;
- inability to obtain a competitive share of voice and frequency of meeting with physicians against multiple, larger competitiors;
- unforeseen costs and expenses associated with creating an independent sales and marketing organization; and
- inability to control or influence partner sales and marketing personnel or their prioritization of promotion of our products.

Failure of our new ADS for use in our phase 3 program to perform as intended for our AEROSURF phase 2 bridge and phase 3 development activities and, if approved, initial commercial activities, would have a material adverse effect on our efforts to develop AEROSURF as well as our other aerosolized KL4 surfactant products, and our business strategy.

Our development activities are subject to certain risks and uncertainties, including, without limitation:

- the new ADS for use in our phase 2 bridge study that is intended for use in our remaining AEROSURF development activities including our planned phase 3 program, may not achieve acceptable levels of efficiency, consistent performance, reliability and may not be cost appropriate for commercial activities;

- we will require access to sophisticated engineering capabilities. We have our own medical device engineering staff and we have worked with Battelle Memorial Institute, or Battelle, on certain development initiatives. We currently are working with Mack Molding Company, or Mack, to complete a technology transfer of our device manufacturing process and expect to manufacture with Mack a sufficient number of ADS to support our remaining development activities. If we are unable to identify design engineers and medical device experts to support our continued development efforts in the future, including, potentially, for commercial use and later versions of the new ADS for use in our phase 3 program, it would have a material adverse effect on our business strategy and impair our ability to commercialize or develop AEROSURF or other aerosolized KL4 surfactant products; if we are unable to secure the necessary medical device development expertise to support our development program, this could impair our ability to commercialize or develop AEROSURF or other aerosolized KL4 surfactant products;

- the ADS may perform to specifications in the bench setting and internal tests, however, at clinical sites in our phase 2 bridge study or the phase 3 program with multiple operators of the device, we may experience an unanticipated issue with performance that could have a negative effect on trial outcomes; and

- even if the ADS performs adequately in the bridging study, additional development to the ADS platform may be required before phase 3 and commercialization.

The realization of any of the foregoing risks would have a material adverse effect on our AEROSURF development programs and our business.

The successful commercialization of our product candidates, if approved, will depend in part on the extent to which governmental authorities and health insurers establish coverage, adequate reimbursement levels and favorable pricing policies. Failure to obtain or maintain coverage and adequate reimbursement for our products could limit our ability to market those products and decrease our ability to generate revenue.

The availability of coverage and the adequacy of reimbursement by governmental healthcare programs such as Medicare and Medicaid, private health insurers and other third-party payors are essential for most patients to be able to afford prescription medications such as our product candidates, if approved. Our ability to achieve coverage and acceptable levels of reimbursement for our products by third-party payors will have an effect on our ability to successfully commercialize those products. Even if we obtain coverage for a given product by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. We cannot be sure that coverage and reimbursement in the U.S., the EU or elsewhere will be available for any product that we may develop, and any reimbursement that may become available may be decreased or eliminated in the future.

Third-party payors increasingly are challenging prices charged for pharmaceutical products and services, and many third-party payors may refuse to provide coverage and reimbursement for particular drugs when an equivalent generic drug or a less expensive therapy is available. It is possible that a third-party payor may consider our products as substitutable and only offer to reimburse patients for the less expensive product. Even if we are successful in demonstrating improved efficacy or improved convenience of administration with our products, pricing of existing drugs may limit the amount we will be able to charge for our products. These payors may deny or revoke the reimbursement status of a given product or establish prices for new or existing marketed products at levels that are too low to enable us to realize an appropriate return on our investment in product development. If reimbursement is not available or is available only at limited levels, we may not be able to successfully commercialize our products and may not be able to obtain a satisfactory financial return on products that we may develop.

There is significant uncertainty related to third-party payor coverage and reimbursement of newly approved products. In the U.S., third-party payors, including private and governmental payors, such as the Medicare and Medicaid programs, play an important role in determining the extent to which new drugs will be covered. Some third-party payors may require pre-approval of coverage for new or innovative devices or drug therapies before they will reimburse healthcare providers who use such therapies. It is difficult to predict at this time what third-party payors will decide with respect to the coverage and reimbursement for our products.

Obtaining and maintaining reimbursement status is time consuming, costly and uncertain. The Medicare and Medicaid programs increasingly are used as models for how private payors and other governmental payors develop their coverage and reimbursement policies for drugs. However, no uniform policy for coverage and reimbursement for products exists among third-party payors in the U.S. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. As a result, the coverage determination process is often a time consuming and costly process that will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. Furthermore, rules and regulations regarding reimbursement change frequently, in some cases at short notice, and we believe that changes in these rules and regulations are likely.

Outside the U.S., international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in Europe and other countries has and will continue to put pressure on the pricing and usage of our products. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems. Additional foreign price controls, discounts or other changes in pricing regulation could restrict the amount that we are able to charge for our products. Accordingly, in markets outside the U.S., the reimbursement for our products may be reduced and experience continual mandatory price reductions compared with the U.S. and may be insufficient to generate commercially reasonable revenue and profits.

Moreover, increasing efforts by governmental and third-party payors in the U.S. and abroad to cap or reduce healthcare costs may cause such organizations to limit both coverage and the level of reimbursement for newly approved products and, as a result, they may not cover or provide adequate payment for our products. We expect to experience pricing pressures in connection with the sale of any of our products due to the trend toward managed healthcare, the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and surgical procedures and other treatments, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products.

Risks Related to Our Reliance on Third Parties

We rely on third parties to conduct many of our preclinical studies and clinical trials. Any failure by a third party to conduct the clinical trials according to GCPs and other requirements and in a timely manner may delay or prevent our ability to seek or obtain regulatory approval for or commercialize our product candidates.

We are dependent on third parties to conduct our clinical trials and preclinical studies and preclinical studies for our other development programs. Specifically, we have used and relied on, and intend to continue to use and rely on, medical institutions, clinical investigators, CROs and consultants to conduct our clinical trials in accordance with our clinical protocols and regulatory requirements. These CROs, investigators and other third parties play a significant role in the conduct and timing of these trials and subsequent collection and analysis of data. While we have agreements governing the activities of our third-party contractors, we have limited influence over their actual performance. Nevertheless, we are responsible for ensuring that each of our clinical trials is conducted in accordance with the applicable protocol and legal, regulatory and scientific standards, and our reliance on the CROs and other third parties does not relieve us of our regulatory responsibilities. We and any third-party that we rely upon are required to comply with GCP requirements, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for all of our product candidates in clinical development. Regulatory authorities enforce these GCPs through periodic inspections of trial sponsors, principal investigators and trial sites. If we or any third-party that we rely on or trial sites fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable, and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. In addition, our clinical trials must be conducted with product produced under cGMP and/or Quality System Regulation, or QSR requirements. Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process.

There is no guarantee that any such CROs, investigators or other third parties will devote adequate time and resources to such trials or perform as contractually required. If any of these third parties fail to meet expected deadlines, adhere to our clinical protocols or meet regulatory requirements, or otherwise performs in a substandard manner, our clinical trials may be extended, delayed or terminated. In addition, many of the third parties with whom we contract may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials or other drug development activities that could harm our competitive position. In addition, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and may receive cash or equity compensation in connection with such services. If these relationships and any related compensation result in perceived or actual conflicts of interest, or the FDA concludes that the financial relationship may have affected the interpretation of the study, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized, which could result in the delay or rejection of any NDA we submit by the FDA. Any such delay or rejection could prevent us from commercializing our product candidates.

If any of our relationships with these third parties terminate, we may not be able to enter into arrangements with alternative third parties or do so on commercially reasonable terms. Switching or adding additional CROs, investigators and other third parties involves additional cost and requires management time and focus. In addition, there is a natural transition period when a new CRO commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines. Though we carefully manage our relationships with our CROs, investigators and other third parties, there can be no assurance that we will not encounter challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects.

We currently do not have back-up facilities for our contract manufacturing organizations, or CMOs, our suppliers of active pharmaceutical ingredients, or APIs, , our third-party analytical testing and other materials. If the parties we depend on for supplying our APIs and materials, as well as analytical testing and manufacturing-related services do not supply these products and services in a timely manner, it may delay or impair our ability to execute our development plans for our current and potential pipeline products. Such delays could adversely impact our operations and financial condition.

In most cases, we are dependent upon a single supplier to provide all of our requirements for our APIs and materials or one or more of our drug product subcomponents, components and subassemblies, analytical testing and manufacturing-related services. While we are working on second source manufacturing, we rely on single CMOs to manufacture drug product that meets appropriate content, quality and stability standards for use in preclinical programs and clinical trials. If we do not maintain these manufacturing and service relationships that are important to us and are not able to identify replacement suppliers, vendors and laboratories, or develop our own manufacturing capabilities, our ability to obtain regulatory approval for our products could be impaired or delayed and our costs could substantially increase. For example, we are currently discussing the wind down of our AEROSURF drug product manufacturing agreement and we are seeking to develop a new process for the manufacture of our API KL4. These CMOs have indicated a willingness to continue manufacturing on an interim basis to build drug product and API inventory to support our planned development efforts, but there can be no guarantee that they will remain willing or able to do so and thus are working with others as a replacement CMO.

We may be unable to identify additional manufacturers with whom we might establish appropriate arrangements on acceptable terms, if at all, because the number of potential CMOs is limited. Even if we are able to find replacement manufacturers, suppliers, vendors and service providers when needed, we may not be able to enter into agreements with them on terms and conditions favorable to us or there could be a substantial delay before such manufacturer, vendor or supplier, or a related new facility is properly qualified and registered with the FDA or other foreign regulatory authorities. A new manufacturer would have to be educated in, or develop substantially equivalent processes for, production of our approved products after receipt of FDA approval. To qualify and receive regulatory approval for a new manufacturer could take as long as two years. The process of changing a supplier could have an adverse impact on our current clinical development programs if supplies of drug substances, materials on hand are insufficient to satisfy demand. Such delays could have a material adverse effect on our development activities and our business.

We plan to rely on third parties to manufacture our drug products and manufacture and assemble our medical devices, which exposes us to risks that may affect our ability to maintain supplies of our clinical materials and could potentially delay our research and development activities, as well as eventual regulatory approval and commercialization of our drug product candidates.

Our manufacturing strategy includes manufacturing our drug products and our Aerosol Delivery System, or ADS, using third-party CMOs.

We do not own or operate manufacturing facilities and have no plans to build our own clinical or commercial scale manufacturing capabilities. We rely, and expect to continue to rely, on third parties for the manufacture of our product candidates and related raw materials for clinical and preclinical development, as well as for commercial manufacture if any of our product candidates receive marketing approval. The facilities used by third-party manufacturers to manufacture our product candidates must be approved by the FDA pursuant to inspections that will be conducted after we submit an NDA to the FDA. We do not control the manufacturing process of, and are completely dependent on, third-party manufacturers for compliance with cGMP requirements for manufacture of drug products and QSR requirements for the manufacture of medical devices and other government regulations and corresponding international standards. If these third-party manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or others, including requirements related to the manufacturing of high potency compounds, they will not be able to secure and/or maintain regulatory approval for their manufacturing facilities. In addition, we have no control over the ability of third-party manufacturers to maintain adequate quality control, quality assurance and qualified personnel and the third-party manufacturers may fail to manufacture our product according to our schedule or at all. If the FDA or a comparable foreign regulatory authority does not approve these facilities for the manufacture of our product candidates or if it withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our product candidates, if approved. Our failure, or the failure of our third-party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, seizures or recalls of product candidates or products, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of our products. In addition, any performance failure on the part of our existing or future manufacturers could delay clinical development or marketing approval, and any related remedial measures may be costly or time consuming to implement. We do not currently have arrangements in place for redundant supply or a second source for all required raw materials used in the manufacture of our product candidates. If our current third-party manufacturers cannot perform as agreed, we may be required to replace such manufacturers and we may be unable to replace them on a timely basis or at all.

Our or a third party's failure to execute on our manufacturing requirements, technology transfers of our manufacturing and our planned future reliance on CMOs exposes us, among other things, to the following risks:

- an inability to initiate or continue clinical trials of istaroxime or AEROSURF or any future product candidates under development;
- subjecting third-party manufacturing facilities or our manufacturing facilities to additional inspections by regulatory authorities;
- we may implement a plan to execute a technology transfer of our manufacturing process to a CMO and, after investing significant time and resources, learn that the CMO we chose is unable to successfully complete the technology transfer and thereafter manufacture our products in accordance with our plan;
- CMOs might be unable to manufacture our products in the volume and to our specifications to meet our clinical and commercial needs, or we may have difficulty scheduling the production of drug product and devices in a timely manner to meet our timing requirements;

- if we desire to make our drug products and/or devices available outside the U.S. for clinical or commercial purposes, our CMOs would become subject to, and may not be able to comply with, corresponding manufacturing and quality system regulations or standards of the various foreign regulators having jurisdiction over our activities abroad. Such failures (such as in-country quality testing) could result in not only a loss of approved supply to that country, but a total loss of a lot (or lots) of materials globally and could restrict our ability to execute our business strategies;

- we may have difficulty implementing changes or necessary modifications to our manufacturing processes that may be required by the FDA or foreign regulator or our CMO, if, for example, such changes would burden our CMO or otherwise disrupt operations, or our CMO could impose significant financial terms to implement any such change that could adversely affect our business. We may fail to adequately develop new manufacturing processes. Failure to achieve such required changes or modifications could delay or prevent our gaining regulatory approval for our product candidates or prevent us from continuing to market our approved products, which would have a material adverse effect on our business, financial condition and operations;

- we may fail to adequately scale manufacturing to achieve our objectives for cost of goods and profit margins;

- we may be subject to disputes arising with respect to the ownership of rights to any technology developed with third-parties; and

- we may be subject to the misappropriation of our proprietary information, including our trade secrets and know-how.

Each of the foregoing risks and others could delay our development programs and, if approved, commercial manufacturing plans, limit our ability to maintain continuity of supply for our approved products, delay or impair the approval, if any, of our product candidates by the FDA, or result in higher costs or deprive us of potential product revenues.

In addition, our product candidates and any products that we may develop may compete with other product candidates and products for access to manufacturing facilities. There are a limited number of manufacturers that operate under cGMP regulations and that might be capable of manufacturing for us.

Our current and anticipated future dependence upon others for the manufacture of our product candidates or products may adversely affect our future profit margin and our ability to commercialize any products that receive marketing approval on a timely and competitive basis.

Our ability to manufacture our product candidates depends upon receiving adequate supplies and related services, which may be difficult or uneconomical to procure.

Supply chain or manufacturing interruptions could negatively impact our operations and financial performance. In connection with our drug product manufacturing activities, we own certain specialized manufacturing equipment installed at our CMO. However, we do not have fully-redundant systems and equipment to respond promptly in the event of a significant loss at a CMO's manufacturing operations. Under certain conditions, we may be unable to produce our drug product and medical devices at the required volumes or to appropriate standards, if at all. The supply of any of our manufacturing materials may be interrupted because of supply shortages, poor vendor performance or other events outside our control, which may require us, among other things, to identify alternate vendors, which could involve a lengthy process, and result in increased expenses.

Risks Related to our Business and Operations

Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations or any guidance we may provide.

Our quarterly and annual operating results may fluctuate significantly, which makes it difficult for us to predict our future operating results.

These fluctuations may occur due to a variety of factors, many of which are outside of our control, including, but not limited to:

- the timing and cost of, and level of investment in, research, development, regulatory approval and commercialization activities relating to our product candidates, which may change from time to time;

- the timing and success or failure of preclinical studies or clinical trials for our product candidates or competing product candidates, or any other change in the competitive landscape of our industry, including consolidation among our competitors or partners;
- the level of investment funding we are able to achieve and apply to our development operations;
- future changes or changes in requirements to achieve regulatory approval;
- coverage and reimbursement policies with respect to our product candidates, if approved, and potential future drugs that compete with our products;
- the cost of manufacturing our product candidates, which may vary depending on the quantity of production and the terms of our agreements with third-party manufacturers;
- the timing and amount of the milestone or other payments we must make to the licensors and other third parties from whom we have in-licensed our acquired our product candidates;
- expenditures that we may incur to acquire, develop or commercialize additional product candidates and technologies;
- our allocation of resources and ability to raise additional capital;
- the level of demand for any approved products, which may vary significantly; and
- future accounting pronouncements or changes in our accounting policies.

The cumulative effects of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance.

This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated revenue or earnings guidance we may provide.

Our industry is highly competitive, and we have less capital and resources than many of our competitors, which may give them an advantage in developing and marketing products similar to ours or make our products obsolete.

Our industry is highly competitive and subject to rapid technological innovation and evolving industry standards. We compete with numerous existing companies in many ways. We need to successfully introduce new products to achieve our strategic business objectives. If we cannot successfully introduce new products, adapt to changing technologies or anticipate changes in our current and potential customers' requirements, our products may become obsolete and our business could suffer.

Many of our competitors' companies have substantially greater research and development, manufacturing, marketing, financial, and technology personnel and managerial resources than we have. In addition, many of these competitors, either alone or with their collaborative partners, have significantly greater experience than we do in developing products, preclinical testing and human clinical trials management, obtaining FDA approval and other regulatory approvals, and manufacturing and marketing products. Accordingly, our competitors may succeed in receiving FDA or foreign regulatory approval or commercializing products and obtaining patent protection before us. Our competitors may successfully secure regulatory exclusivities in various markets, which could have the effect of barring us or limiting our ability to market our products in such markets. In addition, developments by our competitors may render our drug product candidates obsolete or noncompetitive.

We also face, and will continue to face, competition from colleges, universities, governmental agencies and other public and private research organizations. These competitive forces frequently and aggressively seek patent protection and licensing arrangements to collect royalties for technologies that they develop. Some of these technologies may compete directly with the technologies that we are developing. These institutions will also compete with us in recruiting highly qualified scientific personnel.

The political and healthcare policy environment is becoming more challenging for pharmaceutical companies and medical device manufacturers and may adversely affect our business.

Political, economic and regulatory influences globally are subjecting the healthcare industry to potential fundamental challenges that could substantially affect our business and results of operations. Government and private sector initiatives to limit the growth of healthcare costs, including price regulation, competitive pricing, coverage and payment policies, comparative effectiveness of therapies, technology assessments and managed-care arrangements, are continuing to arise in many countries where we potentially may seek to do business, including the U.S. There is increasing pressure on pricing, reimbursement and demands for value-based data to gain access to patients and healthcare funds globally. This may increase the costs of development, risks of commercialization and overall value of the opportunity.

Given the increasing uncertainty in the healthcare and pharmaceutical industries as well as increased regulatory scrutiny on foreign investment, capital investment in our industry and our ability to attract capital investment is becoming more challenging. This trend, if continued, may restrict or impair our ability to gain necessary funding for continued development and, if approved, commercialization of our products.

We also cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative or executive action, either in the U.S. or abroad. For example, certain policies of the current administration may impact our business and industry. The current administration has taken several executive actions, including the issuance of a number of Executive Orders, that could impose significant burdens on, or otherwise materially delay, the FDA's ability to engage in routine regulatory and oversight activities such as implementing statutes through rulemaking, issuance of guidance, and review and approval of marketing applications. It is difficult to predict how these executive actions, including the Executive Orders, will be implemented, and the extent to which they will affect the FDA's ability to exercise its regulatory authority. If these executive actions impose constraints on the FDA's ability to engage in oversight and implementation activities in the normal course, our business may be negatively impacted.

We depend upon key employees and consultants in a competitive market for skilled personnel. If we or our strategic partners or collaborators are unable to attract and retain key personnel, it could adversely affect our ability to develop and market our products.

We have assembled a team of qualified personnel to advance the development programs for our product candidates. We have competed and will continue to compete for qualified individuals with numerous biopharmaceutical companies, universities and other research institutions. Competition for such individuals is significant and attracting and retaining qualified personnel will be critical to our success, and any failure to do so successfully may have a material adverse effect on us.

We are highly dependent upon the members of our executive management team and our directors, as well as our consultants and collaborating scientists. Many of these individuals have been involved with us for many years, have played integral roles in our progress and we believe that they continue to provide value to us. A loss of any of our key personnel may have a material adverse effect on aspects of our business and clinical development and regulatory programs. The loss of services from any of our executives could significantly adversely affect our ability to develop and market our products and obtain necessary regulatory approvals. Further, we do not maintain key man life insurance.

Our future success also will depend on the continued service of our key professional, scientific and management personnel and our ability to recruit and retain additional personnel. While we attempt to provide competitive compensation packages to attract and retain key personnel at all levels in our organization, many of our competitors have greater resources and more experience than we do, making it difficult for us to compete successfully for key personnel. We may experience intense competition for qualified personnel and the existence of non-competition agreements between prospective employees and their former employers may prevent us from hiring those individuals or subject us to lawsuits brought by their former employers.

If our business development activities are unsuccessful, our business could suffer, and our financial performance could be adversely affected.

As part of our long-term growth strategy, we engage in business development activities intended to identify strategic opportunities, including potential strategic alliances, joint development opportunities, acquisitions, technology licensing arrangements and other similar opportunities. Such opportunities may result in substantial investments in our business. Our success in developing products or expanding into new markets from such activities will depend on a number of factors, including our ability to find suitable opportunities for investment, alliance or acquisition; whether we are able to complete an investment, alliance or acquisition on terms that are satisfactory to us; the strength of our underlying technology, products and our ability to execute our business strategies; any intellectual property and litigation related to these products or technology; and our ability to successfully integrate the investment, alliance or acquisition into our existing operations, including to fund our share of any in-process research and development projects. If we are unsuccessful in our business development activities, we may be unable to secure needed capital and expertise to support our development programs and our financial condition could be adversely affected.

We may seek to enter into collaborations, licenses and other similar arrangements and may not be successful in doing so, and even if we are, we may not realize the benefits of such relationships.

We may seek to enter into collaborations, joint ventures, licenses and other similar arrangements for the development or commercialization of our product candidates, due to capital costs required to develop or commercialize the product candidate or manufacturing constraints. We may not be successful in our efforts to establish such collaborations for our product candidates because our research and development pipeline may be insufficient, our product candidates may be deemed to be at too early of a stage of development for collaborative effort or third parties may not view our product candidates as having the requisite potential to demonstrate safety and efficacy or significant commercial opportunity. In addition, we face significant competition in seeking appropriate strategic partners, and the negotiation process can be time consuming and complex. Further, any future collaboration agreements may restrict us from entering into additional agreements with potential collaborators. We cannot be certain that, following a strategic transaction or license, we will achieve an economic benefit that justifies such transaction.

Even if we are successful in our efforts to establish such collaborations, the terms that we agree upon may not be favorable to us, and we may not be able to maintain such collaborations if, for example, development or approval of a product candidate is delayed, the safety of a product candidate is questioned or sales of an approved product candidate are unsatisfactory.

In addition, any potential future collaborations may be terminable by our strategic partners, and we may not be able to adequately protect our rights under these agreements. Furthermore, strategic partners may negotiate for certain rights to control decisions regarding the development and commercialization of our product candidates, if approved, and may not conduct those activities in the same manner as we do. Any termination of collaborations we enter into in the future, or any delay in entering into collaborations related to our product candidates, could delay the development and commercialization of our product candidates and reduce their competitiveness if they reach the market, which could have a material adverse effect on our business, financial condition and results of operations.

We could be adversely affected by any interruption to our ability to conduct business at our current location.

We do not have redundant facilities. We perform substantially all of our research and development and back office activity in a small number of locations, including our headquarters in Warrington, Pennsylvania, research laboratories at a university in Milan, Italy, which are made available to us under a collaboration agreement, and access to a research laboratory at a university in Taipei, Taiwan under a separate collaboration agreement. We also depend upon third-party manufacturers and laboratories to manufacture our drug products and our ADS and perform important API and drug product release testing and stability work.

Our facilities, equipment and inventory would be costly to replace and could require substantial lead time to repair or replace. Our facilities and those of our third-party manufacturers and laboratories may be harmed or rendered inoperable by natural or man-made disasters, including, but not limited to, tornadoes, flooding, fire and power outages, which may render it difficult or impossible for us to perform our research, development and commercialization activities for some period of time. The inability to perform those activities, combined with the time it may take to rebuild our inventory of finished product, may result in the loss of customers or harm to our reputation. With respect to the analytical laboratory at our headquarters facility, any interruption in release and ongoing stability testing could have an adverse impact on our inventories needed to support our ongoing clinical activities and, if approved, commercial activities. Although we have insurance for damage to our property and the disruption of our business, this insurance may not be sufficient to cover all of our potential losses and this insurance may not continue to be available to us on acceptable terms, or at all.

Failure in our information technology systems could disrupt our operations and cause the loss of confidential information and business opportunities.

In the ordinary course of our business, we and our third-party contractors maintain sensitive data on our and their respective networks, including our intellectual property and proprietary or confidential business information relating to our business and that of our clinical trial participants and business partners. The secure maintenance of this sensitive information is critical to our business and reputation. Despite the implementation of security measures, our internal computer systems and those of our third-party contractors are vulnerable to damage from cyber-attacks, computer viruses, unauthorized access, human error, natural disasters, terrorism, war and telecommunication and electrical failures. For information stored with our third-party contractors, we rely upon, and the integrity and confidentiality of such information is dependent upon, the risk mitigation efforts such third-party contractors have in place. Our and our third-party contractors' respective network and storage applications may be subject to unauthorized access by hackers or breached due to operator error, malfeasance or other system disruptions. It is often difficult to anticipate or immediately detect such incidents and the damage caused by such incidents. Such incidents could compromise our intellectual property, expose sensitive business information, cause interruptions in our operations, result in a material disruption of our operations, or require substantial expenditures of resources to remedy.

If we fail to maintain an effective system of internal control over financial reporting, we may not be able to accurately report our financial results, which will likely result in significant legal and accounting expense and diversion of management resources, and current and potential stockholders may lose confidence in our financial reporting and the market price of our stock will likely decline.

Any failure to maintain internal controls could adversely affect our ability to report our financial results on a timely and accurate basis. If our financial statements are not accurate, investors may not have a complete understanding of our operations. If we do not file our financial statements on a timely basis as required by the Securities and Exchange Commission, or the SEC, we could face severe consequences. Inferior internal controls could also cause investors to lose confidence in our reported financial information, which could have a negative effect on the trading price of our common stock. We can give no assurance that material weaknesses or restatements of financial results will not arise in the future due to a failure to implement and maintain adequate internal control over financial reporting or circumvention of these controls. In addition, in the future our controls and procedures may no longer be adequate to prevent or identify irregularities or errors or to facilitate the fair presentation of our consolidated financial statements. Responding to inquiries from the SEC, regardless of the outcome, are likely to consume a significant amount of our management resources and cause us to incur significant legal and accounting expense. Further, many companies that have restated their historical financial statements have experienced a decline in stock price and related stockholder lawsuits.

The failure to prevail in litigation or the costs of litigation, including securities class actions, product liability claims and patent infringement claims, could harm our financial performance and business operations.

Our business activities, including development, manufacture and, if our products are approved, marketing of our drug products and medical devices also exposes us to liability risks. Using our drug product candidates or medical devices, including in clinical trials, may expose us to product liability claims. Even if approved, our products may be subject to claims resulting from unintended effects that result in injury or death. Product liability claims alleging inadequate disclosure and warnings in our package inserts and medical device disclosures also may arise.

We face a potential risk of product liability as a result of the clinical testing of our product candidates and will face an even greater risk if we commercialize any of our product candidates or any other future product. For example, we may be sued if any product we develop, including any of our product candidates, or any materials that we use in our products allegedly causes injury or is found to be otherwise unsuitable during product testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability and a breach of warranties. In the U.S., claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our product candidates. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for any of our product candidates or any future products that we may develop;
- injury to our reputation;
- withdrawal of clinical trial participants;
- costs to defend the related litigation;
- a diversion of management's time, attention and our resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- the inability to commercialize some or all of our product candidates; and
- a decline in the value of our stock.

There can be no assurance that the insurance coverage we maintain is sufficient or will be available in adequate amounts or at a reasonable cost. A successful claim brought against us in excess of available insurance or not covered by indemnification agreements, or any claim that results in significant adverse publicity against us, could have an adverse effect on our business and our reputation.

We may be required to obtain additional product liability insurance coverage. However, such insurance is expensive and may not be available when we need it. In the future, we may not be able to obtain adequate insurance, with acceptable limits and retentions, at an acceptable cost. Any product, general liability or product liability claim, even if such claim is within the limits of our insurance coverage or meritless and/or unsuccessful, could adversely affect the availability or cost of insurance generally and our cash available for other purposes, such as research and development. In addition, such claims could result in:

- uninsured expenses related to defense or payment of substantial monetary awards to claimants;
- a decrease in demand for our drug product candidates;
- damage to our reputation; and
- an inability to complete clinical trial programs or to commercialize our drug product candidates, if approved.

Risks Related to Government Regulation

Adverse safety events or restrictions on use and safety warnings for our products can negatively affect our business, potential future product sales and stock price.

Adverse safety events involving our products under development and our marketed products may have a negative impact on our business. Safety issues with our products could create product liability and could cause additional regulatory scrutiny and requirements for additional labeling, withdrawal of products from the market, and the imposition of fines or criminal penalties. Adverse safety events may also damage physician and patient confidence in our products and our reputation. Any of these could result in liabilities, loss of revenue, material write-offs of inventory, material impairments of intangible assets, goodwill and fixed assets, material restructuring charges and other adverse impacts on our results of operations.

Our activities are subject to various and complex laws and regulations, and we are susceptible to a changing regulatory environment. Any failure to comply could adversely affect our business, financial condition and results of operations.

Our products and our operations are regulated by numerous government agencies, both inside and outside the U.S. Our drug product candidates and medical devices must undergo lengthy and rigorous testing and other extensive, costly and time-consuming procedures mandated by the FDA and foreign regulatory authorities. Our facilities and those of our third-party providers must pass inspection and/or be approved or licensed prior to production and remain subject to inspection at any time thereafter. Failure to comply with the requirements of the FDA or other regulatory authorities could result in warning or untitled letters, product recalls or seizures, monetary sanctions, injunctions to halt the manufacture and distribution of our products, civil or criminal sanctions, refusal of a government to grant approvals or licenses, restrictions on operations or withdrawal of existing approvals and licenses. Any of these actions could damage our reputation and have a material adverse effect on our sales.

If our products are approved for commercial sale, we will be required to comply with not only the requirements of applicable regulators, but will also become subject to various laws regulating the sales, marketing, and distribution of healthcare-related products. The sales and marketing of products and relationships that pharmaceutical and medical device companies have with healthcare providers are under increasing scrutiny by federal, state and foreign government agencies. The FDA and other federal regulators have increased their enforcement activities with respect to the Anti-Kickback Statute, False Claims Act, off-label promotion of products, and other healthcare related laws, antitrust and other competition laws. Foreign governments have also increased their scrutiny of pharmaceutical companies' sales and marketing activities and relationships with healthcare providers.

Of particular importance, federal and state anti-kickback laws make it illegal for a prescription drug manufacturer to solicit, offer, receive, or pay any remuneration in exchange for, or to induce, the referral of business, including the purchase or prescription of a particular drug. These laws can be complicated, are subject to frequent change and may be violated unknowingly. In addition, a number of states require that companies implement compliance programs or comply with industry ethics codes, adopt spending limits, and report to state governments any gifts, compensation, and other remuneration provided to physicians. Sanctions under these laws may include civil monetary penalties, exclusion of a manufacturer's products from reimbursement under government programs (including Medicare and Medicaid), criminal fines, and imprisonment. Companies that have chosen to settle these alleged violations have typically paid multi-million-dollar fines to the government and agreed to abide by corporate integrity agreements, which often include significant and costly burdens.

There has been a recent trend of increased federal and state regulation of payments and transfers of value provided to healthcare professionals and entities. For example, the Physician Payment Sunshine Act imposes annual reporting requirements on certain manufacturers of drugs, medical devices, biologics and medical supplies with respect to payments and other transfers of value provided by them, directly or indirectly, to physicians and teaching hospitals, as well as with respect to certain ownership and investment interests held by physicians and their family members. A manufacturer’s failure to submit timely, accurately and completely the required information regarding all payments, transfers of value or ownership or investment interests may result in civil monetary penalties. Certain states also mandate implementation of commercial compliance programs, impose restrictions on medical device manufacturers’ marketing practices, and require the tracking and reporting of gifts, compensation and other remuneration to healthcare professionals and entities under certain circumstances.

We are continually evaluating our compliance programs, including policies, training and various forms of monitoring, designed to address the requirements outlined above. However, no compliance program can mitigate risk in its entirety. Violations or allegations of violations of these laws may result in large civil and criminal penalties, debarment from participating in government programs, diversion of management time, attention and resources and may otherwise have a material adverse effect on our business, financial condition and results of operations.

We face risks related to our collection and use of data, which could result in investigations, inquiries, litigation, fines, legislative and regulatory action and negative press about our privacy and data protection practices.

Our business processes personal data, including some data related to health. When conducting clinical trials, we face risks associated with collecting trial participants' data, especially health data, in a manner consistent with applicable laws and regulations. We also face risks inherent in handling large volumes of data and in protecting the security of such data. We could be subject to attacks on our systems by outside parties or fraudulent or inappropriate behavior by our service providers or employees. Third parties may also gain access to users' accounts using stolen or inferred credentials, computer malware, viruses, spamming, phishing attacks or other means, and may use such access to obtain users' personal data or prevent use of their accounts. Data breaches could subject us to individual or consumer class action litigation and governmental investigations and proceedings by federal, state and local regulatory entities in the U.S. and by international regulatory entities, resulting in exposure to material civil and/or criminal liability. Further, our general liability insurance and corporate risk program may not cover all potential claims to which we are exposed and may not be adequate to indemnify us for all liability that may be imposed.

As our operations and business grow, we may become subject to or affected by new or additional data protection laws and regulations and face increased scrutiny or attention from regulatory authorities, including various domestic and international privacy and security regulations. The legislative and regulatory landscape for privacy and data protection continues to evolve. In the U.S., certain states may adopt privacy and security laws and regulations that may be more stringent than applicable federal law. For example, California enacted the California Consumer Privacy Act, or CCPA, which takes effect on January 1, 2020. The CCPA creates individual privacy rights for California consumers and increases the privacy and security obligations of entities handling certain personal data. We may also be subject to data protection laws and regulations of other jurisdictions, such as the EU's General Data Protection Regulation, which provides data subjects with certain rights and requires organizations to adopt technical and organizational safeguards to protect personal data. In the event that we are subject to or affected by privacy and data protection laws, including the CCPA, the EU's General Data Protection Regulation, or GDPR, and other domestic or international privacy and data protection laws, we may expend significant resources to comply with such laws, and any liability from failure to comply with the requirements of these laws could adversely affect our financial condition.

Additionally, we are subject to laws and regulations regarding cross-border transfers of personal data, including laws relating to transfer of personal data outside of the European Economic Area, or EEA and Switzerland. We rely on transfer mechanisms permitted under these laws, including EU Standard Contract Clauses. If we cannot rely on existing mechanisms for transferring personal data from the EEA, the United Kingdom, Switzerland or other jurisdictions, we could be prevented from transferring personal data of patients or employees in those regions, all of which could have a material adverse effect on our business, operating results and prospects.

Healthcare reform measures in the U.S., as well as the general tightening of drug reimbursement pathways and levels of reimbursement globally, are expected to add additional pressure to achieve financial expectations for approved products.

If approved, our products are expected to face increasing pricing and reimbursement pressures from payors globally. Such pressures can impair our ability to access patients in geographies or access certain types of patients – regardless of the breadth of our data or approved indications. Pressure from payors, particularly single source government payors and global price referencing, can result in companies being forced to give greater discounts and/or lower pricing than planned resulting in barriers to achieving financial forecasts or even justifying ongoing or additional investment in clinical development programs.

Our international operations subject us to additional regulatory oversight in foreign jurisdictions, as well as economic, social, and political uncertainties, which could cause a material adverse effect on our business, financial position, and operating results.

We are subject to certain risks associated with having assets and operations located in foreign jurisdictions, including our activities in Italy and Taiwan. Our activity in Italy and Taiwan are subject to regulatory agencies, such as the Italian Ministry of Health and the Taiwan Food and Drug Administration. Our operations in foreign jurisdictions may be adversely affected by general economic conditions and economic and fiscal policy, including changes in exchange rates and controls, interest rates and taxation policies, and increased government regulation, which could have a material adverse effect on our business, financial position, and operating results.

We may seek to enter into collaborations, licenses or other similar arrangements for rostafuroxin with a third-party to complete clinical development, development of required analytical methods, drug formulation and companion diagnostic test if needed to commercialize the product candidate. Failure of our efforts to prepare for and develop key analytical method to increase the sensitivity of our existing assay, set the stage for successful drug formulation, other related delays, or failure in obtaining regulatory clearance or approval and, if approved, failure to complete development and gain marketplace acceptance for the genetic test could make it more difficult to enter into a collaborations or could harm our reputation or cause product sales and profitability of rostafuroxin, if approved, to suffer.

We may seek to enter into collaborations, licenses or other similar arrangements for the development or commercialization of rostafuroxin, including all required analytical methods, drug formulation and companion diagnostic test. We are working on an analytical method to increase the sensitivity of our existing assay to measure low concentrations of the compound in the body. In addition, we anticipate a companion diagnostic may be required as a condition to prescribing rostafuroxin. The companion diagnostic for use with rostafuroxin would identify those patients who have a specific genetic profile who may benefit from rostafuroxin treatment for hypertension. Before approval of rostafuroxin, the licensee would be required to have an analytic method to increase sensitivity of our existing assay and a new formulation. In addition, FDA could require additional validation of the genetic test (if it is needed) used in the clinical trials prior to any approval of the drug or the test, or prior to the use of such test in any future clinical trials for rostafuroxin. Each of these measures could require additional time and expense for an uncertain outcome. If we are unable to improve our assay or if the third party we engage to assist us is unable to successfully develop a companion diagnostic, if needed, or experiences delays in doing so or if there are problems with any required test, rostafuroxin may not receive marketing clearance or approval.

If any of these actions were to occur, it could harm our reputation and cause product sales and profitability of rostafuroxin, if approved, to suffer which could adversely affect our business, operating results and prospects.

The FDA and other regulatory agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses. If we are found or alleged to have improperly promoted off-label uses, we may become subject to significant liability.

The FDA and other regulatory agencies strictly regulate the promotional claims that may be made about prescription products, as our product candidates would be, if approved. In general, a product may not be promoted for uses that are not approved by the FDA or in ways that may not be consistent with the product's approved labeling. If we are found to have promoted such off-label uses, we may become subject to significant liability. The federal government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The FDA and other regulatory agencies have also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed. If we cannot successfully manage the promotion of our product candidates, if approved, we could become subject to significant liability, which would materially adversely affect our business and financial condition.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our products.

We face an inherent risk of product liability as a result of the clinical trials of our product candidates and will face an even greater risk if we commercialize our product candidates. For example, we may be sued if our product candidates allegedly cause injury or are found to be otherwise unsuitable during product testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product candidate, negligence, strict liability and a breach of warranties. Claims may be brought against us by clinical trial participants, patients or others using, administering or selling products that may be approved in the future. Claims could also be asserted under state consumer protection acts.

If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit or cease the commercialization of our products. Even a successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our products;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- costs to defend the related litigation;
- a diversion of management's time, attention and our resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- significant negative financial impact;
- the inability to commercialize our product candidates; and
- a decline in our stock price.

We currently hold product liability insurance coverage at a level consistent with our activities. We may need to increase our insurance coverage as we expand our clinical trials or if we commence commercialization of our product candidates. Insurance coverage is increasingly expensive.

Our inability to obtain and retain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of our product candidates. Although we maintain such insurance, any claim that may be brought against us could result in a court judgment or settlement in an amount that is not covered, in whole or in part, by our insurance or that is in excess of the limits of our insurance coverage. Our insurance policies will also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts.

Our employees and independent contractors, including principal investigators, CROs, consultants and vendors, may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk that our employees and independent contractors, including principal investigators, CROs, consultants and vendors may engage in misconduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to us that violate: (1) the laws and regulations of the FDA and other similar regulatory requirements, including those laws that require the reporting of true, complete and accurate information to such authorities, (2) manufacturing standards, including cGMP requirements, (3) federal and state data privacy, security, fraud and abuse and other healthcare laws and regulations in the U.S. and abroad or (4) laws that require the true, complete and accurate reporting of financial information or data. Activities subject to these laws also involve the improper use or misrepresentation of information obtained in the course of clinical trials, the creation of fraudulent data in our preclinical studies or clinical trials, or illegal misappropriation of drug product, which could result in regulatory sanctions and cause serious harm to our reputation. It is not always possible to identify and deter misconduct by employees and other third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. In addition, we are subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and financial results, including, without limitation, the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgements, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, individual imprisonment, contractual damages, reputational harm, diminished profits and future earnings, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

We are subject to anti-bribery, anti-corruption, and anti-money laundering laws, including the U.S. Foreign Corrupt Practices Act, in which violations of these laws could result in substantial penalties and prosecution.

We are exposed to trade and economic sanctions and other restrictions imposed by the U.S. and other governments and organizations. The U.S. Departments of Justice, Commerce, State and Treasury and other federal agencies and authorities have a broad range of civil and criminal penalties they may seek to impose against corporations and individuals for violations of economic sanctions laws, export control laws, the U.S. Foreign Corrupt Practices Act, or the FCPA, and other federal statutes and regulations, including those established by the Office of Foreign Assets Control. The Department of Justice, or DOJ, also has increased its focus on the enforcement of the FCPA, particularly as it relates to the conduct of pharmaceutical companies.

In addition, the U.K. Bribery Act of 2010, or the Bribery Act, prohibits both domestic and international bribery, as well as bribery across both private and public sectors. An organization that "fails to prevent bribery" by anyone associated with the organization can be charged under the Bribery Act unless the organization can establish the defense of having implemented "adequate procedures" to prevent bribery. Under these laws and regulations, as well as other anti-corruption laws, anti-money laundering laws, export control laws, customs laws, sanctions laws and other laws governing our operations, various government agencies may require export licenses, may seek to impose modifications to business practices, including cessation of business activities in sanctioned countries or with sanctioned persons or entities and modifications to compliance programs, which may increase compliance costs, and may subject us to fines, penalties and other sanctions. A violation of these laws or regulations would negatively affect our business, financial condition and results of operations.

We and any of our third-party manufacturers or suppliers may use potent chemical agents and hazardous materials, and any claims relating to improper handling, storage or disposal of these materials could be time consuming or costly.

We and any of our third-party manufacturers or suppliers will use biological materials, potent chemical agents and may use hazardous materials, including chemicals and biological agents and compounds that could be dangerous to human health and safety of the environment. Our operations and the operations of our third-party manufacturers and suppliers also produce hazardous waste products. Federal, state and local laws and regulations govern the use, generation, manufacture, storage, handling and disposal of these materials and wastes. Compliance with applicable environmental laws and regulations may be expensive, and current or future environmental laws and regulations may impair our product development efforts. In addition, we cannot eliminate the risk of accidental injury or contamination from these materials or wastes. We carry a limited amount of specific biological or hazardous waste insurance coverage, and our property, casualty and general liability insurance policies offer limited coverage for damages and fines arising from biological or hazardous waste exposure or contamination. In the event of contamination or injury, we could be held liable for damages or be penalized with fines in an amount exceeding our resources, and our clinical trials or regulatory approvals could be suspended.

Although we maintain workers' compensation insurance for certain costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials or other work-related injuries, this insurance may not provide adequate coverage against potential liabilities.

We maintain a limited amount of insurance for toxic tort claims that may be asserted against us in connection with our storage or disposal of biologic, hazardous or radioactive materials.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations, which have tended to become more stringent over time. These current or future laws and regulations may impair our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions or liabilities, which could materially adversely affect our business, financial condition, results of operations and prospects.

Risks Related to Intellectual Property Matters

If we cannot protect our intellectual property, other companies could use our technology in competitive products. Even if we obtain patents to protect our products, those patents may not be sufficiently broad or they may expire and others could then compete with us.

The patent position of biotechnology companies is highly uncertain and involves complex legal and factual questions for which important legal principles are unresolved. To date, the U.S. Patent and Trademark Office, or USPTO, has not adopted a consistent policy regarding the breadth of claims that is accorded in biotechnology patents or the degree of protection that these types of patents afford. As a result, there are risks that we may not secure proprietary rights to products or processes that appear to be patentable.

The parties who licensed technologies to us and we have filed various U.S. and foreign patent applications with respect to the products and technologies under our development, and the USPTO and foreign patent offices have issued patents with respect to our products and technologies. These patent applications include international applications filed under the Patent Cooperation Treaty. Our pending patent applications, as well as those we may file in the future or those we may license from third parties may not result in the USPTO or foreign patent office issuing patents. In addition, if patent rights covering our products are not sufficiently broad, they may not provide us with sufficient proprietary protection or competitive advantages against competitors with similar products and technologies. For example, the core composition of matter patents covering istaroxime have expired. As such, istaroxime relies on data and market exclusivity, as well as method-of-use patents, which may offer a lesser scope of protection than the original core patents. Furthermore, even if the USPTO or foreign patent offices were to issue patents to us or our licensors, others may challenge the patents or circumvent the patents, or the patent office or the courts may invalidate the patents. Thus, any patents we own or license from third parties may not provide us any protection against competitors.

The patents that we own or in-license have a limited life. Certain of such patents related to lyophilized KL4 surfactant have issued in the U.S., Europe and elsewhere and will expire in March 2033. For our aerosolized KL4 surfactant, we hold worldwide exclusive licenses to our proprietary ADS technology for use with pulmonary surfactants alone or in combination with other products for all respiratory diseases and in the U.S. to other (non-surfactant) drugs to treat certain pediatric and adult respiratory indications in hospitals and other health care institutions. The ADS patents have expired or will expire on various dates beginning in May 2016 and ending as late as 2037. Patents related to our cardiovascular drug products issued in the U.S., Europe and elsewhere have expired or will expire on various dates between 2028 and 2030.

Intellectual property rights of third parties could limit our ability to develop and market our products.

Our success also depends upon our ability to operate our business without infringing the patents or violating the proprietary rights of others. Patent applications in most jurisdictions are not published until 18 months after filing. In certain cases, the USPTO keeps U.S. patent applications confidential for the entire time the applications are pending. As a result, we cannot determine in advance what inventions third parties may claim in their pending patent applications. We may need to defend or enforce our patent and license rights or to determine the scope and validity of the proprietary rights of others through legal proceedings, which would be costly, unpredictable and time consuming. Even in proceedings where the outcome is favorable to us, they would likely divert substantial resources, including management time, from our other activities. Moreover, any adverse determination could subject us to significant liability or require us to seek licenses that third parties might not grant to us or might only grant at rates that diminish or deplete the profitability of our products. An adverse determination could also require us to alter our products or processes or cease altogether any product sales or related research and development activities.

We may need to license intellectual property from third parties, and such licenses may not be available or may not be available on commercially reasonable terms.

We may need to obtain licenses from third parties to advance our research or allow commercialization of our product candidates, and we cannot provide any assurances that third-party patents do not exist which might be enforced against our product candidates in the absence of such a license. The licensing and acquisition of third-party intellectual property rights is a competitive practice and companies that may be more established, or have greater resources than we do, may also be pursuing strategies to license or acquire third-party intellectual property rights that we may consider necessary or attractive in order to commercialize our product candidates. We may fail to obtain any of these licenses on commercially reasonable terms, if at all. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. In that event, we may be required to expend significant time and resources to develop or license replacement technology. If we are unable to do so, we may be unable to develop or commercialize the affected product candidates, which could materially harm our business and the third parties owning such intellectual property rights could seek either an injunction prohibiting our sales, or, with respect to our sales, an obligation on our part to pay royalties and/or other forms of compensation. Licensing of intellectual property is of critical importance to our business and involves complex legal, business and scientific issues. If disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may not be able to successfully develop and commercialize the affected product candidates, which would have a material adverse effect on our business.

We rely on agreements containing obligations regarding intellectual property, confidentiality and noncompetition provisions that could be breached and may be difficult to enforce.

Although we take what we believe to be reasonable steps to protect our intellectual property, including the use of agreements relating to the non-disclosure of our confidential and proprietary information and trade secrets to third parties, as well as agreements that provide for disclosure and assignment to us of all rights to the ideas, developments, improvements, discoveries and inventions of our employees, consultants, advisors and research collaborators while we employ them, such agreements can be difficult and costly to enforce. We generally seek to enter into these types of agreements with consultants, advisors and research collaborators; however, to the extent that such parties apply or independently develop intellectual property in connection with any of our projects, disputes may arise concerning allocation of the related proprietary rights. Such disputes often involve significant expense and yield unpredictable results.

Moreover, although all employees enter into agreements with us that include non-compete covenants, and our five senior executive officers have agreements that include broader non-competition covenants and provide for severance payments that are contingent upon the applicable employee's refraining from competition with us, such non-compete provisions can be difficult and costly to monitor and enforce, such that, if any should resign, we may not be successful in enforcing our noncompetition agreements with them.

Despite the protective measures we employ, we still face the risk that:

- agreements may be breached;
- agreements may not provide adequate remedies for the applicable type of breach;
- our trade secrets or proprietary know-how may otherwise become known;
- our competitors may independently develop similar technology; or
- our competitors may independently discover our proprietary information and trade secrets.

Patents covering our product candidates could be found invalid or unenforceable if challenged in court or before administrative bodies in the U.S. or abroad.

Although an issued patent is presumed valid and enforceable, its issuance is not conclusive as to its validity or its enforceability and it may not provide us with adequate proprietary protection or competitive advantages against competitors with similar product candidates. Competitors could attempt to replicate the competitive advantages we derive from our development efforts, willfully infringe our intellectual property rights, design around the relevant patents, or develop and obtain patent protection for more effective technologies, designs or methods. We may be unable to prevent the unauthorized disclosure or use of our technical knowledge or trade secrets by consultants, suppliers, vendors, former employees and current employees. The laws of some non-U.S. countries do not protect our proprietary rights to the same extent as the laws of the U.S., and we may encounter significant problems in protecting our proprietary rights in these countries.

In addition, proceedings to enforce or defend our patents, or patents to which we have ownership rights through licensing agreements, could put those patents at risk of being invalidated, held unenforceable or interpreted narrowly. Such proceedings could also provoke third parties to assert claims against us, including that some or all of the claims in one or more of those patents are invalid or otherwise unenforceable. If any of the patents covering our product candidates are invalidated or found unenforceable, or if a court found that valid, enforceable patents held by third parties covered one or more of our product candidates, our competitive position could be harmed or we could be required to incur significant expenses to enforce or defend our rights.

Third parties may assert ownership or commercial rights to inventions we develop.

Third parties may in the future make claims challenging the inventorship or ownership of our intellectual property. In addition, we may face claims by third parties that our agreements with employees, contractors or consultants obligating them to assign intellectual property to us are ineffective or in conflict with prior or competing contractual obligations of assignment, which could result in ownership disputes regarding intellectual property we have developed or will develop and interfere with our ability to capture the commercial value of such intellectual property. Litigation may be necessary to resolve an ownership dispute, and if we are not successful, we may be precluded from using certain intellectual property or may lose our exclusive rights in such intellectual property. Either outcome could harm our business and competitive position.

Litigation or other proceedings or third-party claims of intellectual property infringement could require us to spend significant time and money and could prevent us from selling our product candidates or affect our stock price.

Our commercial success will depend in part on not infringing the patents or violating other proprietary rights of others. Significant litigation regarding patent rights occurs in our industry. Our competitors may have applied for or obtained, or may in the future apply for and obtain, patents that will prevent, limit or otherwise interfere with our ability to make, use and sell our product candidates. We do not always conduct independent reviews of patents issued to third parties. In addition, patent applications in the U.S. and elsewhere can be pending for many years before issuance, or unintentionally abandoned patents or applications can be revived, so there may be applications of others now pending or recently revived patents of which we are unaware. Patent applications in the U.S., the EU and elsewhere are published approximately 18 months after the earliest filing for which priority is claimed, with such earliest filing date being commonly referred to as the priority date. These applications may later result in issued patents, or the revival of previously abandoned patents, that will prevent, limit or otherwise interfere with our ability to develop and market our product candidates. Third parties may assert claims that we are employing their proprietary technology without authorization, including claims from competitors or from nonpracticing entities that have no relevant product revenue and against whom our own patent portfolio may have no deterrent effect.

As we attempt to commercialize our product candidates in their current or updated forms, launch new product candidates and enter new markets, we expect competitors may claim that one or more of our product candidates infringe their intellectual property rights as a strategy to impede our commercialization and entry into new markets. The large number of patents, the rapid rate of new patent applications and issuances, the complexities of the technologies involved, and the uncertainty of litigation may increase the risk of business resources and management's attention being diverted to patent litigation. We may in the future receive, letters or other threats or claims from third parties inviting us to take licenses under, or alleging that we infringe, their patents.

Moreover, we may become party to adversarial proceedings regarding our or third-party patent portfolios. Such proceedings could include supplemental examination or contested post-grant proceedings such as review, reexamination, inter parties review, interference or derivation proceedings before the USPTO and challenges in U.S. District Courts. Patents may be subjected to opposition, post-grant review or comparable proceedings lodged in various foreign, both national and regional, patent offices. The legal threshold for initiating litigation or contested proceedings may be low, so that even lawsuits or proceedings with a low probability of success might be initiated. Litigation and contested proceedings can also be expensive and time-consuming, and our adversaries in these proceedings may have the ability to dedicate substantially greater resources to prosecuting these legal actions than we can. We may also occasionally use these proceedings to challenge the patent rights of others. We cannot be certain that any particular challenge will be successful in limiting or eliminating the challenged patent rights of the third party.

Any lawsuits resulting from such allegations could subject us to significant liability for damages and/ or invalidate our proprietary rights. Any potential intellectual property litigation also could force us to do one or more of the following:

- stop making, selling or using product candidates or technologies that allegedly infringe the asserted intellectual property;
- lose the opportunity to license our technology to others or to collect royalty payments;
- incur significant legal expenses, including, in some cases, the attorney's fees and costs of litigation to the party whose intellectual property rights we may be found to be infringing;
- pay substantial damages (possibly treble damages) or royalties to the party whose intellectual property rights on which we may be found to be infringing;
- redesign product candidates that contain the allegedly infringing intellectual property; and
- attempt to obtain a license to the relevant intellectual property from third parties, which may not be available on reasonable terms or at all.

Any litigation or claim against us, even those without merit, may cause us to incur substantial costs, and could place a significant strain on our financial resources, divert the attention of management from our business and harm our reputation. If we are found to infringe the intellectual property rights of third parties, we could be required to pay substantial damages (which may be increased up to three times of awarded damages) and/or substantial royalties and could be prevented from selling our product candidates unless we obtain a license or are able to redesign our product candidates to avoid infringement. Any such license may not be available on reasonable terms, if at all, and there can be no assurance that we would be able to redesign our product candidates in a technically feasible way that would not infringe the intellectual property rights of others. We could encounter delays while we attempt to develop alternative methods or product candidates. If we fail to obtain any required licenses or make any necessary changes to our product candidates or technologies, we may be unable to commercialize one or more of our product candidates.

Even if we were ultimately to prevail, any of these events could require us to divert substantial financial and management resources that we would otherwise be able to devote to our business. Intellectual property litigation, regardless of its outcome, may cause negative publicity, or prohibit us from manufacturing, importing, marketing or otherwise commercializing our product candidates, services and technology. In addition, if the breadth or strength of protection provided by the patents and patent applications we own or in-license is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates. In addition, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments, and if securities analysts or investors view these announcements in a negative light, the price of our common stock could be adversely affected.

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

We also rely upon copyright and trade secret protection, as well as non-disclosure agreements and invention assignment agreements with our employees, consultants and third parties, to protect our confidential and proprietary information.

In addition to contractual measures, we try to protect the confidential nature of our proprietary information using commonly accepted physical and technological security measures. Such measures may not provide adequate protection for our proprietary information. Our security measures may not prevent an employee or consultant from misappropriating our trade secrets and providing them to a competitor, and recourse we take against such misconduct may not provide an adequate remedy to protect our interests fully. Unauthorized parties may also attempt to copy or reverse engineer certain aspects of our product candidates that we consider proprietary. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret can be difficult, expensive and time-consuming, and the outcome of any such claim is unpredictable. Trade secret violations are often a matter of state law, and the criteria for protection of trade secrets can vary among different jurisdictions. In addition, trade secrets may be independently developed or reverse engineered by others in a manner that could prevent legal recourse by us. If any of our confidential or proprietary information, such as our trade secrets, were to be disclosed or misappropriated, or if any such information was independently developed by a competitor, our business and competitive position could be harmed.

We may be unable to enforce our intellectual property rights throughout the world.

Filing, prosecuting and defending patents covering our product candidates in all countries throughout the world would be prohibitively expensive, and the laws of some foreign countries do not protect intellectual property rights to the same extent as the laws of the U.S. Many companies have encountered significant problems in protecting and defending intellectual property rights in certain foreign jurisdictions. This could make it difficult for us to stop infringement of our foreign patents, if obtained, or the misappropriation of our other intellectual property rights. For example, some foreign countries have compulsory licensing laws under which a patent owner must grant licenses to third parties. In addition, some countries limit the enforceability of patents against third parties, including government agencies or government contractors. In these countries, patents may provide limited or no benefit. Patent protection must ultimately be sought on a country-by-country basis, which is an expensive and time-consuming process with uncertain outcomes. Accordingly, we may choose not to seek patent protection in certain countries, and we will not have the benefit of patent protection in such countries. Additionally, in the event that our trademarks are successfully challenged, we could be forced to rebrand our product candidates, which could result in loss of brand recognition and could require us to devote resources to advertising and marketing new brands. Our competitors may infringe our trademarks, and we may not have adequate resources to enforce our trademarks.

Proceedings to enforce our patent or trademark rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business. Accordingly, our efforts to protect our intellectual property rights in such countries may be inadequate.

Third parties may assert that our employees or consultants have wrongfully used or disclosed confidential information or misappropriated trade secrets.

In the future, we may employ individuals who previously worked with other companies, including our competitors. Although we try to ensure that our employees and consultants do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed intellectual property or personal data, including trade secrets or other proprietary information, of a former employer or other third party. Litigation may be necessary to defend against these claims. If we fail in defending any such claims or settling those claims, in addition to paying monetary damages or a settlement payment, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Recent changes in U.S. patent laws may limit our ability to obtain, defend and/or enforce our patents.

The U.S. has recently enacted and implemented wide ranging patent reform legislation. The U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on actions by the U.S. Congress, the U.S. federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that could weaken our ability to obtain new patents or to enforce patents that we have licensed or that we might obtain in the future. Similarly, changes in patent law and regulations in other countries or jurisdictions, changes in the governmental bodies that enforce them or changes in how the relevant governmental authority enforces patent laws or regulations may weaken our ability to obtain new patents or to enforce patents that we have licensed or that we may obtain in the future.

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

The USPTO and other patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. In addition, periodic maintenance and annuity fees on any issued patent are due to be paid to the USPTO and other patent agencies over the lifetime of the patent. While an inadvertent failure to make payment of such fees or to comply with such provisions can in many cases be cured by additional payment of a late fee or by other means in accordance with the applicable rules, there are situations in which non-compliance with such provisions will result in the abandonment or lapse of the patent or patent application, and the partial or complete loss of patent rights in the relevant jurisdiction. Non-compliance events that could result in abandonment or lapse of a patent or patent application include failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents within prescribed time limits. If we or our licensors fail to maintain the patents and patent applications covering our product or if we or our licensors otherwise allow our patents or patent applications to be abandoned or lapse, it can create opportunities for competitors to enter the market, which would hurt our competitive position and could impair our ability to successfully commercialize our product candidates.

We may be unable to obtain a patent term extension in the U.S. under the Hatch-Waxman Act and in foreign countries under similar legislation.

In the U.S., a patent that covers a drug product or medical device approved by the FDA may be eligible for a term extension designed to restore the period of the patent term that is lost during the premarket regulatory review process conducted by the FDA. Depending upon the timing, duration and conditions of FDA marketing approval of our product candidates, it is possible, though unlikely, that one or more of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, or the Hatch-Waxman Act, which permits a patent term extension of up to five years for a patent covering an approved product as compensation for effective patent term lost during product development and the FDA regulatory review process. A patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval, and only claims covering such approved drug product, a method for using it or a method for manufacturing it may be extended, and only one patent may be extended. In the EU, it is possible, though unlikely, that our product candidates may be eligible for term extensions based on similar legislation. However, in either jurisdiction, if we were eligible to apply for patent term extension, we may not receive an extension if we fail to apply within applicable deadlines, fail to apply prior to expiration of relevant patents or otherwise fail to satisfy applicable requirements. Even if we are granted such extension, the duration of such extension may be less than our request. If we are unable to obtain a patent term extension, or if the term of any such extension is less than our request, the period during which we can enforce our patent rights for that product will be in effect shortened and our competitors may obtain approval to market competing products sooner. The resulting reduction of years of revenue from applicable product candidates could be substantial.

Intellectual property rights do not necessarily address all potential threats.

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

- others may be able to make products that are similar to our product candidates or utilize similar technology but that are not covered by the claims of our patents or that incorporate certain technology in our product candidates that is in the public domain;
- we, or our future licensors or collaborators, might not have been the first to make the inventions covered by the applicable issued patent or pending patent application that we own now or may own or license in the future;
- we, or our future licensors or collaborators, might not have been the first to file patent applications covering certain of our or their inventions;
- we may not be able to successfully commercialize our product candidates before our relevant patents we may have, or to which we have ownership rights through licensing agreements, expire;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- it is possible that our current or future pending patent applications will not lead to issued patents;
- issued patents that we hold rights to may be held invalid or unenforceable, including as a result of legal challenges by our competitors or other third parties;
- our competitors or other third parties might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable;
- the patents of others may harm our business; and
- we may choose not to file a patent in order to maintain certain trade secrets or know-how, and a third party may subsequently file a patent covering such intellectual property.

Any of the foregoing could have a material adverse effect on our business, financial condition and results of operations.

Risks Related to this Offering and Ownership of our Common Stock

An active, liquid and orderly market for our common stock may not develop, and you may not be able to resell your common stock at a desired market price.

As of the date of this prospectus, our common stock is traded on the OTCQB quotation system, which is a FINRA-sponsored entity and operated inter-dealer automated quotation system for equity securities not included in a national exchange. Quotation of our securities on the OTCQB limits the liquidity and price of our common stock more than if our common stock were quoted or listed on the New York Stock Exchange, or NYSE, or Nasdaq, which are national securities exchanges. Although we have applied to list our common stock on the Nasdaq, an active trading market for our common stock may never develop or be sustained. The lack of an active market may impair your ability to sell your shares at the time you wish to sell them or at a price that you consider reasonable. An inactive market may also impair our ability to raise capital by selling shares and may impair our ability to acquire other businesses, applications or technologies using our shares as consideration, which, in turn, could materially adversely affect our business**.**

A small group of investors, including Lee's, may be able to exercise significant influence over our business strategy and operations.

As of December 31, 2019, Lee's beneficially owns directly and through its affiliates, approximately 35% of our issued and outstanding shares of common stock and fund affiliates of our Chairman, James Huang, own directly and through affiliates approximately 16.0% of our issued and outstanding common stock. These investors could exercise their voting power in a coordinated fashion to approve any matter requiring shareholder approval by written consent without a stockholder meeting. As a result, there is a risk that these investors could cause corporate actions to be approved even if their interests conflict with the interests of our other stockholders. This concentration of voting power could have the effect of deterring or preventing institutional investors interested in us or a change in control that might be beneficial to our other shareholders.

We have applied to list our common stock on the Nasdaq Capital Market, or Nasdaq. We can provide no assurance that our common stock will qualify to be listed, and if listed, that we will be able to continue to meet Nasdaq listing requirements. If we are successful in obtaining the listing but subsequently fail to comply with the continuing listing standards of Nasdaq, our securities could be delisted.

We have applied to list our common stock on Nasdaq and expect that our plans to meet Nasdaq's initial listing requirements will be successful. However, we can provide no assurance that our application will be approved. If our application is approved and we become listed on Nasdaq, we cannot ensure that we will be able to satisfy the continued listing requirements of Nasdaq after such listing occurs, such as the corporate governance requirements or the minimum closing bid price requirement, and Nasdaq may take steps to delist our common stock. Such a delisting would likely have a negative effect on the price of our common stock and would impair your ability to sell or purchase our common stock when you wish to do so. In the event of a delisting, we can provide no assurance that any action taken by us to restore compliance with listing requirements would allow our common stock to become listed again, stabilize the market price or improve the liquidity of our common stock, prevent our common stock from dropping below the Nasdaq minimum bid price requirement or prevent future non-compliance with Nasdaq's listing requirements.

The market price of our common stock may be highly volatile, and you may not be able to resell your shares at or above the price at which you purchase them.

The market price of our common stock, like that of many other development stage pharmaceutical or biotechnology companies, has been and is likely to be volatile. In addition to general economic, political and market conditions, the price and trading volume of our stock could fluctuate widely in response to many factors, including:

- our ability to execute our ongoing and planned clinical trials on a timely basis consistent with timelines established;
- results of our clinical trials and preclinical studies, and the results of trials of our competitors or those of other companies in our market sector;
- regulatory approval of our product candidates, or limitations to specific label indications or patient populations for its use, or changes or delays in the regulatory review process;
- regulatory developments in the U.S. and foreign countries;
- changes in the structure of healthcare payment systems, especially in light of current reforms to the U.S. healthcare system;
- the scope of protection we are able to establish and maintain for intellectual property rights covering our product candidates, along with any product modifications and improvements;
- the success or failure of our efforts to acquire, license or develop additional product candidates;
- innovations or new products developed by us or our competitors;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- manufacturing, supply or distribution delays or shortages;
- any changes to our relationship with any manufacturers, suppliers, licensors, future collaborators or other strategic partners;
- our expectations regarding the potential market size and the size of the patient populations for our product candidates;
- the implementation of our business model and strategic plans for our business and technology;
- achievement of expected product sales and profitability;
- variations in our financial results or those of companies that are perceived to be similar to us;
- market conditions in the biopharmaceutical sector and issuance of securities analysts' reports or recommendations;
- trading volume of our common stock;
- an inability to obtain additional funding;
- sales of our stock by insiders and stockholders;
- general economic, industry and market conditions other events or factors, many of which are beyond our control;
- our commercialization, marketing and manufacturing prospects and capabilities;
- additions or departures of key personnel; and
- intellectual property, product liability or other litigation against us.

In addition, the stock markets in general, and the markets for biopharmaceutical and biotechnology stocks in particular, have experienced extreme volatility that may have been unrelated to the operating performance of the issuer. These broad market fluctuations may adversely affect the market price or liquidity of our common stock. In the past, when the market price of a stock has been volatile, holders of that stock have sometimes instituted securities class action litigation against the issuer. If any of our stockholders were to bring such a lawsuit against us, we could incur substantial costs defending the lawsuit and the attention of our management would be diverted from the operation of our business.

Future sales and issuances of our common stock or rights to purchase our common stock, stock incentive plans and upon the exercise of outstanding securities exercisable for shares of our common stock, could result in substantial additional dilution of our stockholders, cause our stock price to fall and adversely affect our ability to raise capital.

We will require additional capital to continue to execute our business plan and advance our research and development efforts. To the extent that we raise additional capital through the issuance of additional equity securities and through the exercise of outstanding warrants, our stockholders may experience substantial dilution. We may sell shares of preferred stock or common stock in one or more transactions at prices that may be at a discount to the then-current market value of our common stock and on such other terms and conditions as we may determine from time to time. Any such transaction could result in substantial dilution of our existing stockholders. If we sell shares of our common stock in more than one transaction, stockholders who purchase our common stock may be materially diluted by subsequent sales. Such sales could also cause a drop in the market price of our common stock. The issuance of shares of our common stock in connection with a public or private financing, in connection with our compensation programs, and upon exercise of outstanding warrants will have a dilutive impact on our other stockholders and the issuance, or even potential issuance, of such shares could have a negative effect on the market price of our common stock.

The exercise of stock options and other securities could also cause our stockholders to experience substantial dilution. Moreover, holders of our stock options and warrants are likely to exercise them, if ever, at a time when we otherwise could obtain a price for the sale of our securities that is higher than the exercise price per security of the options or warrants. Such exercises, or the possibility of such exercises, may impede our efforts to obtain additional financing through the sale of additional securities or make such financing more costly. It may also reduce the price of our common stock.

Our securities may be considered a "penny stock," and thereby be subject to additional sale and trading regulations that may make it more difficult to sell.

The SEC has adopted rules that regulate broker-dealer practices in connection with transactions in penny stocks. Penny stocks are generally equity securities with a price of less than $5.00 (other than securities registered on certain national securities exchanges or authorized for quotation on certain automated quotation systems, provided that current price and volume information with respect to transactions in such securities is provided by the exchange or system). The OTCQB does not meet such requirements and if the price of our securities is less than $5.00, our securities will be deemed penny stock. The penny stock rules require a broker-dealer, prior to a transaction in a penny stock not otherwise exempt from those rules, to deliver a standardized risk disclosure document containing specified information. In addition, the penny stock rules require that prior to effecting any transaction in a penny stock not otherwise exempt from those rules, a broker-dealer must make a special written determination that the penny stock is a suitable investment for the purchaser and receive (i) the purchaser's written acknowledgment of the receipt of a risk disclosure statement; (ii) a written agreement to transactions involving penny stocks; and (iii) a signed and dated copy of a written suitability statement. These disclosure requirements may have the effect of reducing the trading activity in the secondary market for our securities, and therefore stock holders may have difficulty selling their shares.

Provisions of our Amended and Restated Certificate of Incorporation, or Certificate of Incorporation, our Amended and Restated By-Laws, or By-Laws, and Delaware law could deter a change of our management and thereby discourage or delay offers to acquire us.

Provisions of our Certificate of Incorporation, our By-Laws and Delaware law may make it more difficult for someone to acquire control of us or for our stockholders to remove existing management and might discourage a third-party from offering to acquire us, even if a change in control or in management would be beneficial to our stockholders. Such provisions may make it costlier for a potential acquirer to engage in a business combination transaction with us. Provisions that have the effect of discouraging, delaying or preventing a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock and could also affect the price that some investors are willing to pay for our common stock.

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

Our Certificate of Incorporation provides that the Court of Chancery of the State of Delaware is the exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a breach of fiduciary duty, any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our Certificate of Incorporation or our By-Laws, or any action asserting a claim against us that is governed by the internal affairs doctrine; provided, that, this provision would not apply to suits brought to enforce a duty or liability created by the Securities and the Exchange Act. These choice of forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees.

If we fail to maintain proper and effective internal control over financial reporting, our ability to produce accurate and timely financial statements could be impaired, investors may lose confidence in our financial reporting and the trading price of our common stock may decline.

Pursuant to Section 404 of Sarbanes-Oxley, we are required to furnish a report by our management on our internal control over financial reporting. We cannot assure you that there will not be material weaknesses or significant deficiencies in our internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition, results of operations or cash flows. If we are unable to conclude that our internal control over financial reporting is effective, or if our independent registered public accounting firm determines we have a material weakness or significant deficiency in our internal control over financial reporting once that firm begin its Section 404 reviews, investors may lose confidence in the accuracy and completeness of our financial reports, the market price of our common stock could decline, and we could be subject to sanctions or investigations by Nasdaq, the SEC or other regulatory authorities. Failure to remedy any material weakness in our internal control over financial reporting, or to maintain effective control systems, could also restrict our future access to the capital markets. This could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

We do not intend to pay dividends on our common stock so any returns will be limited to the value of our stock.

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 return to stockholders will therefore be limited to the appreciation of their stock.

We are a "smaller reporting company," and the reduced disclosure requirements applicable to smaller reporting companies may make our common stock less attractive to investors.

We are a "smaller reporting company" as defined in the Exchange Act and have elected to take advantage of certain of the scaled disclosures available to smaller reporting companies, including simplified executive compensation disclosures in our filings, exemption from the provisions of Section 404(b) of the Sarbanes-Oxley Act requiring that an independent registered accounting firm provide an attestation report on the effectiveness of internal control over financial reporting and certain other decreased disclosure obligations in our SEC filings. We cannot predict whether investors will find our common stock less attractive because of our reliance on any of these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements. All statements other than statements of historical facts contained in this prospectus are forward-looking statements. In some cases, you can identify forward-looking statements by terms such as "may," "will," "should," "expect," "plan," "anticipate," "could," "intend," "target," "project," "contemplate," "believe," "estimate," "predict," "potential" or "continue" or the negative of these terms or other similar expressions, although not all forward-looking statements contain these words. Forward-looking statements include, but are not limited to, statements concerning:

- our estimates regarding future results of operations, financial position, research and development costs, capital requirements and our needs for additional financing;
- the results, cost and timing of our preclinical studies and clinical trials, as well as the number of required trials for regulatory approval and the criteria for success in such trials;
- legal and regulatory developments in the U.S. and foreign countries, including any actions or advice that may affect the design, initiation, timing, continuation, progress or outcome of clinical trials or result in the need for additional clinical trials;
- the difficulties and expenses associated with obtaining and maintaining regulatory approval of our product candidates, and the indication and labeling under any such approval;
- our plans and ability to successfully execute development activities and commercialize our product candidates;
- risks related to manufacturing active pharmaceutical ingredients, drug product, medical devices and other materials we need;
- the size and growth of the potential markets for our product candidates, the rate and degree of market acceptance of our product candidates and our ability to serve those markets;
- the success of competing therapies and products that are or become available;
- our ability to limit our exposure under product liability lawsuits;
- our ability to obtain and maintain intellectual property protection for our product candidates;
- recently enacted and future legislation regarding the healthcare system, including changes to the Patient Protection and Affordable Care Act;
- delays, interruptions or failures in the manufacture and supply of our product candidates;
- the performance of third parties upon which we depend, including third-party contract research organizations, contract manufacturing organizations, contractor laboratories and independent contractors;
- our ability to successfully integrate our company following our acquisition by merger of CVie Investments Limited;
- our ability to recruit or retain key scientific, commercial or management personnel or to retain our executive officers; and
- our ability to maintain proper functionality and security of our internal computer and information systems and prevent or avoid cyberattacks, malicious intrusion, breakdown, destruction, loss of data privacy or other significant disruption.

The forward-looking statements in this prospectus are only predictions and are based largely on our current expectations and projections about future events and financial trends that we believe may affect our business, financial condition and results of operations. These forward-looking statements speak only as of the date of this prospectus and are subject to a number of known and unknown risks uncertainties and assumptions, including those described under the sections in this prospectus entitled "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" and elsewhere in this prospectus. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified and some of which are beyond our control, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements. Moreover, we operate in an evolving environment. New risk factors and uncertainties may emerge from time to time, and it is not possible for management to predict all risk factors and uncertainties. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise.

MARKET AND INDUSTRY DATA

We obtained the industry, market and competitive position data used throughout this prospectus from our own internal estimates and research, as well as from independent market research, industry, medical and general publications and surveys, governmental agencies and publicly available information in addition to research, surveys and studies conducted by third parties. In some cases, we do not expressly refer to the sources from which this data is derived. In that regard, when we refer to one or more sources of this type of data in any paragraph, you should assume that other data of this type appearing in the same paragraph is derived from the same sources, unless otherwise expressly stated or the context otherwise requires. All market and industry data used in this prospectus involve a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates.

In addition, while we believe the industry, market and competitive position data included in this prospectus is reliable and based on reasonable assumptions, such data involve risks and uncertainties and are subject to change based on various factors, including those described in the section titled "Risk Factors." These and other factors could cause results to differ materially from those expressed in the estimates made by the independent parties or by us.

USE OF PROCEEDS

The shares of our common stock being offered by this prospectus are solely for the account of the selling stockholders. We will not receive any proceeds from the sale of these shares by the selling stockholders. However, upon a cash exercise of the warrants by the selling stockholders, we will receive a per share exercise price of $4.03. If the warrants are exercised in a cashless exercise, we will not receive any proceeds from the exercise of the warrants. We will bear all other costs, fees and expenses incurred in effecting the registration of the shares covered by this prospectus, including, without limitation, all registration and filing fees and fees and expenses of our counsel and our accountants.

DIVIDEND POLICY

We have not paid any dividends and we do not anticipate paying any cash dividends in the foreseeable future and we intend to retain all of our earnings, if any, to finance our growth and operations and to fund the expansion of our business. Payment of any dividends will be made in the discretion of our Board of Directors, or the Board, after our taking into account various factors, including our financial condition, operating results, current and anticipated cash needs and plans for expansion.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations together with the consolidated financial statements and the related notes included elsewhere in this prospectus. In addition to historical financial information, the following discussion contains forward-looking statements based upon our current plans, expectations and beliefs that involve risks, uncertainties and assumptions. Our actual results may differ materially from those described in or implied by these forward-looking statements as a result of many factors, including those set forth under the section titled "Risk Factors" and in other parts of this prospectus.

Management's discussion and analysis of financial condition and results of operations, or MD&A, is provided as a supplement to the accompanying consolidated financial statements and footnotes to help provide an understanding of our financial condition, the changes in our financial condition and our results of operations. This item should be read in connection with our Consolidated Financial Statements and notes thereto, or Notes, included in this prospectus.

OVERVIEW

We are a clinical-stage, biopharmaceutical and medical device company focused on the development of novel therapeutics intended to address significant unmet medical needs in important acute care markets. Our development programs are primarily focused in the treatment of acute cardiovascular and pulmonary diseases. Our lead cardiovascular product candidate, istaroxime, is a first-in-class, dual-acting agent being developed to improve cardiac function in patients with acute heart failure, or AHF, as well as raise blood pressure and organ perfusion in cardiogenic shock with a potentially differentiated safety profile from existing treatments. Istaroxime has been granted Fast Track designation for the treatment of AHF by the FDA. Our lead pulmonary product candidate is AEROSURF® (lucinactant for inhalation), a novel drug/medical device combination for non- invasive delivery of our proprietary aerosolized KL4 surfactant, using our proprietary ADS technology for the treatment of RDS in premature infants. AEROSURF has been granted Fast Track designation by the FDA for the treatment of RDS. Our other clinical programs include a lyophilized, or freeze-dried, KL4 surfactant intratracheal suspension for the treatment of RDS and rostafuroxin, a novel medicine for genetically associated hypertension.

The reader is referred to, and encouraged to read in its entirety the Section titled, "Business – Company Overview" in this prospectus, which contains a discussion of our business and business plans, as well as information concerning our proprietary technologies and our current and planned development programs.

RESULTS OF OPERATIONS

Comparison of Nine Months Ended September 30, 2019 and 2018

Net Loss and Operating Loss

The operating loss for the three months ended September 30, 2019 and 2018 was $7.2 million and $3.5 million, respectively. The increase in operating loss from 2018 to 2019 was due to a $3.5 million increase in operating expenses, a $0.1 million decrease in grant revenue, and a $0.1 million decrease in license revenue with affiliate.

The operating loss for the nine months ended September 30, 2019 and 2018 was $20.3 million and $11.3 million, respectively. The increase in operating loss from 2018 to 2019 was due to a $7.7 million increase in operating expenses, a $0.8 million decrease in grant revenue, and a $0.5 million decrease in license revenue with affiliate.

The net loss for the three months ended September 30, 2019 and 2018 was $7.1 million and $3.9 million, respectively. The net loss for the nine months ended September 30, 2019 and 2018 was $20.1 million and $11.5 million, respectively.

Grant Revenue

For the three and nine months ended September 30, 2018, we recognized grant revenue of $0.1 million and $0.7 million, respectively. Grant revenue for the three months ended September 30, 2018 consists of funds received and expended under a Phase II Small Business Innovation Research Grant, or Phase II SBIR, from the National Institute of Allergy and Infectious Diseases, or the NIAID to support continued development of our aerosolized KL4 surfactant as a potential medical countermeasure to mitigate acute and chronic/late-phase radiation-induced lung injury, or the Radiation Grant. Grant revenue for the nine months ended September 30, 2018 consists of funds received and expended under the Radiation Grant and a Phase II SBIR from the National Heart, Lung and Blood Institute, or NHLBI, of the National Institutes of Health, or NIH, to support the AEROSURF phase 2b clinical trial.

License Revenue with Affiliate

(in thousands)	Three Months Ended September 30, 2019	Three Months Ended September 30, 2018	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
License revenue with affiliate	$	$ 159	$ 198	$ 719

License revenue with affiliate represents revenue from a License Agreement with Lee's Pharmaceutical (HK) Ltd., or Lee's (HK), an affiliate of Lee's which together with its affiliates is our largest shareholder, and constitutes a contract with a customer accounted for in accordance with ASC Topic 606. As of June 30, 2019, all revenue related to the License Agreement was recognized and no future material performance obligations are due.

Research and Development Expenses

Our research and development expenses are charged to operations as incurred and we account for such costs by category rather than by project. As many of our research and development activities form the foundation for the development of our KL4 surfactant and drug delivery technologies, they are expected to benefit more than a single project. For that reason, we cannot reasonably estimate the costs of our research and development activities on a project-by-project basis. We believe that tracking our expenses by category is a more accurate method of accounting for these activities. Our research and development costs consist primarily of expenses associated with (a) product development and manufacturing, (b) medical and regulatory operations, and (c) direct preclinical and clinical development programs. We also account for research and development and report by major expense category as follows: (i) salaries and benefits, (ii) contracted services, (iii) raw materials, aerosol devices and supplies, (iv) rents and utilities, (v) depreciation, (vi) contract manufacturing, (vii) travel, (viii) stock-based compensation and (ix) other.

Research and development expenses by category for the three and nine months ended September 30, 2019 and 2018 are as follows:

(in thousands)	Three Months Ended September 30, 2019	Three Months Ended September 30, 2018	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
Product development and manufacturing	$ 1,165	$ 1,053	$ 3,262	$ 4,335
Clinical, medical and regulatory operations	1,734	966	5,339	3,162
Direct preclinical and clinical programs	893	178	1,946	697
Total research and development expenses	$ 3,792	2,197	$ 10,547	$ 8,194

Research and development expenses include non-cash charges associated with stock-based compensation and depreciation of $0.6 and $0.1 million for the three months ended September 30, 2019 and 2018, respectively, and $1.7 and $0.3 million for the nine months ended September 30, 2019 and 2018, respectively.

For a description of our lead development programs included in research and development expenses, see the Section titled "Business."

Product Development and Manufacturing

Product development and manufacturing includes (i) manufacturing operations, both in-house and with CMOs, validation activities, quality assurance and analytical chemistry capabilities that support the manufacture of our drug products used in research and development activities, and our medical devices, including our ADS, (ii) design and development activities related to our ADS for use in our AEROSURF clinical development program; and (iii) pharmaceutical and manufacturing development activities of our drug product candidates including development of istaroxime, lyophilized KL4 surfactant, and rostafuroxin. These costs include employee expenses, facility-related costs, depreciation, costs of drug substances (including raw materials), supplies, quality control and assurance activities, analytical services, and expert consultants and outside services to support pharmaceutical and device development activities.

Product development and manufacturing expenses were consistent for the three months ended September 30, 2019 compared to the same period in 2018. The decrease of $1.1 million for the nine months ended September 30, 2019 compared to the same period in 2018 is due to a reduction of design and development activities on the new ADS for use in our phase 3 program following completion of the design verification activities in mid-2018.

Clinical, Medical and Regulatory Operations

Clinical, medical and regulatory operations include (i) medical, scientific, preclinical and clinical, regulatory, data management and biostatistics activities in support of our research and development programs; and (ii) medical affairs activities to provide scientific and medical education support for our KL4 surfactant and aerosol delivery systems under development. These costs include personnel, expert consultants, outside services to support regulatory and data management, symposiums at key medical meetings, facilities-related costs, and other costs for the management of clinical trials.

Clinical, medical and regulatory operations expenses increased $0.8 million and $2.2 million, respectively, for the three and nine months ended September 30, 2019 compared to the same periods in 2018 primarily due to (i) an increase of $0.4 million and $1.2 million, respectively, in non-cash, stock compensation expense as a result of employee stock option grants in the fourth quarter of 2018 and the first quarter of 2019; (ii) an increase in employee-related incentive bonus accruals of $0.1 million and $0.4 million, respectively; and (iii) an increase of $0.2 million and $0.4 million, respectively, in personnel costs.

Direct Preclinical and Clinical Development Programs

Direct preclinical and clinical development programs include: (i) development activities, toxicology studies and other preclinical studies; and (ii) activities associated with conducting clinical trials, including patient enrollment costs, clinical site costs, clinical device and drug supply, and related external costs, such as consultant fees and expenses.

Direct preclinical and clinical development programs expenses increased $0.7 million and $1.2 million, respectively, for the three and nine months ended September 30, 2019 compared to the same periods in 2018 due to costs associated with continued clinical development of istaroxime and AEROSURF and preclinical activities related to potential follow-on product candidates in AHF.

General and Administrative Expenses

For our lead clinical programs, istaroxime and AEROSURF, we have been engaged in start-up activities related to the next planned clinical studies. With respect to rostafuroxin, we continue to focus on product development work for final formulation to potentially support our planned business development activities.

General and Administrative Expenses

	Three Months Ended September 30,		Nine Months Ended September 30,	
(in thousands)	**2019**	**2018**	**2019**	**2018**
General and administrative expenses	$ 3,395	$ 1,500	$ 9,990	$ 4,634

General and administrative expenses consist of costs for executive management, business development, intellectual property, finance and accounting, legal, human resources, information technology, facility, and other administrative costs.

General and administrative expenses increased $1.9 million and $5.4 million, respectively, for the three and nine months ended September 30, 2019 compared to the same periods in 2018 primarily due to (i) an increase of $1.2 million and $3.0 million, respectively, in non-cash, stock compensation expense as a result of employee stock option grants in the fourth quarter of 2018 and the first quarter of 2019; (ii) an increase of $0.2 million and $0.8 million, respectively, in employee-related incentive bonus accruals; and (iii) an increase of $0.3 million and $1.2 million, respectively, in professional fees, taxes, and insurance.

Other Income and (Expense)

(in thousands)	Three Months Ended September 30, 2019	Three Months Ended September 30, 2018	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
Interest income	$ 25	$ 1	$ 124	$ 9
Interest expense	(105)	(460)	(358)	(642)
Other income	141	-	473	486
Other income, net	$ 61	(459)	$ 239	$ (147)

The increase in interest income for the three and nine months ended September 30, 2019 compared to the same periods in 2018 is due to the increase in cash and marketable securities available-for-sale as a result of the 2018 Private Placement Financing (as defined below).

For the three and nine months ended September 30, 2019, interest expense consists of interest expense associated with collaboration and device development payables and with loans payable. For the three and nine months ended September 30, 2018, interest expense primarily consists of interest expense associated with a $1.5 million convertible note payable, collaboration and device development payables and interest expense related to $2.5 million in loans payable to LPH II Investments Ltd., or LPH II. The decrease in interest expense for the three and nine months ended September 30, 2019 compared to the same periods in 2018 is primarily due to non-cash amortization of the debt discount on the convertible note payable in 2018. The convertible note was paid in its entirety in December 2018.

For the three and nine months ended September 30, 2019, other income primarily consists of $0.1 million and $0.3 million, respectively, in gains on foreign currency translation. For the nine months ended September 30, 2018, other income primarily consists of proceeds from the sale of Commonwealth of Pennsylvania research and development tax credits.

We plan to continue investments in protecting our existing intellectual property, and in pursuing potential additional intellectual property rights, including patents, trademarks, and trade secrets, and regulatory exclusivity designations, such as potential Orphan Drug, new drug product exclusivities, Fast Track, breakthrough therapy, accelerated approval and priority review. See the section titled “Business – Material Licenses and Collaborations.”

Comparison of Years Ended December 31, 2018 and 2017

Net Loss and Operating Loss

The operating loss for the years ended December 31, 2018 and 2017 was $16.2 million and $22.5 million, respectively. The decrease in operating loss from 2017 to 2018 was due to a $6.1 million decrease in operating expenses and a $0.3 million increase in revenue.

The net loss for the years ended December 31, 2018 and 2017 was $20.5 million and $18.4 million, respectively. Included in the net loss is (i) a net loss on debt extinguishment of $3.3 million in 2018; (ii) a gain on debt restructuring of $5.8 million in 2017; (ii) interest expense of $1.4 million and $1.9 million for 2018 and 2017, respectively; and (iv) for 2018, $0.4 million in proceeds from the sale of research and development tax credits.

The net loss attributable to common stockholders for the years ended December 31, 2018 and 2017 was $34.8 million, or $7.74 basic net loss per common share and $24.8 million, or $24.14 basic net loss per common share, respectively. Included in the net loss attributable to common shareholders for 2018 is a $12.5 million non-cash AEROSURF warrant dividend. Included in the net loss attributable to common stockholders for 2018 and 2017 is a $1.7 million and $6.4 million, respectively, non-cash deemed dividend on preferred stock.

Grant Revenue

We recognized grant revenue of $0.8 million and $1.4 million for the years ended December 31, 2018 and 2017, respectively.

Grant revenue for 2018 includes $0.8 million of funds received and expended under a Phase II SBIR from the NHLBI of the NIH to support the AEROSURF phase 2b clinical trial, or the AEROSURF Grant.

Grant revenue for 2017 includes $1.1 million of funds received and expended under the AEROSURF Grant, and $0.3 million of funds under the Radiation Grant.

As of December 31, 2018, all funding under the AEROSURF Grant and the Radiation Grant has been received and recognized in revenue.

License Revenue with Affiliate

We recognized license revenue with affiliates of $1.0 million and $0.1 million for the years ended December 31, 2018 and 2017, respectively, which had previously been included in deferred revenue – current portion. See the section titled "– Critical Accounting Policies – Accrued Research and Development Expenses" below.

Research and Development Expenses

Our research and development expenses are charged to operations as incurred and we account for such costs by category rather than by project. As many of our research and development activities form the foundation for the development of our KL4 surfactant and drug delivery technologies, they are expected to benefit more than a single project. For that reason, we cannot reasonably estimate the costs of our research and development activities on a project-by-project basis. We believe that tracking our expenses by category is a more accurate method of accounting for these activities. Our research and development costs consist primarily of expenses associated with (a) product development and manufacturing, (b) medical and regulatory operations, and (c) direct preclinical and clinical development programs. We also account for research and development and report by major expense category as follows: (i) salaries and benefits, (ii) contracted services, (iii) raw materials, aerosol devices and supplies, (iv) rents and utilities, (v) depreciation, (vi) contract manufacturing, (vii) travel, (viii) stock-based compensation and (ix) other.

Research and development expenses by category for the years ended December 31, 2018 and 2017 are as follows:

(in thousands)	**Year Ended December 31,**	
	2018	**2017**
Product development and manufacturing	$ 5,334	$ 6,537
Clinical, medical and regulatory operations	4,255	5,758
Direct preclinical and clinical programs	973	5,081
Total Research and Development Expenses	$ 10,562	$ 17,376

Research and development expenses include non-cash charges associated with stock-based compensation and depreciation of $0.4 million and $1.0 million for 2018 and 2017, respectively.

Product Development and Manufacturing

Product development and manufacturing includes (i) manufacturing operations, both in-house and with CMOs, validation activities, quality assurance and analytical chemistry capabilities that support the manufacture of our drug products used in research and development activities, and our medical devices, including our ADS, (ii) design and development activities related to our ADS for use in our AEROSURF clinical development program; and (iii) pharmaceutical and manufacturing development activities of our drug product candidates including development of istaroxime, lyophilized KL4 surfactant, and rostafuroxin. These costs include employee expenses, facility-related costs, depreciation, costs of drug substances (including raw materials), supplies, quality control and assurance activities, analytical services, and expert consultants and outside services to support pharmaceutical and device development activities.

Product development and manufacturing expenses decreased $1.2 million from 2017 to 2018, due to (i) our efforts in 2018 to conserve cash and reduce costs and (ii) a July 2017 workforce reduction.

Clinical, Medical and Regulatory Operations

Clinical, medical and regulatory operations include (i) medical, scientific, preclinical and clinical, regulatory, data management and biostatistics activities in support of our research and development programs; and (ii) medical affairs activities to provide scientific and medical education support for our KL4 surfactant and aerosol delivery systems under development. These costs include personnel, expert consultants, outside services to support regulatory and data management, symposiums at key medical meetings, facilities-related costs, and other costs for the management of clinical trials.

Clinical, medical and regulatory operations expenses decreased $1.5 million from 2018 to 2017 due to (i) our efforts in 2018 to conserve cash and reduce costs and (ii) a July 2017 workforce reduction.

Direct Preclinical and Clinical Development Programs

Direct preclinical and clinical development programs include: (i) development activities, toxicology studies and other preclinical studies; and (ii) activities associated with conducting clinical trials, including patient enrollment costs, clinical site costs, clinical device and drug supply, and related external costs, such as consultant fees and expenses.

Direct preclinical and clinical development programs expenses decreased $4.1 million from 2018 to 2017 due to a decrease in AEROSURF phase 2 clinical development program costs following the completion of enrollment in the phase 2a and phase 2b clinical trials during the second quarter of 2017.

Research and Development Expense by Major Expense Category

We also account for our research and development expense by major expense category as shown in the following table:

(in thousands)	**Year Ended December 31, 2018**	**2017**
Contracted services	$ 4,194	$ 8,214
Salaries & benefits	4,029	5,504
Royalties	800	600
Rents and utilities	683	919
Stock-based compensation	232	837
Raw materials, aerosol devices and supplies	195	138
Depreciation	155	178
Travel	109	390
Contract manufacturing	-	355
Other	165	241
	$ 10,562	$ 17,376

Contracted services include third-party costs of preclinical studies, clinical trial activities, certain components of our manufacturing operations, quality control and analytical stability and release testing of our drug product, consulting services, aerosol device design and engineering services, etc. The decrease from 2017 to 2018 is due to the completion of enrollment in the AEROSURF clinical trials in the second quarter of 2017.

The decrease in salaries and benefits of $1.5 million from 2017 to 2018 is due to our continuing efforts, beginning in the second quarter of 2017, to conserve cash resources and implement other cost reduction initiatives.

Royalties represent minimum royalties due under our licensing agreements with Philip Morris USA Inc. and Philip Morris Products S.A. for our ADS technology.

The category “Other” consists primarily of ongoing research and development costs such as insurance, taxes, education and training and software licenses.

General and Administrative Expenses

(in thousands)	Year Ended December 31, 2018	2017
General and administrative expenses	$ 7,421	$ 6,657

General and administrative expenses consist of costs for executive management, business development, intellectual property, finance and accounting, legal, human resources, information technology, facility, and other administrative costs.

General and administrative expenses include non-cash charges associated with stock-based compensation and depreciation of $0.7 million for each of the years ended December 31, 2018 and 2017.

General and administrative expenses increased $0.7 million from 2017 to 2018 due to legal and accounting fees related to the acquisition of CVie Investments Limited, or CVie Acquisition. See Note 3 to the Audited Consolidated Financial Statements contained in this prospectus.

Liquidity and Capital Resources

As of September 30, 2019, we had cash and cash equivalents of $4.4 million and current liabilities of $16.3 million, including $7.8 million of Loans payable. On October 24, 2019, LPH II, an affiliate of Lee's, agreed to lend the Company $1.0 million to fund the Company's operations on an interim basis.

We will need to raise additional capital to continue our operations. Even if we are able to secure such additional capital in the near term, we expect to continue to incur significant losses and will require significant additional capital to support our operations, advance our clinical development programs, and satisfy existing obligations. These conditions raise substantial doubt about our ability to continue as a going concern within one year after the date that the financial statements are issued.

The accompanying financial statements have been prepared on a going concern basis, which contemplates the realization of assets and satisfaction of liabilities in the normal course of business, and do not include any adjustments relating to recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might be necessary should we be unable to continue as a going concern.

As of September 30, 2019, there were 120.0 million shares of common stock and 5.0 million shares of preferred stock authorized under our certificate of incorporation, and approximately 72.0 million shares of common stock and 5.0 million shares of preferred stock available for issuance and not otherwise reserved.

On December 6, 2019, we completed the December 2019 Private Placement for an aggregate purchase price of $26.4 million. We believe that we have cash and cash equivalent resources to fund our business operations into the second quarter of 2021.

Cash Flows

Cash flows for nine months ended September 30, 2019 and 2018

Cash outflows for the nine months ended September 30, 2019, consist of $19.2 million used for operating activities and $1.0 million used for financing activities, offset by cash inflows for the nine months ended September 30, 2019 of $13.9 million for investing activities.

Cash flows for the years ended December 31, 2018 and 2017

Net cash outflows for 2018 consisted of $15.8 million net cash used for ongoing operating activities, $13.7 million of net cash used in investing activities, offset by $38.7 million of net cash provided financing activities.

Operating Activities

Net cash used in operating activities for the nine months ended September 30, 2019 and 2018 was $19.2 million and $9.6 million, respectively. Net cash used in operating activities is a result of our net losses for the period, adjusted for non-cash items and changes in working capital. The increase in net cash used in operating activities is due to the payment of CVie Acquisition costs and private placement financing costs, the payment of pre-existing obligations with the proceeds of the 2018 Private Placement Financing, and continued development of our clinical programs.

Net cash used in operating activities was $15.8 million and $21.0 million for the years ended December 31, 2018 and 2017, respectively. The decrease in net cash used in operating activities from 2017 is attributable to a $6.0 million decrease in operating expenses offset by other changes in working capital.

Investing Activities

Net cash provided by investing activities for the nine months ended September 30, 2019 represents $14.0 million related to the sale of marketable securities, partially offset by $0.1 million in purchase of property and equipment.

Net cash used in investing activities was $13.7 million and $24,000 for the years ended December 31, 2018 and 2017, respectively. The increase in net cash used in investing activities is due to the purchase of $13.9 million of marketable securities with the proceeds from the December 2018 Private Placement Financing.

Financing Activities

Net cash used in financing activities for the nine months ended September 30, 2019 was $1.0 million and represents $0.8 million in principal payments on our loans payable and $0.2 million related to withholding tax payments for net share settlements of restricted stock units.

Net cash provided by financing activities for the nine months ended September 30, 2018 was $8.3 million and represents net loan proceeds of $4.3 million related to loan agreements with LPH Investments Limited, or LPH, $2.5 million in net proceeds from a private placement offering with LPH II, a wholly-owned subsidiary of Lee's, and $1.5 million in proceeds from a convertible note payable.

Net cash provided by financing activities was $38.7 million and $17.3 million for the years ended December 31, 2018 and 2017, respectively, summarized as follows:

(in thousands)	**Year Ended December 31, 2018**	**2017**
Proceeds from private placements, net of expenses	$ 32,893	$ 14,860
Proceeds from loan payable, net of expenses	6,160	3,900
Repayment of loan payable	(160)	--
Proceeds from convertible note payable	1,500	--
Repayment of convertible note payable	(1,500)	--
Payments for taxes related to net share settlements of equity awards	(155)	--
Proceeds from ATM Program, net of expenses	--	1,036
Principal payments on debt restructuring	--	(2,500)
Cash flows from financing activities, net	$ 38,738	$ 17,296

The following sections provide a more detailed discussion of our available financing facilities.

Financings Pursuant to Common Stock Offerings

Historically, we have funded, and expect that we will continue to fund, our business operations through various sources, including financings in the form of equity offerings. Since May 2017, we are no longer eligible to use a universal shelf registration statement on Form S-3. Accordingly, until we are again eligible to use the registration statement on Form S-3, we plan to conduct future equity offerings through private placement transactions.

Private Placement Offerings

On December 6, 2019 we completed a private placement offering with select institutional investors, in which we issued and sold an aggregate of 8,749,999 shares of common stock at a price per share of $3.02, for an aggregate purchase price of approximately $26.4 million. Included in the purchase price, LPH II, an affiliate of Lee's, converted $2.95 million of existing debt obligations on the same terms as the other select institutional investors. In connection with this offering, we issued Series I Warrants to purchase up to an aggregate of 4,375,002 shares of common stock at an exercise price equal to $4.03 per share, which are exercisable on the six-month anniversary of date of issuance and through the five-year anniversary of the date of issuance. The Series I Warrants (i) may be exercised for cash or on a cashless basis if there is no effective registration statement registering the resale of the warrant shares, (ii) may not be exercised to the extent that following such exercise, the holder would beneficially own more than 4.99% (or such other percent as designated by each holder not to exceed 19.99%) of our outstanding shares of common stock, and (iii) contain customary provisions that adjust the exercise price and the number of shares of common stock into which the Series I Warrants are exercisable in the event of a corporate transaction. This Registration Statement on Form S-1 is registering the 8,749,999 shares of common stock sold and 4,375,002 shares of common stock underlying the Series I Warrants.

On December 21, 2018, we completed a private placement offering with select institutional investors for the purchase of an aggregate of 11,785,540 shares of common stock at a price per share of $3.3132, for an aggregate purchase price of approximately $39.0 million, or the 2018 Private Placement Financing. Included in the purchase price, each of LPH II, an affiliate of Lee's, and Battelle converted $6.0 million and $1.0 million, respectively, of existing debt obligations on the same terms as the other select institutional investors. In connection with this offering, we issued (i) Series F Warrants to purchase an aggregate of 2,003,541 shares of common stock at an exercise price equal to $3.68 per share, which are exercisable through the 18-month anniversary of the date of issuance, or the Series F Warrants, and (ii) Series G Warrants to purchase an aggregate of 3,889,229 shares of common stock at an exercise price equal to $4.05 per share, which are exercisable through the 5-year anniversary of the date of issuance, or the Series G Warrants and, together with the Series F Warrants, the December 2018 Warrants. The December 2018 Warrants (i) may not be exercised to the extent that following such exercise, the holder would beneficially own more than 9.99% (or other percent as designated by each holder) of our outstanding shares of common stock, and (ii) contain customary provisions that adjust the exercise price and the number of shares of common stock into which the December 2018 Warrants are exercisable in the event of a corporate transaction.

In April 2018, we completed a private placement with LPH II for the purchase of $2.6 million of our common stock and warrants to purchase our common stock at a purchase price per share of $4.80. In connection with this offering, we issued 541,667 shares of common stock and warrants to purchase 135,417 shares of common stock at an exercise price of $5.52 per share. The warrants are exercisable after 6 months and through the seventh anniversary of the issue date.

In October 2017, we completed a private placement offering with LPH, a company incorporated in the Cayman Islands with limited liability and an affiliate of Lee's, for the purchase of $10.0 million of our common stock at a price of $4.326 per share, which represented a 15% premium over the average of the daily volume-weighted average price per share, or the VWAP, over the 10-day trading period ending on and including the date of the related agreement, and issued in 2,311,604 shares of our common stock. Following the transaction, Lee's beneficially owned 73% of our issued and outstanding shares of common stock. The investment included cancellation of $3.9 million in outstanding loans that we had borrowed from Lee's (HK), a Hong Kong company organized and existing under the laws of Hong Kong under a Loan Agreement dated August 14, 2017, between ourselves and Lee's (HK).

On February 15, 2017, we completed a private placement offering of 7,049 Series A Convertible Preferred Stock units for net proceeds of approximately $10.5 million, including $1.6 million of non-cash consideration in the form of a reduction in amounts due and accrued as of December 31, 2016 for current development services that otherwise would have become payable in cash in the first and second quarters of 2017. Each unit consists of (i) one share of Series A Convertible Preferred Stock, or the Preferred Shares; and (ii) 50 Series A-1 Warrants to purchase one share of common stock at an exercise price equal to $27.40. All outstanding Preferred Shares were converted in accordance with their terms in advance of the CVie Acquisition.

At-the-Market Program (ATM Program)

Stifel ATM Program

In 2013, we entered into an At-the-Market Equity Sales Agreement, or the ATM Agreement with Stifel, under which Stifel, as our exclusive agent, agreed to sell on our behalf up to a maximum of $25 million of shares of our common stock, or the ATM Program. We agreed to pay Stifel a commission equal to 3.0% of the gross sales price of any shares sold pursuant to the ATM Agreement. Effective with our transition to the OTCQB tier in early May 2017, the ATM Program was no longer available to us.

During 2017, we completed registered offerings of our common stock under the ATM Program of 42,357 shares, resulting in aggregate gross and net proceeds to us of approximately $1.1 million and $1.0 million, respectively.

Loans Payable

On October 24, 2019, we entered into a Loan Agreement with LPH II, a Cayman Islands company. Under the Loan Agreement, LPH II agreed to lend us $1,000,000, or the 2019 Loan, to support our operations while we sought to complete a strategic transaction (as defined in the Loan Agreement). The 2019 Loan, which was funded in a single installment by wire transfer on October 28, 2019, accrued interest at a rate of 6% per annum and matured upon the closing date of the December 2019 Private Placement, which qualified as the strategic transaction under terms defined in the Loan Agreement.

In January 2018 and March 2018, LPH, an affiliate of Lee’s, agreed to lend us $1.5 million and $1.0 million, respectively, to support our AEROSURF development activities and sustain our operations while we sought to identify and advance one or more potential strategic initiatives as defined in the related loan agreements, or the Funding Event. The loans accrued interest at a rate of 6% per annum and would mature upon the earlier of the closing date of the Funding Event or December 31, 2018. To secure our obligations under these loans, we granted LPH a security interest in substantially all our assets pursuant to the terms of a Security Agreement dated March 1, 2018, or the LPH Security Agreement. Effective December 5, 2018, LPH assigned all outstanding loans to us to LPH II, a subsidiary of Lee's. In connection with the 2018 Private Placement Financing, we converted to equity $6.0 million of the then outstanding loan payable obligations to LPH II on the same terms as those of the investors in the private placement. Included in the conversion were the $1.5 million and $1.0 million loans and following this conversion of the loans into equity securities, the security interest granted under the LPH Security Agreement was discharged.

During the third and fourth quarters of 2018, LPH agreed to lend us funds to sustain our operations while we continued to work on a strategic transaction. The initial loan was funded on August 14, 2018 in the amount of $0.3 million, and subsequent loans on the following dates and in the following amounts: August 29, 2018, in the amount of $0.48 million, September 12, 2018 in the amount of $0.5 million; September 27, 2018 in the amount of $0.5 million; October 19, 2018 in the amount of $0.43 million; November 2, 2018 in the amount of $0.5 million; November 19, 2018 in the amount of $0.35 million; and December 5, 2018 in the amount of $0.6 million. The loans accrued interest at a rate of 6% per annum and matured upon the earlier of (i) the closing date for the strategic transaction (as defined in the related loan agreements), provided that the Company was able to raise a minimum of $30 million in connection with such transaction, or (ii) March 31, 2019. In each case, we granted to LPH a security interest in substantially all of our assets pursuant to the terms of the LPH Security Agreement.

Extinguishment of Loans Payable

We repaid the 2019 Loan in full upon consummation of the December 2019 Private Placement.

On December 21, 2018, as part of the 2018 Private Placement Financing, we converted $6.0 million of existing loan payable obligations to LPH on the same terms as those of the certain institutional investors of the 2018 Private Placement Financing. In connection of the conversion of Lee’s debt, we issued: (i) 1,810,938 shares of common stock based at $3.3132 per share, (ii) Series F Warrants to purchase 307,859 shares of common stock, at an exercise price equal to $3.68 per share, and (iii) Series G Warrants to purchase 597,610 shares common stock, at an exercise price equal to $4.05 per share. The Series F Warrants are exercisable at any time after the date of issuance and through the 18-month anniversary of the date of issuance and the Series G Warrants may be exercised through the 5-year anniversary of the date of issuance. The conversion of the loan payable to LPH is treated as an extinguishment of debt and does not represent a capital transaction as the 2018 Private Placement Financing included third-party investors and all investors received identical terms. We recorded a loss on extinguishment of debt approximately $3.2 million. The loss was calculated as the difference between: (i) the aggregate fair value of approximately $9.2 million, based on the fair value of the common stock and Series F and Series G Warrants on December 21, 2018, and (ii) the carrying value of the debt liabilities of $6.0 million. The balance of the loan payable to LPH of $160,000 was paid along with accrued interest of $182,000 on December 27, 2018.

Assumption of bank debt as part of the CVie Acquisition

As part of the CVie Acquisition, we assumed approximately $4.5 million in a bank credit facility due in March 2020.

In September 2016, CVie Therapeutics Ltd., or CVie Therapeutics, entered into a 12-month revolving credit facility of approximately $2.9 million with O-Bank to finance operating activities. The facility was later renewed and increased to approximately $5.8 million in September 2017. The credit facility was guaranteed by Lee's, which pledged bank deposits in the amount of 110% of the actual borrowing amount. The guaranty was part of the facility; however, we do not have a written commitment from Lee's to maintain the collateral. Interest, payable in cash on a monthly basis, is determined based on 90-day TAIBOR, or the Taipei Interbank Offer Rate plus 0.91%. The credit facility expired on September 11, 2019 and the loans mature six months after the expiration date, on March 11, 2020. We have initiated a process with O-Bank potentially to extend the maturity date of the facility into 2021.

As of September 30, 2019, the outstanding principal was approximately $4.5 million.

Assumption of Lee's debt as part of the CVie Acquisition

As part of the CVie Acquisition, we assumed approximately $3.5 million of debt payable to Lee's Pharmaceutical International Limited, or Lee's International.

From April 24, 2018 to November 16, 2018, CVie Therapeutics entered into four separate agreements to borrow an aggregate of approximately $3.5 million from Lee's International. The terms of the loan agreements are identical with interest, payable in cash upon maturity, at a rate of 4% per annum and maturing one year from the effective date of the respective loan agreement as follows: $0.5 million in April 2019; $0.3 million in September 2019; $0.2 million in October 2019; and $2.5 million in November 2019.

During the quarter ended March 31, 2019, we made payments of $0.45 million against the April 2018 loan and paid the remaining $50,000 balance plus accrued interest in April 2019. As of September 30, 2019, the outstanding principal of the loans with Lee's International was $3.0 million, which was paid off upon consummation of the December 2019 Private Placement.

Loan payable to Bank Direct Capital Finance

In May 2019, we entered into an insurance premium financing and security agreement with Bank Direct Capital Finance. Under the agreement, we have financed $0.7 million of certain premiums at a 5.35% annual interest rate. Payments of approximately $80,000 are due monthly through March 2020. As of September 30, 2019, the outstanding principal of the loan was $0.4 million.

Convertible Note Payable

On July 2, 2018, we issued to Panacea Venture Management Company Ltd., or Panacea, a Secured Convertible Promissory Note, or the Panacea Note, with respect to a loan facility in the aggregate amount of up to $1.5 million, which was funded in two loans of $1.0 million on the date of the Panacea Note and $0.5 million on July 23, 2018. The Panacea Note had a maturity date of December 31, 2018 and accrued interest at a rate of 15% per annum until the Panacea Note was paid in full or converted into shares of our common stock at a price per share of $4.00. In addition, in lieu of converting the Panacea Note, Panacea could deliver the Panacea Note into a private placement in which Panacea Venture Healthcare Fund I L.P., an affiliate of Panacea, participated. In connection with these loans, we granted to Panacea a security interest in substantially all our assets.

In connection with the Panacea Note, we issued to Panacea warrants, or the Series D Warrants to purchase 187,500 shares, or the Warrant Shares at an exercise price of $4.00 per Series D Warrant Share, or the Exercise Price. The Series D Warrants may be exercised at any time beginning six months after the date of issuance and through the fifth anniversary of the date of issuance. The Series D Warrants may not be exercised to the extent that the holder thereof would, following such exercise, beneficially own more than 9.99% of the Company's outstanding shares of common stock, which percentage may be increased, decreased or waived by such holder upon sixty-one days' notice to us. The Series D Warrants also contain customary provisions that adjust the Exercise Price and the number of Series D Warrant Shares in the event of a corporate transaction.

We recorded the Panacea Note as current debt at its face value of $1.5 million less debt discounts consisting of (i) $0.4 million fair value of the warrants issued in connection with the Panacea Note and (ii) a $0.4 million beneficial conversion feature related to an embedded conversion option that had an effective conversion price that was less than the fair value of the underlying stock at the commitment date. The discount is being accreted to the $1.5 million loan over its term using the effective interest method. The Series D Warrants are derivatives that qualify for an exemption from liability accounting as provided for in ASC Topic 815, Derivatives and Hedging – Contracts in Entity's Own Equity, and have been classified as equity.

The fair value at issuance of the Series D Warrants was determined using the Black-Scholes option-pricing model. The input assumptions used in the valuation are the historical volatility of our common stock price, the expected term of the warrants, and the risk-free interest rate based on the five-year treasury bill rate in effect at the measurement date.

Significant Input Assumptions of Warrant Valuation	
Historical volatility	103%
Expected term (in years)	5
Risk-free interest rate	2.75%

The following amounts comprise the convertible note interest expense for the periods presented:

(in thousands)	**Year Ended December 31, 2018**
Non-cash amortization of debt discounts	$ 833
Cash interest expense	106
Total convertible note interest expense	939

Extinguishment of Panacea Convertible Promissory Note

On December 27, 2018, we repaid the Panacea Note in its entirety in cash of $1.5 million. As part of the extinguishment of debt, we recorded a gain on extinguishment of debt of approximately $0.4 million, relating to the reacquisition of the beneficial conversion option. The gain was calculated using the intrinsic value of the beneficial conversion option, which is the product of: (i) the difference between the common stock price on the date of extinguishment of $5.11 and the conversion price of $4.00, and (ii) 375,000 shares convertible into common stock.

(in thousands)	**December 31, 2018**	**December 31, 2017**
Restructured debt liability - contingent milestone payments	$ 15,000	$ 15,000

On October 27, 2017, we and Deerfield Management Company, L.P., or Deerfield, entered into an Exchange and Termination Agreement pursuant to which (i) promissory notes evidencing a loan with affiliates of Deerfield, or the Deerfield Loan, in the aggregate principal amount of $25 million and (ii) warrants to purchase up to 25,000 shares of our common stock at an exercise price of $786.80 per share held by Deerfield were cancelled in consideration for (i) a cash payment in the aggregate amount of $2.5 million, (ii) 71,111 shares of common stock, representing 2% of fully-diluted shares outstanding (as defined in the Exchange and Termination Agreement) on the closing date, and (iii) the right to receive certain milestone payments based on achievement of specified AEROSURF development and commercial milestones, which, if achieved, could potentially total up to $15 million. In addition, a related security agreement, pursuant to which Deerfield held a security interest in substantially all of our assets, was terminated. We established a $15 million long-term liability for the contingent milestone payments potentially due to Deerfield under the Exchange and Termination Agreement. See Note 5 to the Audited Consolidated Financial Statements contained in this prospectus. The liability has been recorded at full value of the contingent milestones and will continue to be carried at full value until the milestones are achieved and paid or milestones are not achieved and the liability is written off as a gain on debt restructuring.

Off-Balance Sheet Arrangements

We did not have any material off-balance sheet arrangements at September 30, 2019 or 2018, or during the periods then ended.

Critical Accounting Policies

The following discussion and analysis of financial condition and results of operations are based upon our Consolidated Financial Statements, which have been prepared in conformity with U.S. generally accepted accounting principles, or GAAP. Preparing financial statements requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses. Estimates are based on our historical operations, our future business plans and projected financial results, the terms of existing contracts, our observance of trends in the industry, and information available from other outside sources, as appropriate. These estimates and assumptions are affected by the application of our accounting policies. Critical accounting policies and practices are both important to the portrayal of a company's financial condition and results of operations, and require management's most difficult, subjective or complex judgments, often as a result of the need to make estimates about the effects of matters that are inherently uncertain. Actual results could differ from such estimates due to changes in economic factors or other conditions that are outside the control of management. A summary of our significant accounting policies is described in Note 5 of the Audited Consolidated Financial Statements contained in this prospectus. Of those policies, we believe that the following accounting policy is critical to aid our stockholders in fully understanding and evaluating our reported financial results.

Business Combinations

We follow the acquisition method for an acquisition of a business where the purchase price is allocated to the assets acquired and liabilities assumed based on their estimated fair values at the dates of acquisition. The excess costs of acquired businesses over the fair values of the assets acquired and liabilities assumed were recognized as goodwill. The valuations of the acquired assets and liabilities will impact the determination of future operating results. In addition to using management estimates and negotiated amounts, we used a variety of information sources to determine the estimated fair values of the assets and liabilities, including a third-party appraisal for the estimated value of identifiable intangible assets. The business and technical judgment of management and third-party experts was also used in determining the value of identifiable intangible assets.

Goodwill and Intangible Assets

We test goodwill for impairment annually and whenever events or circumstances make it more likely than not that impairment may have occurred, such as a significant adverse change in the business climate or a decision to sell or dispose of a significant business.

We test goodwill for impairment by either performing a qualitative evaluation or a two-step quantitative test. The qualitative evaluation is an assessment of factors, including reporting unit specific operating results as well as industry, market, and general economic conditions, to determine whether it is more likely than not that the fair values of reporting unit is less than its carrying amount, including goodwill. Depending on the factors specific to some or all of our reporting units, we may be required to perform a two-step quantitative test.

We test intangible assets with indefinite lives for impairment annually by either performing a qualitative evaluation or a two-step quantitative test. We perform this test whenever events or changes in circumstances indicate that the related carrying amounts may not be recoverable, and at a minimum, annually.

For the year-ended December 31, 2019 we performed a qualitative evaluation of both goodwill and intangible assets and did not record any impairment charge for 2019.

Revenue recognition

We account for revenue, including license revenue with affiliate, in accordance with ASC Topic 606, *Revenue from Contracts with Customers*, which was adopted on January 1, 2018. This standard applies to all contracts with customers with the exception of contracts that are within the scope of other standards, such as leases, insurance and financial instruments. Under ASC Topic 606, an entity recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration that the entity expects to be entitled in exchange for those goods or services.

We perform the following five steps to recognize revenue under ASC Topic 606: (i) identify the contract(s) with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) the entity satisfies a performance obligation. We only recognize revenue when it is probable that we will collect the consideration to which we are entitled in exchange for the goods or services that will be transferred to the customer.

We have concluded that our government grants are not within the scope of ASC Topic 606 as they do not meet the definition of a contract with a customer. We have concluded that the grants meet the definition of a contribution and are non-reciprocal transactions, and have also concluded that Subtopic 958-605, Not-for-Profit-Entities-Revenue Recognition does not apply, as we are a business entity and the grants are with governmental agencies.

In the absence of applicable guidance under GAAP, effective January 1, 2018, we developed a policy for the recognition of grant revenue when the related costs are incurred and the right to payment is realized.

We believe this policy is consistent with the overarching premise in ASC Topic 606, to ensure that revenue recognition reflects the transfer of promised goods or services to customers in an amount that reflects the consideration that we expect to be entitled to in exchange for those goods or services, even though there is no exchange as defined in ASC Topic 606. We believe the recognition of revenue as costs are incurred and amounts become realizable is analogous to the concept of transfer of control of a service over time under ASC Topic 606.

Prior to January 1, 2018, we recognized revenue as related costs were incurred under the grants given that persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed and determinable, and collectability is reasonably assured. Recognized amounts reflected our performance under the grants and equal direct and indirect costs incurred. Revenue and expenses under these arrangements were presented gross. Revenue recognition under this new policy is not materially different than would have been calculated under the old guidance. As a result of the adoption of this policy, there was no change to the amounts we have historically recorded in our financial statements.

Accrued Research and Development Expenses

As part of the process of preparing our financial statements, we are required to estimate our accrued expenses. This process involves reviewing quotations and contracts, identifying services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost. The majority of our service providers invoice us monthly in arrears for services performed or when contractual milestones are met. We make estimates of our accrued expenses as of each balance sheet date in our financial statements based on facts and circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. The significant estimates in our accrued research and development expenses are related to expenses incurred with respect to CROs, CMOs, clinical trial sites, and other vendors supporting our research and development and manufacturing activities.

We base our expenses related to CROs, CMOs and clinical trial sites on our estimates of services received and efforts expended under quotations and contracts with those vendors that conduct research and development and manufacturing activities on our behalf. The financial terms of these agreements are negotiated, vary from contract to contract and may result in uneven payment flows. At times, payments made to our vendors may exceed the level of services provided and result in a prepayment of the applicable research and development or manufacturing expense. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or prepaid expense accordingly. Although we do not expect our estimates to be materially different from amounts actually incurred, our understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and could result in us reporting amounts that are too high or too low in any particular period. There have been no material changes in estimates for the periods presented.

BUSINESS

Overview

We are a clinical-stage, biopharmaceutical and medical device company focused on the development of novel therapeutics intended to address significant unmet medical needs in important acute care markets. Our development programs are primarily focused in the treatment of acute cardiovascular and pulmonary diseases. Our lead cardiovascular product candidate istaroxime, a first-in-class, dual-acting agent being developed to improve cardiac function in patients with acute heart failure, or AHF, and cardiogenic shock with a potentially differentiated safety profile from existing treatments. Istaroxime demonstrated significant improvement in diastolic and systolic function in phase 2 clinical trials, and has been granted Fast Track designation for the treatment of AHF by the U.S. Food and Drug Administration, or FDA. Our lead pulmonary product candidate is AEROSURF® (lucinactant for inhalation), a novel drug/medical device combination for non-invasive delivery of our proprietary aerosolized KL4 surfactant, using our proprietary Aerosol Delivery System, or ADS, technology for the treatment of respiratory distress syndrome, or RDS, in premature infants. AEROSURF has been granted Fast Track designation by the FDA for the treatment of RDS. Our other clinical programs include a lyophilized, or freeze-dried, KL4 surfactant intratracheal suspension for the treatment of RDS and rostafuroxin, a novel medicine for the treatment of hypertension in patients with a specific genetic profile. We also have a number of pipeline preclinical product candidates that we are evaluating for progression into clinical development.

Our Development Programs

The table below summarizes the current status and anticipated milestones for our principal product development programs.

Product Candidate	Indication	Status	Next Expected Milestone
Istaroxime	AHF	Phase 2b	Initiate start-up activities for second phase 2b clinical trial in ~300 patients in second half of 2020.
Istaroxime	Early Cardiogenic Shock	Phase 2a	Initiate phase 2a clinical trial in ~60 patients first half of 2020.
AEROSURF (aerosolized KL4 surfactant)	RDS	Phase 2b	Initiate in first quarter of 2020 a ~90-patient bridging study with new ADS (developed for use in our phase 3 program), relying on licensee resources.
Rostafuroxin	Genetically Associated Hypertension	Phase 2b	Out-licensing.
Lyophilized KL4 Surfactant	RDS (intratracheal instillate)	Phase 2	Development program under consideration.

Istaroxime (AHF)

Istaroxime is a first-in-class, dual action investigational drug that we are developing to treat AHF with a potentially differentiated safety profile from current AHF therapies. We recently completed a successful phase 2b clinical trial of istaroxime in which the primary endpoint of cardiac function, E/Ea ratio (echocardiographic assessment reflecting changes in pulmonary capillary wedge pressure, or PCWP, or left ventricular filing pressure), was significantly improved. Istaroxime has been granted Fast-Track designation by the FDA for the treatment of AHF.

Heart failure is a chronic, progressive condition in which patients often experience episodic periods of increased symptoms known as AHF, where the heart fails to adequately pump, resulting in worsening symptoms, including pulmonary and peripheral edema and other severe complications. In the United States, or U.S., approximately 6 million people (nearly two percent of the adult population) have heart failure and approximately half of these patients are expected to die within 5 years of diagnosis; and in the combined U.S., European Union, or EU, and Japan markets, there are over 18 million patients suffering from heart failure. AHF can be precipitated by many factors and puts patients at increased risk for morbidity, hospital readmission and mortality. Heart failure is the leading cause of hospitalization in patients age 65 years and older. There are more than 1 million hospital admissions for heart failure in the U.S. each year and over 2.5 million hospital estimated admissions for AHF in the combined U.S., EU and Japan markets. We estimate that AHF may represent a potential addressable market of approximately $1.6 billion dollars annually (in the U.S., EU and Japan).

Istaroxime represents a novel approach to the treatment of AHF. It has a dual mechanism of action referred to as luso-inotropic, to improve cardiovascular physiology. Current therapy for heart failure in the hospital typically includes intravenous diuretics and, if the blood pressure is low, supportive therapy with inotropes. Inotropes are often associated with adverse effects such as hypotension, arrhythmias and, in some cases, increased mortality. These drugs are used only if needed to support blood pressure and cardiac function. We believe that istaroxime, if approved, may have the potential to address unmet medical needs of these patients by improving cardiac function and management of fluid accumulation that contributes to heart failure symptoms with a potentially differentiated safety profile from current AHF therapies, with the potential to reduce both complications and length of hospital stays.

We plan to initiate start-up activities for an additional phase 2b clinical trial of istaroxime in the second half of 2020 in patients with low systolic blood pressure and those who are diuretic resistant. We believe that these difficult to treat patient groups with limited treatment options could particularly benefit from istaroxime's unique profile and potential ability to increase cardiac function, increase blood pressure and improve renal function. We also plan to extend dosing in this clinical trial beyond what was previously studied and include clinical outcome measures that we believe will support the further development of istaroxime.

Istaroxime (Cardiogenic Shock)

We are also exploring istaroxime for the treatment of early cardiogenic shock, a severe presentation of heart failure characterized by very low blood pressure and hypo-perfusion to critical organs which is associated with high mortality and morbidity and is not well treated with current therapies. We believe istaroxime may fulfill an unmet need in cardiogenic shock based on the profile observed in our phase 2 clinical studies in AHF. Because of the unmet need in the treatment of early cardiogenic shock, we believe there may be an opportunity with a Breakthrough Therapy designation, which may provide an expedited development program. Receipt of either Fast Track or Breakthrough Therapy designation may increase the likelihood of receiving priority review of a marketing application, which would provide for an expedited review timeframe. In the first half of 2020 we plan to initiate a small study of istaroxime in early cardiogenic shock patients to evaluate the potential to improve blood pressure and organ perfusion. The study will also evaluate the safety and side effect profile of istaroxime in this patient population.

AEROSURF (lucinactant for inhalation)

AEROSURF is an investigational combination drug/medical device product that we are developing to improve the management of RDS in premature infants RDS is a condition that occurs in premature infants who may not have fully-developed natural lung surfactant, which is essential to normal respiratory function and survival, and may require surfactant therapy to sustain life, and can result in long-term respiratory problems, developmental delays and death. Surfactant therapy is the primary therapy to address an underlying surfactant deficiency, and AEROSURF is designed to deliver aerosolized KL4 surfactant noninvasively using our proprietary ADS technology. We have completed three AEROSURF phase 2 clinical trials. While our most recent phase 2 clinical trial did not achieve its primary endpoint, we believe that the results of our phase 2 clinical program support the further development of AEROSURF to reduce both the rate of nasal continuous positive airway pressure, or nCPAP, failure and the need for intubation in premature infants being treated for RDS. In addition, a pooled post-hoc analysis of data from two phase 2 studies suggests that AEROSURF may have the potential to lower the incidence and severity of bronchopulmonary dysplasia, or BPD, a chronic lung disease of premature infants who have required intubation, mechanical ventilation and oxygen therapy. AEROSURF has been granted Fast-Track designation by the FDA for the treatment of RDS.

RDS is the most prevalent respiratory disease in the neonatal intensive care unit, or NICU. Surfactants currently available in the U.S. are generally administered using invasive endotracheal intubation, frequently with mechanical ventilation, procedures that may result in serious respiratory conditions and other complications. AEROSURF is designed to deliver aerosolized KL4 surfactant noninvasively using our proprietary ADS technology and potentially may meaningfully reduce the use of invasive endotracheal intubation and mechanical ventilation. We believe that AEROSURF, if approved, may meaningfully reduce the number of premature infants who are subjected to invasive surfactant administration, and potentially provide transformative clinical and pharmacoeconomic benefits. In addition, we believe that AEROSURF may support an expansion of the RDS market by reducing the need for intubation and mechanical ventilation, reducing hospital costs, and enabling dosing and repeat dosing as needed using AEROSURF's noninvasive delivery of KL4 surfactant via nCPAP. Moreover, while the current surfactant market represents drug-only revenues, we believe we can capture revenues from both the drug product and the ADS disposable cartridges, supported by anticipated pharmacoeconomic benefits associated with the successful use of nCPAP. We believe that AEROSURF, if approved, may be administered in less specialized hospitals and birthing centers, potentially further expanding access to treatment. We also believe that AEROSURF has the potential to achieve a higher price per patient in an addressable market that could be in excess of $1 billion annually.

We recently completed design verification activities for a newly-designed ADS which combines the same aerosolization technology used during the phase 2 clinical program, but with improved ergonomics, interface, controls, and dose monitoring in a modular design. The new ADS also implements design changes to potentially mitigate the risks of device-related treatment interruptions experienced in the prototype phase 2 device used in the phase 2b clinical trial, and we believe it will be easier and faster to use and may support enhanced clinical outcomes by potentially allowing for reduced time to initial administration of our KL4 surfactant and reduced time intervals between doses compared to our phase 2 prototype.

In the first quarter of 2020, we plan to commence a small, approximately 90-patient, phase 2 bridging study and prepare to transition to our phase 3 clinical program by demonstrating the new ADS performance in the NICU. This trial will not be powered to establish statistical significance but will generate clinical experience with the new ADS as well as additional higher dose treatment data to augment data previously obtained in the phase 2 clinical program. We expect to advance the bridging study at a reduced cost to us by leveraging development opportunities in China (the largest RDS and surfactant market) with our licensee in the region.

Rostafuroxin

Rostafuroxin is a novel investigational drug product candidate that we are developing for the treatment of hypertension in patients with a specific genetic profile. Rostafuroxin targets resistant hypertensive patients with a specific genetic profile, which is found in approximately 20% – 25% of the adult hypertensive population. We have studied rostafuroxin in three phase 2 clinical trials assessing reduction in blood pressure in a hypertensive population selected in accordance with a specified genetic profile. After positive phase 2a results, a phase 2b study was initiated. In this most recent phase 2b clinical trial, rostafuroxin demonstrated efficacy in Caucasian patients but not in Chinese patients. We are exploring potential reasons for the different responses.

According to the Centers for Disease Control, or CDC, patients with high blood pressure have a greater risk for heart disease and stroke, which are the leading causes of death in the U.S. Currently, an estimated 75 million adults, or approximately one third of the adult population in the U.S., have high blood pressure and the incidence is increasing. During 2014, high blood pressure was a primary or contributing cause of death for more than 410,000 adults in the U.S. The estimated annual cost of high blood pressure in the U.S., including for health care services, medications, and missed days of work, is approximately $48 billion. Unfortunately, hypertension is a heterogeneous disease in which a majority of treated patients (50-85% globally) do not reach their therapeutic target blood pressure and patients often have persistent hypertension despite being on multiple therapies. Ethnicity and genetic makeup are known to impact the response to anti-hypertensive treatments, and uncontrolled hypertension has been associated with certain genetic makeups. Given the size of the market and the prevalence of unmet medical needs, major pharmaceutical companies have maintained hypertension as a key area of focus and continue to seek new drugs to compete in markets they have established with previous anti-hypertensive therapies. We plan to develop rostafuroxin and potentially leverage the industry's interest in licensing opportunities in this market.

We are finalizing the rostafuroxin drug formulation and an analytical method to increase the sensitivity of our existing assay to measure low concentrations of the compound in the body. We plan, in 2020, to seek opportunities to out-license rostafuroxin to a larger company that has interest in and/or operates in the very large and broad antihypertension market.

Lyophilized KL4 Surfactant

Our KL4 surfactant can be lyophilized for reconstitution to a liquid just prior to administration. We plan to conduct studies to assess potential reduction of cold chain storage and refrigeration requirements of lyophilized KL4 surfactant in the hospital. We have demonstrated in laboratory experiments that our lyophilized KL4 surfactant retains many of the key attributes and characteristics of our liquid instillate. We are assessing potential development pathways to secure marketing approval for lyophilized KL4 surfactant as an intratracheal instillate for the treatment and/or prevention of RDS. Lyophilized KL4 surfactant is the drug product component of AEROSURF and a lyophilized dosage form of the liquid KL4 surfactant intratracheal instillate, or SURFAXIN®, which was approved by the FDA in 2012. In April 2015, we voluntarily ceased commercializing SURFAXIN to focus our resources on the development of aerosolized KL4 surfactant for respiratory diseases, beginning with AEROSURF. Going forward, if we are able to define an acceptable development program for lyophilized KL4 surfactant that is achievable from a cost, timing and resource perspective, we may seek approval to treat premature infants who, because they are unable to breathe on their own or other reason, are not candidates for AEROSURF.

Other Programs

We are pursuing a number of early exploratory research programs to identify potential product candidates, including oral (and intravenous) SERCA 2a heart failure compounds and other product candidates utilizing our KL4 surfactant and ADS technologies. We believe our KL4 surfactant and ADS technologies may potentially support a product pipeline to address a broad range of serious respiratory conditions in children and adults. We have also worked with Eleison Pharmaceuticals, Inc., or Eleison, a specialty pharmaceutical company developing life-saving therapeutics for rare cancers, to assess the feasibility of using our ADS technology potentially to deliver Eleison's inhaled lipid cisplatin and are contemplating next steps, and under a grant from the National Institutes of Health, or NIH, to address respiratory conditions. If we are able to identify a funding source, including from nondilutive sources such as the NIH, we may consider a collaboration for the further study of this potential opportunity to address rare cancers affecting the lungs.

Our Strategy

We intend to maximize the value of our product candidates and proprietary technologies. Our strategy to achieve this goal includes plans to:

- **Advance istaroxime for the treatment of AHF to a phase 3-ready position**. We plan to complete the istaroxime AHF phase 2b clinical program and develop a strong phase 3-ready position for continued development and potential partnering;

- **Study istaroxime for early cardiogenic shock, which, if the drug demonstrates adequate potential to raise blood pressure with acceptable safety, may create the opportunity with a Breakthrough Therapy designation, for an expedited development program.** In 2020, we plan to initiate a small phase 2a clinical trial in early cardiogenic shock to explore a potential expedited regulatory pathway for istaroxime in this area of unmet medical need;

- **Advance development of preclinical heart failure programs**. To create added value to the istaroxime programs, we plan to our advance oral/chronic and intravenous SERCA2a preclinical product candidates through proof of concept;

- **Advance AEROSURF to a phase 3-ready position**. In 2020, we plan to initiate a small phase 2 bridging study to clinically evaluate the performance of the new ADS in the NICU and introduce a potentially optimized dose regimen. We intend to advance AEROSURF to a phase 3-ready position by leveraging development opportunities in the China (the largest RDS and surfactant market), with our licensee for Asia supporting clinical costs;

- **Seek strategic collaborative relationships for the development and potential commercialization of rostafuroxin**. We are exploring strategic collaborations to out-license and use proceeds to provide non-dilutive funding of our core programs;

- **List our common stock on The Nasdaq Capital Market®**. In 2020, we plan to obtain a listing on the Nasdaq Capital Market, or Nasdaq. We have applied to list our common stock in connection with this offering although there can be no assurance that we will be successful in listing our common stock on Nasdaq; and

- **Execute business development and explore acquiring additional product candidates**. We plan to execute robust business development for partnerships for current development programs as well as explore acquiring additional product candidates to add to our development pipeline.

Our Product Candidates

Istaroxime

Overview

Our lead cardiovascular product is istaroxime, a first-in-class, dual action investigational drug that we are developing to treat AHF and cardiogenic shock. Istaroxime has been evaluated in two phase 2 clinical trials, the results of which suggest that istaroxime may improve cardiovascular physiology as assessed by parameters of pump function, decreases in PCWP, decreases in heart rate, increases in blood pressure without adverse events such as arrhythmias, cardiac damage (as indicated by elevated troponin values) or adverse impact on kidney function. In August 2019, the FDA granted Fast Track designation for istaroxime for the treatment of AHF.

AHF and Cardiogenic Shock Overview

Heart failure can result from structural or functional cardiac abnormalities. Heart failure is a chronic, progressive disease that commonly but episodically worsens to a point of decompensation, where cardiac output fails to meet the body's metabolic needs. The disease is characterized by inadequate pumping function of the heart that results in fluid accumulation manifesting as pulmonary congestion, peripheral edema and congestion in other parts of the body. Insufficient cardiac output can result in inadequate peripheral perfusion that increases the risk of other organ dysfunction such as renal failure. Chronic heart failure is commonly treated with multiple medications including diuretics, inhibitors of neurohumoral imbalances (angiotensin, renin, aldosterone, naturetic peptides) and beta blockers. Effective treatments for AHF are lacking.

Intensification of heart failure therapy in the hospital typically includes intravenous diuretics and, if the blood pressure is low, supportive therapy with inotropes. Inotropes can be associated with adverse effects that include hypotension, arrhythmias and possibly increased mortality. These drugs are used only if needed to support blood pressure and cardiac function.

Cardiogenic shock is a severe presentation of heart failure characterized by very low blood pressure and hypo-perfusion to critical organs. It is associated with high mortality and morbidity and is not well treated with current therapies.

Method of Action

Istaroxime represents a novel approach to the treatment of AHF. It has a dual mechanism of action referred to as luso-inotropic, to improve cardiovascular physiology. First, it activates the SERCA2a calcium pump on the sarcoplasmic reticulum, or SR, leading to enhanced SR calcium uptake and a reduction in cytoplasmic calcium that is thought to improve myocardial relaxation (lusitropic). Second, it inhibits the sodium-potassium ATPase activity leading to improved myocardial contractility (inotropic). See Figure 1.

We believe that this mechanism of action may result in improvement in cardiac function and perfusion to reduce congestion and edema and preserve other organ function while avoiding the side effects associated with other classes of heart failure therapies. Preclinical and phase 2a and phase 2b clinical studies performed to date suggest that istaroxime may improve cardiovascular physiology as assessed by parameters of pump function, decreases in PCWP, decreases in heart rate, increases in blood pressure without an increase in adverse events such as arrhythmias, cardiac damage (as indicated by elevated troponin values) or adverse impact on kidney function. We believe that these features of istaroxime, if approved, could potentially result in clinical improvement of patients' heart failure symptoms and reduce both complications and length of hospital stays when compared to current therapeutic regimens for AHF.

Clinical Development

AHF

Istaroxime has been evaluated in six clinical trials assessing three doses in 280 patients, including two phase 2 clinical trials. In a phase 2a randomized, double-blind, placebo-controlled, dose-escalation clinical trial, 3 doses of istaroxime were evaluated in a study of 120 hospitalized patients (~30 patients per cohort) with AHF and reduced left ventricular ejection fraction with 3 doses of istaroxime administered over a 6-hour infusion period. In this clinical trial, the primary endpoint of lowering of PCWP was significantly improved in all 3 doses relative to placebo, and the certain secondary hemodynamic endpoints (increased systolic blood pressure and decreased heart rate) also improved. The main side effects were vomiting (7.9%) and pain at the infusion site (5.6%); one severe adverse event of ventricular tachycardia was observed. The favorable effects on PCWP, blood pressure and heart rate with potential luso-inotropic effects provided the basis for moving the program forward into a phase clinical 2b trial and for selecting the doses to study.

In January 2019, we announced positive topline results of a phase 2b randomized, double-blind, placebo-controlled, dose-escalation clinical trial, a multicenter, randomized, placebo-controlled study in 120 hospitalized patients in Europe and Asia with AHF that was designed to evaluate two doses of istaroxime administered over a 24-hour infusion period (~ 40 patients per dose group).

The primary endpoint of this study was a change from baseline to 24 hours after start of infusion (Day 1) in E/e' with istaroxime 0.5 or 1.0 µg/kg/min compared to placebo. The E/e' ratio is a marker of the function of the left ventricle, or LV, of the heart and was measured using doppler echocardiography read by a central laboratory. Secondary endpoints included change in other parameters of cardiac function, such as diastolic function, or E/A, stroke volume, or SVI, left ventricle ejection fraction, or LVEF, LV volumes, left atrial, or LA, area, interior vena cava, or IVC, diameter. A 24-hour infusion of istaroxime was associated with significant improvements in cardiac function, in both dosing groups, with a mean E/e' of -4.55 for the 0.5 µg/kg/min group and -3.16 for the 1.0 µg/kg/min group, compared with mean placebo E/e' ratios of -1.55 and -1.08, respectively. Twenty-four-hour infusions of istaroxime were also associated with substantial increases in stroke volume in both dosing groups, with a mean SVI value of 5.33 ml/beat/m^2 for the 0.5 µg/kg/min group and 5.49 ml/beat/m^2 for the 1.0 µg/kg/min group, compared with the mean placebo SVI of 1.65 ml/beat/m^2 and 3.18 ml/beat/m^2, respectively. Importantly, subjects also maintained or increased systolic blood pressure, SBP, with a mean change in SBP of 2.82 mmHg for the 0.5 µg/kg/min group and 6.1 mmHg for the 1.0 µg/kg/min group, compared with the mean placebo SBP values of -2.47 mmHg and 2.7 mmHg, respectively. There were no signs of increased risk for arrhythmias or increased troponin levels (a marker of heart muscle damage) during or after istaroxime infusion. Additionally, blood pressure tended to increase, and heart rate decreased, during the infusion with istaroxime, which may have contributed to the short-term trend toward improvement in renal function. The findings were consistent with the physiologic improvements seen in the phase 2a study and the effects of istaroxime in AHF.

Istaroxime was generally well tolerated. Istaroxime did not appear to be associated with an increase in risk for arrhythmias or increases in cardiac troponin T. Cardiovascular-related adverse events were 23 percent for placebo, 10 percent for istaroxime low dose, and 18 percent for istaroxime high dose with cardiac failure occurring in 3 percent, 5 percent and 8 percent of placebo, low and high dose of istaroxime patients, respectively. These cases of cardiac failure were reported by the investigator as "worsening of heart failure" symptoms that occurred approximately 10-14 days after study drug administration and were not considered to be drug related. The most common adverse drug reactions reported included pain at infusion site, generally associated with use of short catheters, and dose-related gastrointestinal adverse events in 5 percent, 10 percent and 38 percent of placebo, low and high dose istaroxime respectively. Serious adverse events included one cardiac death and one case of cardiogenic shock (in the same patient who died) in the Istaroxime 1.0 mg group, two cases of cardiac failure in the 0.5 mg group, three cases of cardiac failure in the 1.0 mg group, and one case of renal embolism in the 1.0 mg group. There was an additional cardiac death outside the 30-day window.

Based on feedback from the FDA in June 2019 and discussions with our scientific advisors, we are preparing for a phase 2 clinical trial focused on patients with low SBP and those who are diuretic resistant. These two, difficult-to-treat patient groups have limited treatment options and could particularly benefit from the istaroxime unique profile and potential ability to increase cardiac function, increase blood pressure and improve renal function. We plan to initiate this next phase 2 study in the second half of 2020 and plan to extend dosing beyond that previously studied and include clinical outcome measures that we believe may be acceptable for registration.

Cardiogenic Shock

After assessing the regulatory landscape and data from the istaroxime phase 2 clinical program in acute heart failure, we held discussions with our advisors and added to our istaroxime development program a study in early cardiogenic shock. We believe that istaroxime may fulfill an unmet need in early cardiogenic shock based on the profile observed in prior phase 2 clinical studies in AHF, in which istaroxime increased SBP, suggesting that istaroxime could potentially contribute to the clinical improvement of select patients in cardiogenic shock due to heart failure. In addition, we believe there may be opportunities for an abbreviated regulatory pathway and review in cardiogenic shock. According to an FDA published position paper, we believe that approval for early cardiogenic shock potentially could be based on blood pressure changes alone (assuming comparable mortality compared to control patients at 30 days). We plan to execute a small study of istaroxime in early cardiogenic shock patients to evaluate the potential to improve blood pressure and organ perfusion. The study will also evaluate the safety and side effect profile of istaroxime in this patient population. The Company plans to initiate this study in the first half of 2020.

Manufacturing

Istaroxime is manufactured for us by Zhaoke Pharmaceutical (Guangzhou) Co., Ltd. and/or Sigma Tau S.p.A. Secondary packaging by DEPO PACK s.n.c.

The active pharmaceutical ingredient, or API, used in production of the drug product is manufactured by Farmabios S.p.A. and/or ScinoPharm Taiwan, Ltd.

AEROSURF

Overview

AEROSURF® (lucinactant for inhalation) is an investigational combination drug/medical device product that we are developing to improve the management of RDS in premature infants who may not have fully-developed natural lung surfactant and may require surfactant therapy to sustain life. AEROSURF is designed to deliver aerosolized KL4 surfactant noninvasively using our proprietary ADS technology and potentially may meaningfully reduce the use of invasive endotracheal intubation and mechanical ventilation. We believe that AEROSURF, if approved, may meaningfully reduce the number of premature infants who are subjected to invasive surfactant administration, and potentially provide transformative clinical and pharmacoeconomic benefits. The FDA has granted Fast Track designation for AEROSURF to treat RDS.

RDS and BPD Overview

RDS is the most prevalent respiratory disease in the NICU. Surfactant therapy can be a life-saving treatment for RDS and is the primary therapy to address an underlying surfactant deficiency. Unfortunately, surfactants currently available in the U.S. are animal-derived and are generally administered using invasive endotracheal intubation, frequently with mechanical ventilation, procedures that may result in serious respiratory conditions and other complications. We believe that this market has been constrained because of the invasive administration procedures for surfactants and that AEROSURF's non-invasive delivery system may provide a competitive in an expanding RDS market. We also believe that AEROSURF may support an expansion of the RDS surfactant market by reducing the need for intubation and mechanical ventilation, reducing hospital costs, and enabling dosing and repeat dosing as needed using noninvasive delivery of AEROSURF via nCPAP. Moreover, while the current surfactant market represents drug-only revenues, we believe we can capture revenues from both the drug product and the ADS disposable cartridges, supported by anticipated pharmacoeconomic benefits associated with the successful use of nCPAP. We believe that AEROSURF, if approved, may be administered in less specialized hospitals and birthing centers, potentially further expanding access to treatment and potentially achieving a higher price per patient in an addressable market that could be in excess of $1 billion annually.

We are also evaluating AEROSURF for the treatment of BPD, a chronic lung disease of premature infants who have required intubation, mechanical ventilation and oxygen therapy. BPD is associated with ongoing pulmonary disease and neurodevelopmental impairment that contributes to substantial patient morbidity. This is associated with increased health care utilization and higher healthcare costs. Notwithstanding, effective prevention and treatment strategies for BPD have been elusive and there is no approved treatment.

Clinical Development

We have evaluated AEROSURF for the treatment of RDS in premature infants in three phase 2 clinical trials. We believe the results support further exploration of a potentially beneficial treatment effect when the treatment is delivered as intended.

In two phase 2a multicenter, randomized, open-label controlled studies, AEROSURF was generally well-tolerated. Efficacy was an exploratory endpoint in both trials. There was evidence of a beneficial treatment effect in one study. In the other study, there was no difference in rate of nCPAP failure but the assessment was complicated by the occurrence of unanticipated treatment interruptions which may have obscured a potential efficacy signal. In 2017 we completed a phase 2b clinical trial evaluating AEROSURF for the treatment of RDS in premature infants. The clinical trial was a multicenter, randomized, controlled study with masked treatment assignment in 221 premature infants that was designed to evaluate aerosolized KL4 surfactant administered to premature infants 26 to 32 week gestational age receiving nCPAP, in two dose groups (25 and 50 minutes) with up to two potential repeat doses, compared to infants receiving nCPAP alone. This trial was conducted in approximately 50 clinical sites in the U.S., Canada, Europe and Latin America.

AEROSURF did not meet the primary endpoint of a reduction in nCPAP failure at 72 hours. We believe this result was attributable in large part to an unexpected rate of treatment interruptions, which occurred in about 23% of active enrollments, predominantly in the 50-minute dose group. These interruptions, we believe, were primarily related to specific lots of disposable cartridge filters with a higher tendency to clog. After excluding patients in the 50-minute dose group whose dose was interrupted, in accordance with the predesignated statistical plan, nCPAP failure rates were 44% in the control group (n=71) compared to 32% (n=44) in the AEROSURF 50-minute dose group, which is a 12% absolute reduction or a 27% relative reduction in nCPAP failure compared to control. These data suggest a meaningful treatment effect in line with our desired targeted outcome. The overall data suggest that the safety and tolerability profile of AEROSURF was generally comparable to the control group. Reported adverse events and serious adverse events were those that are common and expected among premature infants with RDS and comparable to the control group. As expected, some peridosing events occurred (e.g., changes in oxygen requirements and blood pressure in the time around dosing) more commonly in the AEROSURF groups, however, these were transient in nature and occurred less frequently than seen in intratracheal administration.

In the post hoc pooled analysis of the AEROSURF phase 2b clinical trial and phase 2a clinical trial in infants 26-28 weeks gestational age, AEROSURF treatment was associated with significantly lowered incidence and severity of BPD compared to infants on nCPAP alone. This effect was observed without excluding patients whose treatment was interrupted.

In 2018, we transitioned from our prototype 2 ADS used in the phase 2 clinical program, referred to as the Phase 2 ADS, to a newly-designed ADS for use in our phase 3 program, which combines the same aerosolization technology used during the phase 2 clinical program, but with improved ergonomics, interface, controls, and dose monitoring in a modular design. We successfully concluded design verification activities through a detailed assessment of the new ADS design and implemented design changes to potentially mitigate the risks of device-related treatment interruptions experienced in the prototype phase 2 ADS used in the phase 2b clinical trial. We have conducted extensive performance testing in which the ADS demonstrated consistent performance under rigorous testing and design verification protocols. We believe that the new ADS for use in our phase 3 program will be easier and faster to use and may support enhanced clinical outcomes by potentially allowing for reduced time to initial administration of our KL4 surfactant and reduced time intervals between doses, if required.

As part of the phase 2 clinical program and to prepare to transition to phase 3, in the first quarter of 2020, we plan to commence a small, approximately 90-patient, phase 2 bridging study that is designed to clinically evaluate the performance of our new ADS as well as a more intensive dosing regimen. We expect to advance the bridging study at a reduced cost to us by leveraging development opportunities in China (the largest RDS and surfactant market) with our licensee in the region. This trial will not be powered to establish statistical significance but will generate additional higher dose treatment data to augment data previously obtained in the phase 2b clinical trial.

Manufacturing

KL4 surfactant is comprised of four APIs. Our API suppliers are Bachem Americas, Inc., or Bachem Americas, Corden Pharma and Avanti Polar Lipids, Inc. We have supply agreements for KL4 (sinapultide) and POPG API, and source the other two APIs under purchase orders. Bachem Americas has been our supplier of KL4 since 2008. We received a notice of nonrenewal from Bachem Americas in June 2019 indicating their intent to discontinue the current manufacturing process. We discussed with them potential development of a new manufacturing process for KL4 to meet our future needs. Bachem Americas has agreed to continue manufacturing with the current process thru 2020 and to produce an adequate supply of KL4 to satisfy our needs for the currently planned clinical programs for AEROSURF and lyophilized KL4 surfactant. We have received two comprehensive proposals for the development and validation of a new process for manufacturing KL4 (including one from Bachem Americas). Following initial feasibility studies of the new process, we expect to determine our go forward manufacturer.

Our lyophilized KL4 surfactant is manufactured for us by Pharma Services Group, Patheon, part of Thermo Fisher Scientific, or Patheon. We are currently in discussions with Patheon concerning the wind-down of our Master Services Agreement dated as of October 24, 2013 for the manufacture of lyophilized KL4 surfactant for AEROSURF. Patheon has indicated that it will continue to manufacture lyophilized KL4 surfactant to support our planned AEROSURF clinical trial and will assist us with the technology transfer to another contract manufacturing organization. We plan to seek proposals for the technology transfer and future manufacturing of lyophilized KL4 surfactant from certain entities that we have identified that we believe have appropriate experience to support this program.

In our Warrington laboratory we conduct certain analytical and quality control activities including release testing of all API’s and release and stability testing of our lyophilized and aerosolized KL4 surfactant drug product. We also work with a number of third-party institutions and laboratories that perform various studies as well as quality control release and stability testing.

We have contracted with Clinical Supplies Management, Inc. for the receipt, labeling, packaging and distribution of drug and materials to support our planned AEROSURF bridging study.

With respect to our ADS, we are currently engaged in a technology transfer of our device manufacturing process from Battelle Memorial Institute, or Battelle, to Mack Molding Company, or Mack, an FDA-registered medical device manufacturer that we have engaged to produce the new ADS for use in our phase 3 program and for our planned AEROSURF bridging study, and potentially address the unexpected rate of treatment interruptions in our phase 2b trial. If AEROSURF is approved for marketing, we expect that the new ADS for use in our phase 3 program will also support our commercial market platform. We currently have a Memorandum of Understanding with Mack to cover this transfer.

Rostafuroxin

Overview

Rostafuroxin is a novel investigational drug product candidate that we are developing for the treatment of hypertension in patients with a specific genetic profile. Rostafuroxin targets resistant hypertensive patients with a specific genetic profile, which is found in approximately 20% – 25% of the adult hypertensive population.

Hypertension Overview

According to the CDC, patients with high blood pressure have a greater risk for heart disease and stroke, which are the leading causes of death in the U.S. Currently, an estimated 75 million adults, or approximately one third of the adult population in the U.S., have high blood pressure and the incidence is increasing. During 2014, high blood pressure was a primary or contributing cause of death for more than 410,000 adults in the U.S. The estimated annual cost of high blood pressure in the U.S., including for health care services, medications, and missed days of work, is approximately $48 billion. Unfortunately, hypertension is a heterogeneous disease in which a majority of treated patients (50-85% globally) do not reach their therapeutic target blood pressure and patients often have persistent hypertension despite being on multiple therapies. Ethnicity and genetic makeup are known to impact the response to anti-hypertensive treatments, and uncontrolled hypertension has been associated with certain genetic makeups. Given the size of the market and the prevalence of unmet medical needs, major pharmaceutical companies have maintained hypertension as a key area of focus and continue to seek new drugs to compete in markets they have established with previous anti-hypertensive therapies. We plan to develop rostafuroxin and potentially leverage the industry's interest in licensing opportunities in this market.

Method of Action

Rostafuroxin is designed to be a selective antagonist of adducin polymorphisms and endogenous ouabain, both known triggers of hypertension, and creates functional effects by enhancing renal tubular sodium reabsorption and increasing vascular tone.

Clinical Development

Rostafuroxin has been studied in three phase 2 clinical trials assessing reduction in blood pressure in a hypertensive population selected in accordance with a specified genetic profile. A phase 2b clinical trial was conducted as a two-part study with the first part conducted in Italy with Caucasian patients and the second part conducted in Taiwan with ethnic Chinese patients. The efficacy results in Italy were positive in both this trial and in an earlier phase 2a clinical trial; however, the blood pressure response in Chinese patients in the second part of the phase 2b study was minimal. We are analyzing the results of these clinical trials potentially to identify the reasons for the minimal response in Chinese patients. We are finalizing the drug formulation and working on an analytical method to increase the sensitivity of our existing assay to measure low concentrations of the compound in the body. Once we have developed an improved, room temperature formulation, we plan to seek opportunities to out-license rostafuroxin to a larger company that has interest in and/or operates in the very large and broad antihypertension market.

Manufacturing

The drug product for rostafuroxin is manufactured by Doppel Farmaceutici S.r.l. The API used in the manufacture of rostafuroxin is manufactured by China Gateway Pharmaceutical Development Co., Ltd.

Lyophilized KL4 Surfactant – Other Studies

Our KL4 surfactant can be lyophilized (freeze-dried) and reconstituted to a liquid just prior to administration. We currently maintain continuous cold chain storage for this product. We are assessing potential development pathways to secure marketing approval for lyophilized KL4 surfactant as an intratracheal instillate for the treatment and/or prevention of RDS. Lyophilized KL4 surfactant is the drug product component of AEROSURF and a lyophilized (freeze-dried) dosage form of the liquid KL4 surfactant intratracheal instillate, or SURFAXIN®, that was approved by the FDA in 2012. In April 2015, we voluntarily ceased commercializing SURFAXIN to focus our resources on the development of aerosolized KL4 surfactant for respiratory diseases, beginning with AEROSURF.

We plan to conduct studies to assess potential reduction of cold chain storage and refrigeration requirements in the hospital. We have demonstrated in laboratory experiments that our lyophilized KL4 surfactant retains many of the key attributes and characteristics of our liquid instillate. We previously discussed with the FDA a potential development plan, trial design and regulatory plan for approval and plan potentially to re-engage with the FDA. If we can define an acceptable development program that is achievable from a cost, timing and resource perspective, we may seek approval to treat premature infants who, because they are unable to breathe on their own or other reason, are not candidates for AEROSURF.

In addition, on March 12, 2018, we announced a collaboration with Eleison, a specialty pharmaceutical company developing life-saving therapeutics for rare cancers. We worked with Eleison to assess the feasibility of using our ADS technology potentially to deliver Eleison's inhaled lipid cisplatin, or ILC, and under a grant from the NIH to address respiratory conditions. Eleison is developing ILC for non-small cell lung cancer and completed a phase 2 study of ILC in patients with bone cancer (osteosarcoma) metastatic to the lung. If we are unable to identify a funding source, including from nondilutive sources such as the NIH, we may consider a collaboration for the further study of this potential opportunity to address rare cancers affecting the lungs.

We believe our lyophilized KL4 surfactant and ADS technologies may potentially support a product pipeline to address a broad range of serious respiratory conditions in children and adults. We have received support, and plan to seek additional support, from the NIH and other government funding sources to explore the utility of our KL4 surfactant to address a variety of such respiratory conditions as acute lung injury, or ALI, including acute radiation exposure to the lung (acute pneumonitis and delayed lung injury), chemical-induced ALI, and influenza-induced ALI; as well as chronic rhinosinusitis, complications of certain major surgeries, mechanical ventilator-induced lung injury, often referred to as VILI, pneumonia, and diseases involving mucociliary clearance disorders, such as chronic obstructive pulmonary disease and cystic fibrosis, or CF.

Other Preclinical Product Candidates

We continue to advance our preclinical follow-on oral and intravenous SERCA 2a heart failure compounds and are actively exploring partnership opportunities for these potential product candidates as well.

Material Licenses and Collaborations

Lee's Pharmaceutical (HK) Ltd.

We are party to a License, Development and Commercialization Agreement, as amended, or the License Agreement, as amended, with Lee's (HK), a company organized under the laws of Hong Kong and an affiliate of Lee's. Under the License Agreement, we granted to Lee's (HK) an exclusive license with a right to sublicense (i) to develop, manufacture and commercialize our KL4 surfactant products, including SURFAXIN, which was approved by the FDA in 2012 for RDS in premature infants, SURFAXIN LS™, the lyophilized dosage form of SURFAXIN, and AEROSURF, and (ii) to register and manufacture SURFAXIN and SURFAXIN LS for use in the licensed territory, which includes China, Japan, Hong Kong, Thailand, Taiwan and 12 other countries. Under the License Agreement Lee's (HK) made an upfront payment to us of $1 million. We also may receive up to $35.8 million in potential clinical, regulatory and commercial milestone payments and will share in any sublicense income Lee's (HK) may receive at a rate equal to low double digits. In addition, Lee's (HK) is responsible for all costs and expenses in and for the Licensed Territory related to development activities, including a planned AEROSURF phase 3 clinical program, regulatory activities, and commercialization activities.

We will be eligible to receive tiered royalties based on a percent of Net Sales (as defined in the License Agreement), depending on the product, in the range of high single to low-to-mid double-digit percentages. Royalties are payable on a country-by-country basis until the latest of (i) the expiration of the last valid patent claim covering the product in the country of sale, (ii) the expiration or revocation of any applicable regulatory exclusivity in the country of sale, and (iii) ten (10) years after the first commercial sale in the country of sale. Thereafter, in consideration of licensed rights other than patent rights, royalties shall continue for the commercial life of each product and, for the initial three years, shall be in the range of low-to-mid single digits. In addition, in the event that one or more generic products are introduced, the royalty rates will be reduced, subject to certain minimums if we are subject to continuing obligations at the time to pay royalties under our in-license agreements.

Under the License Agreement, Lee's (HK) is responsible for all activities related to development, regulatory approval and commercialization of KL4 surfactant and combination drug / device products in the licensed territory. Lee's (HK) will hold the product licenses for all non-aerosolized products in the licensed territory and will seek regulatory approval initially for SURFAXIN and SURFAXIN LS for RDS. We will hold the product license in the licensed territory (except where prohibited by law) for all aerosolized products and will designate Lee's (HK) its exclusive agent and representative to develop and register AEROSURF and other aerosolized products in our name and on our behalf. Lee's (HK) also has agreed that, except as provided in the License Agreement, for a period of ten (10) years beginning with the later of the first commercial sale of the first aerosolized product and the first commercial sale of the first non-aerosolized product in China, it will not develop, register, manufacture, or commercialize any product for the prevention and/or treatment of RDS in premature infants or other diseases and conditions in humans, in either case, that administers, utilizes or contains pulmonary surfactant without our prior written consent.

The term of the License Agreement will continue on a country-by-country basis for the commercial life of the products. Either party may terminate the License Agreement in the event of bankruptcy or a material breach of the License Agreement by the other party that remains uncured for a period of sixty (60) days. In addition, either party may terminate the License Agreement in its entirety or with respect to any individual product or country if a regulatory authority terminates, suspends or discontinues development of a product and such termination, suspension or discontinuance persists for a period in excess of eighteen (18) months. Upon termination of the License Agreement in its entirety or with respect to a particular product or country, generally all related rights and licenses granted to Lee's (HK) will terminate, all rights under our technology will revert to us, and Lee's (HK) will cease all use of our technology.

Battelle Collaboration Agreement

In October 2014, we entered into a Collaboration Agreement with Battelle, or the Battelle Collaboration Agreement, for the development of our new ADS for use in our phase 3 program. We had previously worked with Battelle, which has expertise in developing and integrating aerosol devices using innovative and advanced technologies, in connection with development of our prototype phase 2 ADS used in the AEROSURF phase 2b clinical trial. Under the Battelle Collaboration Agreement, we and Battelle shared the costs of development for a three-stage development plan that included (i) defining the requirements and a detailed project plan for a new ADS for use in our phase 3 program, (ii) executing the project plan, and (iii) completing required testing, verification and documentation, putting us in a position to manufacture a new ADS for use in the remaining AEROSURF development activities, including in our phase 3 program, and, if approved, in initial commercial activities. We agreed that, if Battelle successfully completed the project plan in a timely manner, we would pay Battelle royalties equal to a low single-digit percentage of the worldwide net sales and license royalties on sales of AEROSURF for the treatment of RDS in premature infants, up to an initial aggregate limit of $25 million, which under the Battelle Payment Restructuring (discussed below) was increased to $35 million. The Battelle Collaboration Agreement will end at the time we fulfill our payment obligations to Battelle, unless sooner terminated by a party as provided therein.

In December 2018, we and Battelle entered into a Payment Restructuring Agreement, or the Battelle Payment Restructuring, which reflected the terms of an October 2017 nonbinding memorandum of understanding, in which we outlined terms to restructure approximately $4.3 million then due to Battelle, or the Battelle Payables, under a Research and Development Services Agreement dated as of June 22, 2012 and the Battelle Collaboration Agreement. Under the Battelle Payment Restructuring, Battelle Payables accrue interest at a rate of 6% per annum. In December 2018 we exchanged $1.0 million of the debt for shares of our common stock. And since December 2018 we have paid $2.2 million of the Battelle Payables. In addition, we have agreed to make two milestone payments to Battelle as follow: (i) upon enrollment of the first patient in the next AEROSURF clinical study, an amount equal to one half of the then-outstanding Battelle Payables (including unpaid interest), and (ii) when we complete the device technology transfer for the new ADS for use in our phase 3 program to Mack, an amount equal to the then-outstanding Battelle Payables, including unpaid interest.

Laboratorios del Dr. Esteve, S.A.

We have a strategic alliance with Laboratorios del Dr. Esteve, S.A., or Esteve, for the development, marketing and sales of a portfolio of potential KL4 surfactant products in Andorra, Greece, Italy, Portugal, and Spain, or, collectively, the Territory. Under the alliance, Esteve will pay us a transfer price on sales of our KL4 surfactant products. We are responsible for the manufacture and supply of all covered products and Esteve will be responsible for all sales and marketing in the territory. Esteve is obligated to make stipulated cash payments to us upon our achievement of certain milestones, primarily upon receipt of marketing regulatory approvals for the covered products. In addition, Esteve has agreed to contribute to phase 3 clinical trials for the covered products by conducting and funding development performed in the Territory. As part of a 2004 restructuring, Esteve returned certain countries to us, referred to as the Former Esteve Territories, and we agreed to pay Esteve 10% of any cash up front and milestone fees (up to a maximum aggregate of $20 million) that we receive in connection with any strategic collaborations for the development and/or commercialization of certain of our KL4 surfactant products in the Former Esteve Territories. In addition, with respect to our aerosolized KL4 surfactant, Esteve will pay us $0.5 million upon the initial filing for regulatory approval with the European Medicines Agency, or EMA, and $0.5 million upon receipt of regulatory approval. Esteve will also contribute up to $3 million to support a phase 3 clinical trial in the Territory. The alliance will terminate as to each covered product, on a country-by-country basis, upon the latest to occur of: the expiration of the last patent claim related to a covered product in such country; the first commercial sale in such country of the first-to-appear generic formulation of the covered product, and the tenth anniversary of the first sale of the covered product in such country. In addition to customary termination provisions for breach of the agreement by a party, the alliance agreement may be terminated by Esteve on 60 days' prior written notice, up to the date of receipt of the first marketing regulatory approval, or, on up to six months' written notice, if the first marketing regulatory approval has issued. We may terminate the alliance agreement in the event that Esteve acquires a competitive product (as defined in the agreement).

Università degli Studi di Milano-Bicocca

In April 2015, CVie Therapeutics Ltd., or CVie Therapeutics, entered into an Agreement for Scientific Collaboration, or the 2015 Agreement, with the Università degli Studi di Milano-Bicocca, or Bicocca, in Milan, Italy, focused on defining the role of sarco (endo) plasmic reticulum Ca2+ -ATPase 2a, or SERCA2a, and phospholamban, or PLN, in modulating cardiac contraction, and discovering new small molecules to modulate SERCA2a activity or new drugs for treating chronic and acute human heart failure. The initial term of the 2015 Agreement was three years but the term was extended for approximately an additional year, with option for further renewal. In June 2019, we entered into a second Agreement for Scientific Collaboration with Bicocca, or the 2019 Agreement, focused on continuing the studies under the 2015 Agreement. The 2019 Agreement supersedes and replaces all prior agreements with Bicocca.

Under the 2015 Agreement, we provided funds aggregating € 0.2 million (approximately $0.22 million) to upgrade equipment and pay laboratory expenses for the renewal term expiring in 2019. We also funded several related research contracts for the period covered by the 2015 Agreement. In connection with our research activities, Bicocca agreed to provide us exclusive use of a research laboratory for the collaboration work, and nonexclusive access to a physiology laboratory within the university. Bicocca serves as our primary location in Milan. Under the 2019 Agreement, we have agreed to provide funds aggregating € 0.16 million (approximately $0.178 million) to extend our use of Bicocca laboratories and to fund research conducted pursuant to the collaboration.

Under the 2019 Agreement, results obtained from the collaboration will be jointly owned by the parties. However, Bicocca will assign to us its interest in patent applications and patents covering any new SERCA2a compounds and diagnostic products suitable for further clinical development. We have agreed to pay Bicocca (corresponding to stage of development): (i) € 0.1 million (approximately $0.11 million) for new SERCA2a compounds developed up to phase 1 studies in humans upon the completion and availability of the proof of concept of biological efficacy of new compounds on modulating the SERCA2a activity in cell-free systems, or its functional counterpart in cardiac myocytes; and (ii) € 1.5 million (approximately $1.7 million) upon obtaining marketing authorization in the U.S., EU, or China of new compounds with the corresponding companion diagnostic assay. We have also agreed to pay royalties on products generated from the collaboration in the range of a fraction of a single digit to a low single digit percent of net sales for any products sold in any country for a period of ten years from the date of the first commercial sale or until the expiry of patent(s) covering the products.

Philip Morris USA Inc. and Philip Morris Products S.A. License

In 2008, we entered into an Amended and Restated License Agreement with Philip Morris USA, Inc., or PMUSA, with respect to the U.S., or the U.S. License Agreement, and, as PMUSA had assigned its ex-U.S. rights to Philip Morris Products S.A., or PMPSA, effective on the same date and on substantially the same terms and conditions, we entered into a license agreement with PMPSA with respect to rights outside of the U.S., which we refer to, together with the U.S. License Agreement, as the PM License Agreements.

Pursuant to the PM License Agreements, we have worldwide exclusive rights to the medical device component of our AEROSURF product candidate. We are currently developing a new ADS for use in our phase 3 program and potentially for use in our remaining AEROSURF development activities, and, if approved, initial commercial activities. Our ADS technology and our new ADS for use in our phase 3 program are protected by a portfolio of issued patents, as well as pending and new patent applications, covering the core components of the system. These patents and applications will expire on dates ranging from 2018 to 2037, with the core patents expiring in 2033 or later.

Under the PM License Agreements, we are obligated to pay royalties at a rate equal to a low single-digit percent of sales of products sold in the Exclusive Field (as defined in the PM License Agreements) in the territories. In connection with exclusive undertakings of PMUSA and PMPSA not to exploit the aerosol technology for all licensed uses, we are obligated to pay royalties on all product sales, including sales of certain aerosol devices that are not based on the licensed aerosol technology; provided, however, that no royalties are payable to the extent that we exercise our right to terminate the license with respect to a specific indication. We also have been required to pay minimum royalties quarterly but are entitled to reduce future quarterly royalties above the quarterly minimums in the amount of the true-up payments we make to satisfy minimum royalties for prior quarters. Our license rights extend to innovations to the aerosol technology that are made under the PM License Agreements.

In addition to customary termination provisions for breach of the agreements, we may terminate the PM License Agreements, in whole or in part, upon advance written notice to the licensor. In addition, either party to each PM License Agreement may terminate upon a material breach by the other party (subject to a specified cure period). Our license under each PM License Agreement, unless terminated earlier, will expire as to each licensed product, on a country-by-country basis, upon the latest to occur of: the date on which the sale of such licensed product ceases to be covered by a valid patent claim in such country; the date a generic form of the product is introduced in such country; or the tenth anniversary of the first commercial sale of such licensed product.

Intellectual Property

We continue to invest in maintaining and enforcing our potential competitive position through a number of means: (i) by protecting our exclusive rights in our cardiovascular agents including istaroxime, rostafuroxin and potential follow-on compounds, (ii) by protecting our exclusive rights in our lyophilized KL4 surfactant, ADS and aerosol-conducting airway connector technologies through patents that we own or exclusively license, (iii) by seeking regulatory exclusivities, including potential Orphan Drug and new drug product exclusivities, and (iv) through protecting our trade secrets and proprietary methodologies that support our manufacturing and analytical processes.

Patents and Proprietary Rights

In addition to the inventions covered by the patents and patent applications described in this prospectus, we have been active in identifying and seeking to identify new patents. We have filed and plan to file patent and provisional patent applications to protect our innovations relating to our current and potential future product candidates, including for composition of matter, new dosage forms, formulations, methods of manufacture, methods of use and related processes. We intend to file for patent protection for select inventions, in such markets that we deem material to our patent strategy, as well as for other new inventions that we may identify.

Rostafuroxin Patent

Our subsidiary, CVie Therapeutics holds a patent portfolio of six patent families that include over 40 patents and patent filings directed to compounds, pharmaceutical formulations, methods of manufacturing, methods of delivery, and treatment methods using derivatives of rostafuroxin for the treatment of cardiovascular diseases and related conditions. We plan to continue these patent activities and focus on new follow-on compounds, dosage forms, formulations, and treatment methods related to AHF and persistent hypertension. At this time, the patents originally covering istaroxime composition of matter have expired. To benefit from potential non-patent exclusivity within the U.S., we believe that we may qualify istaroxime as a new chemical entity entitled to market exclusivity for a period of years. See the section titled “– Government Regulation – Drug Products – The Hatch-Waxman Act – Market Exclusivity”.

Rostafuroxin-Related Patents

In June 2008, international patent application PCT/EP2008/056928 was filed and directed to rostafuroxin derivatives useful for the prevention or treatment of restenosis after angioplasty or endarterectomy as well as diseases resulting from organ fibrosis. The international application entered into the national phase in the U.S., European Patent Office, or EPO, and several other foreign jurisdictions. In this patent family, multiple foreign counterparts are pending or granted. U.S. Patent Application No. 12/602,827 was abandoned following an unsuccessful appeal of a decision of the U.S. Patent Office examiner. European Patent No. 2160190B1 will expire on June 4, 2028.

In March 2010, international patent application PCT/EP2010/053571 was filed and directed to rostafuroxin derivatives for the treatment of proteinuria, glomerulosclerosis, and renal failure. The international patent application entered into the national phase in the EPO (EP10709529.1, now European Patent No. 2411015B1), U.S., and multiple other foreign nations. U.S. Patent Application No. 13/258,728 was abandoned on June 2, 2016 in favor of child application U.S. 14/931,083, now U.S. Patent No. 9,868,757. U.S. Patent No. 9,868,757 and European Patent No. 2411015B1 will expire on March 18, 2030.

In October 2010, international patent application PCT/EP2010/065589 was filed covering methods of rostafuroxin administration for the treatment or prevention of cardiovascular conditions in individuals with various single nucleotide polymorphisms, or SNPs, associated with improved therapeutic response to rostafuroxin administration. The international patent application entered into the national phase in the EPO (EP10807525.0, now European Patent No. 2490694B1), U.S. (U.S. 13/502,518, now U.S. Patent No. 9,408,854), and multiple other foreign nations. U.S. Patent No. 9,408,854 and European Patent No. 2490694B1 will expire on October 18, 2030.

Johnson & Johnson Patents

Our precision-engineered KL4 surfactant technology was invented at The Scripps Research Institute, or Scripps, and was exclusively licensed to and further developed by Johnson & Johnson, or J&J. We received an exclusive, worldwide license and sublicense from J&J and its wholly-owned subsidiary, Ortho Pharmaceutical Corporation, to a series of over 30 patents and patent filings (worldwide), or the J&J Patents. All J&J Patents have expired. Under the license agreement, we are obligated to pay the licensors fees of up to $3.0 million in the aggregate upon our achievement of certain milestones, primarily upon receipt of marketing regulatory approvals for certain designated products. We have made milestone payments totaling $1.0 million to date. In addition, the agreement provides that we are required to pay royalties at different rates based on the type of revenue and country, in amounts in the range of a high single-digit percent of net sales (as defined in the license agreement) of licensed products sold by us or sublicensees, or, if greater, a percentage of royalty income from sublicensees in the low double digits. The license agreement provides that the license will expire, on a country-by-country basis, upon the payment of royalties for all licensed products for ten years beginning on the date of the first commercial sale of the first licensed product in such country. Thereafter, the license agreement provides that royalties shall be paid in respect of a licensed product until the expiration of the last licensed patent containing a valid claim covering the licensed product in such country. For countries in the EU in which royalties are paid only by virtue of licensed know-how, royalties shall be payable commencing from the date of first commercial sale of the first licensed product in such country and ending on the earlier of (i) the date on which the licensed know-how becomes public or (ii) the tenth anniversary of the first commercial sale of the first licensed product in any country of the EU. In addition to customary termination provisions for breach of the agreement by a party, we may terminate the agreement, as to countries other than the U.S. and Western Europe territories (as defined in the agreement), on a country-by-country basis, on six months' prior written notice; and as to the entire agreement, on 60 days' prior written notice.

Our KL4 -Related Patents and Patent Rights

We have been active in seeking patent protection for our innovations relating to new dosage forms, formulations and methods of manufacturing and delivering synthetic peptide containing pulmonary surfactants. Our patent activities have focused particularly on improved dosage forms and delivery of aerosolized pulmonary surfactant.

In January 2006, we filed U.S. and International patent applications (U.S. 11/326,885 which is now U.S. Patent No 7,541,331 issued on June 2, 2009 and PCT/US06/000308, now entered national phase), directed to a surfactant treatment regimen for BPD. U.S. Patent No 7,541,331 will expire on January 6, 2026. European Patent No. 1841458B1 was revoked on December 11, 2018, following an unsuccessful appeal of a decision of the EPO Opposition Division.

In September 2007, we filed U.S. and International patent applications (U.S. 11/901,866 which is now U.S. Patent No. 8,221,772 and PCT US/2007/020260, now entered national phase) directed to surfactant compositions and methods of promoting mucus clearance and treating pulmonary disorders such as cystic fibrosis. U.S. Patent No. 8,221,772 will expire on September 19, 2027.

In March 2013, we filed International patent applications (PCT/US13/34364 and PCT/US13/34464, now entered national phase and commenced expedited examination in the U.S. and EPO) directed to lyophilized pulmonary surfactant and methods of manufacture. In this patent family, two U.S. Patents Nos. 8,748,396 and 8,748,397 were issued on June 10, 2014, European patent 2723323B1 issued on September 23, 2015, another U.S. Patent No. 9,554,999 B2 issued on January 31, 2017 and multiple foreign counterparts are pending or granted. U.S. Patents Nos. 8,748,396; 8,748,397 and 9,554,999 B2 and European Patent No.2723323B1will expire on March 28, 2033.

Aerosol-Conducting Airway Connector Technology Patents and Patent Rights

In March 2009, we filed an International patent application (PCT US/2009/037409, now entered national phase) directed to aerosol-conducting airway connectors and improvements of an ADS using AFECTAIR®. The claims of this application are directed to a novel ventilation circuit adaptor (an aerosol-conducting airway connector) and related aerosol circuitry that are intended to (i) increase the efficiency of aerosol delivery to the patient by allowing more efficient delivery of aerosols to the patient, and (ii) reduce drug compound dilution and wastage and result in more precise aerosol dosing. In this patent family, U.S. Patent No. 8,701,658 was issued on April 22, 2014, European patent No. 2265309 was issued on December 16, 2015, U.S. Patent No. 9,352,114 was issued on May 31, 2016, U.S. Patent No. 9,592,361 was issued on March 14, 2017 and several foreign patents have issued during 2011 through 2017. U.S. Patent No. 8,701,658 and U.S. Patent No. 9,352,114 will expire on March 17, 2029. U.S. Patent No. 9,592,361 will expire on September 9, 2033. European Patent No. 2265309 will expire on March 17, 2029.

Trademarks

AEROSURF®, AFECTAIR®, SURFAXIN®, SURFAXIN LS™, WINDTREE THERAPEUTICS® (logo)**,** WINDTREE™ and WINDTREE THERAPEUTICS™ are our material registered and common law trademarks.

Trade Secrets

In addition to our patent exclusivities, we rely on trade secrets to protect and maintain our competitive position. We take measures to protect and maintain our trade secrets and know-how licensed to us or developed by us by entering in confidentiality agreements with third parties. Our trade secrets and know-how include information related to manufacturing processes for our drug products and devices, analytical methods and procedures, research and development activities, provisional patent applications, as well as certain information provided to the FDA that was not made public which relates to our regulatory activities and clinical trials.

Other Regulatory Designations

Orphan Drug and Orphan Medicinal Product Designations

The FDA has granted Orphan Drug designation for (i) our KL4 surfactant (lucinactant) for the treatment of RDS in premature infants, (ii) our KL4 surfactant for the prevention and treatment of BPD in premature infants, (iii) our KL4 surfactant for the treatment of acute respiratory distress syndrome, or ARDS, in adults, and (iv) our KL4 surfactant for the treatment of CF. See the section titled “– Government Regulation – Drug Products – Orphan Drugs.”

The European Commission, or EC, grants Orphan Medicinal Product designation for pharmaceutical products for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition affecting no more than 5 in 10,000 people which provides for exclusive marketing rights for indications in Europe for 10 years (subject to revision after six years) following marketing approval by the EMA. In addition, the designation would enable us to receive regulatory assistance in the further development process, and to access reduced regulatory fees throughout its marketing life. The EC has granted Orphan Medicinal Product designation for (i) our KL4 surfactant for the prevention of RDS in premature neonates of less than 32 weeks gestational age, (ii) our KL4 surfactant for the treatment of RDS in premature neonates of less than 37 weeks gestational age, (iii) our KL4 surfactant for the treatment of ALI (which in this circumstance encompasses ARDS), and (iv) our KL4 surfactant for the treatment of CF. In submitting the requests to the EMA for Orphan Medicinal Product designations, instead of listing the drug product under the USAN name (lucinactant) as we have in the U.S., we were required to submit our requests under the names of the four APIs in our KL4 surfactant (lucinactant) as follows: sinapultide (KL4), dipalmitoylphosphatidylcholine, palmitoyl-oleoyl phosphatidylglycerol and palmitic acid.

Fast Track Designations

The FDA has granted Fast Track designation for (i) SURFAXIN for the prevention and treatment of BPD in premature neonates and the treatment of ARDS in adults, (ii) AEROSURF for the treatment of RDS in premature neonates, and (iii) istaroxime for the treatment of AHF. We believe that other of our products may qualify for Fast Track or Breakthrough Therapy designation or other expedited programs. These designations and programs are intended to facilitate and expedite development and review of a New Drug Application, or NDA, to address unmet medical needs in the treatment of serious or life-threatening conditions. See the section titled "– Government Regulation – Drug Products – Fast Track Designation."

Competition

The biotechnology industry is a highly competitive industry. As we work to gain marketing authorization for our product candidates, competition from numerous existing pharmaceutical companies and other companies entering our fields is expected to be intense and expected to increase. In fact, our future competitors are competing with us currently to secure access to development resources, including clinical sites and their patients to advance development programs. We expect that those companies that are successful at being the first to introduce new products and technologies to the market may gain significant advantages over their competitors in the establishment of a customer base and track record for the performance of their products and technologies. Moreover, there are also existing therapies that may compete with the products we are developing. Therefore, as a development stage biotechnology company, our competitors are comprised of other biotechnology firms and pharmaceutical companies that have existing products or are developing products for our primary markets -- respiratory and cardiovascular indications.

NIH Funding

This prospectus includes information concerning our AEROSURF clinical and device development programs. The AEROSURF phase 2b clinical trial has been supported to date, in part, by a $2.6 million Phase IIb award under a Small Business Innovation Research, or SBIR, grant from the National Heart, Lung, and Blood Institute of the NIH, under parent award number R44HL107000. In addition, we received funding under a Phase II SBIR grant from the National Institute of Allergy and Infectious Diseases under parent grant number R44AI102308. The content of this prospectus is solely our responsibility and does not necessarily represent the official views of the NIH.

Government Regulation

In the U.S., drug products, medical devices, and drug/medical device combination products are subject to extensive regulation by the FDA. The Federal Food, Drug, and Cosmetic Act, or the FDC Act, and other federal and state statutes and regulations, govern, among other things, the research, development, testing, manufacture, storage, recordkeeping, approval, clearance, labeling, promotion, advertising and marketing, distribution, post-approval monitoring and reporting, sampling, and import and export of drug products, medical devices, and drug/medical device combination products. Failure to comply with applicable U.S. requirements may subject a company to a variety of administrative or judicial sanctions, such as FDA refusal to approve or clear pending new submissions to market drugs or devices warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties, and criminal prosecution. Drug products, medical devices, and drug/medical device combination products must receive all relevant regulatory approvals or clearances before they may be marketed in the U.S. Drug products, medical devices, and drug/medical device combination products are subject to extensive regulation, including premarket review and marketing authorization, by similar agencies in other countries.

Drug Products

Pharmaceutical product development for a new product or certain changes to an approved product in the U.S. typically involves preclinical laboratory and animal tests, the submission to the FDA of an investigational new drug application, or IND, which must become effective before clinical testing may commence, and adequate and well-controlled clinical trials to establish the safety and effectiveness of the drug for each indication for which the FDA approval is sought. Satisfaction of the FDA pre-market approval requirements typically takes many years and the actual time required may vary substantially based upon the type, complexity, and novelty of the product or disease.

Preclinical tests include laboratory evaluation of product chemistry, formulation, and toxicity, as well as animal trials to assess the characteristics and potential safety and efficacy of the product. The conduct of the preclinical tests must comply with federal regulations and requirements, including good laboratory practices. The results of preclinical testing are submitted to the FDA as part of an IND along with other information, including information about product chemistry, manufacturing and controls, and a proposed clinical trial protocol. Long-term preclinical tests, such as animal tests of reproductive toxicity and carcinogenicity, may continue after the IND is submitted.

A 30-day waiting period after the submission of each IND is required prior to the commencement of clinical testing in humans. If the FDA has neither commented on nor questioned the IND within this 30-day period, the clinical trial proposed in the IND may begin.

Clinical trials involve the administration of the investigational new drug to volunteers or patients under the supervision of a qualified investigator. Clinical trials must be conducted: (i) in compliance with federal regulations; (ii) in compliance with good clinical practice, or GCP, an international standard meant to protect the rights and health of patients and to define the roles of clinical trial sponsors, administrators, and monitors; as well as (iii) under protocols detailing the objectives of the trial, the parameters to be used in monitoring safety, and the effectiveness criteria to be evaluated. Each protocol involving testing on U.S. patients and subsequent protocol amendments must be submitted to the FDA as part of the IND.

The FDA may order the temporary, or permanent, discontinuation of a clinical trial at any time, or impose other sanctions, if it believes that the clinical trial either is not being conducted in accordance with the FDA requirements or presents an unacceptable risk to the clinical trial patients. The study protocol and informed consent information for patients in clinical trials must also be submitted to an institutional review board, or IRB, for approval. An IRB may also require the clinical trial at the site to be halted, either temporarily or permanently, for failure to comply with the IRB's requirements, or may impose other conditions.

Clinical trials to support NDAs for marketing approval are typically conducted in three sequential phases, but the phases may overlap. In phase 1, the initial introduction of the drug into human subjects or patients, the drug is tested to assess metabolism, pharmacokinetics, pharmacological actions, side effects associated with increasing doses, and, if possible, early evidence on effectiveness. phase 2 usually involves trials in a limited patient population to determine the effectiveness of the drug for a particular indication, dosage tolerance, and optimum dosage, and to identify common adverse effects and safety risks. If a compound demonstrates evidence of effectiveness and an acceptable safety profile in phase 2 evaluations, phase 3 trials are undertaken to obtain the additional information about clinical efficacy and safety in a larger number of patients, typically at geographically dispersed clinical trial sites, to permit the FDA to evaluate the overall benefit-risk relationship of the drug and to provide adequate information for the labeling of the drug. In most cases the FDA requires two adequate and well-controlled phase 3 clinical trials to demonstrate the efficacy of the drug. A single phase 3 trial with other confirmatory evidence may be sufficient in rare instances where the study is a large multicenter trial demonstrating internal consistency and a statistically very persuasive finding of a clinically meaningful effect on mortality, irreversible morbidity or prevention of a disease with a potentially serious outcome and confirmation of the result in a second trial would be practically or ethically impossible.

The manufacturer of an investigational drug in a phase 2 or 3 clinical trial for a serious or life-threatening disease is required to make available, such as by posting on its website, its policy on evaluating and responding to requests for expanded access to such investigational drug.

After completion of the required clinical testing, an NDA is prepared and submitted to the FDA. The FDA approval of the NDA is required before marketing of the product may begin in the U.S. The NDA must include the results of all preclinical, clinical, and other testing and a compilation of data relating to the product's pharmacology, chemistry, manufacture, and controls. The cost of preparing and submitting an NDA is substantial. The submission of most NDAs is additionally subject to a substantial application user fee, currently exceeding $2,942,000 for fiscal year 2020, and the applicant under an approved new drug application is also subject to an annual program fee, currently exceeding $325,000 per product for fiscal year 2020. These fees are typically increased annually.

The FDA has 60 days from its receipt of an NDA to determine whether the application will be filed based on the agency's threshold determination that it is sufficiently complete to permit substantive review. If the NDA submission is filed, the FDA reviews the NDA to determine, among other things, whether the proposed product is safe and effective for its intended use. The FDA has agreed to certain performance goals in the review of NDAs. Most such applications for standard review drug products are reviewed within ten to twelve months; most applications for priority review drugs are reviewed in six to eight months. Priority review can be applied to drugs that the FDA determines offer major advances in treatment or provide a treatment where no adequate therapy exists. The review process for both standard and priority review may be extended by the FDA for three additional months to consider certain late-submitted information, or information intended to clarify information already provided in the submission.

The FDA may also refer applications for novel drug products, or drug products that present difficult questions of safety or efficacy, to an advisory committee - typically a panel that includes clinicians and other experts - for review, evaluation, and a recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations. Before approving an NDA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP. Additionally, the FDA will inspect the facility or the facilities at which the drug is manufactured. The FDA will not approve the product unless compliance with current good manufacturing practices, or cGMPs, is satisfactory and the NDA contains data that provide substantial evidence that the drug is safe and effective in the indication studied.

After the FDA evaluates the NDA and the manufacturing facilities, it issues either an approval letter or a complete response letter. A complete response letter generally outlines the deficiencies in the submission and may require substantial additional testing, or information, in order for the FDA to reconsider the application. If, or when, those deficiencies have been addressed to the FDA's satisfaction in a resubmission of the NDA, the FDA will issue an approval letter. The FDA has committed to reviewing such resubmissions in two or six months depending on the type of information included.

An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. As a condition of NDA approval, the FDA may require a Risk Evaluation and Mitigation Strategy, or REMS, to help ensure that the benefits of the drug outweigh the potential risks. REMS can include medication guides, communication plans for healthcare professionals, and elements to assure safe use, or ETASU. ETASU can include, but are not limited to, special training or certification for prescribing or dispensing, dispensing only under certain circumstances, special monitoring, and the use of patient registries. The requirement for a REMS can materially affect the potential market and profitability of the drug. Moreover, product approval may require substantial post-approval testing and surveillance to monitor the drug's safety or efficacy. Once granted, product approvals may be withdrawn if compliance with regulatory standards is not maintained or problems are identified following initial marketing.

Changes to some of the conditions established in an approved application, including changes in indications, labeling, or manufacturing processes or facilities, require submission and the FDA approval of a new NDA or NDA supplement before the change can be implemented. An NDA supplement for a new indication typically requires clinical data similar to that in the original application, and the FDA uses the same procedures and actions in reviewing NDA supplements as it does in reviewing NDAs.

Orphan Drugs

Under the Orphan Drug Act, the FDA may grant Orphan Drug designation to drugs intended to treat a rare disease or condition – generally a disease or condition that affects fewer than 200,000 individuals in the U.S. Orphan drug designation must be requested before submitting an NDA. After the FDA grants Orphan Drug designation, the generic identity of the drug and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. The first NDA applicant to receive FDA approval for a particular active moiety to treat a particular disease with FDA Orphan Drug designation is entitled to a seven-year exclusive marketing period in the U.S. for that product, for that indication. During the seven-year exclusivity period, the FDA may not approve any other applications to market the same drug for the same disease, except in limited circumstances, such as a showing of clinical superiority to the product with Orphan Drug exclusivity by means of greater effectiveness, greater safety, or providing a major contribution to patient care. Orphan drug exclusivity does not prevent the FDA from approving a different drug for the same disease or condition, or the same drug for a different disease or condition. Among the other benefits of Orphan Drug designation are tax credits for certain research and a waiver of the NDA application user fee.

Fast Track Designation

The FDA is required to facilitate the development, and expedite the review, of drugs that are intended for the treatment of a serious or life-threatening disease and which demonstrate the potential to address unmet medical needs for the condition. Under the Fast Track program, the sponsor of a new drug candidate may request that the FDA designate the drug candidate for a specific indication as a Fast Track drug concurrent with, or after, the filing of the IND for the drug candidate. The FDA must determine if the drug candidate qualifies for Fast Track designation within 60 days of receipt of the sponsor's request.

Under the Fast Track program, sponsors have the opportunity to engage in more frequent interactions with the FDA. In addition, the FDA may initiate review of sections of a Fast Track drug's NDA before the application is complete. This rolling review is available if the applicant provides, and the FDA approves, a schedule for the submission of the remaining information and the applicant pays applicable user fees. However, the FDA's time period goal for reviewing an application does not begin until the last section of the NDA is submitted. Additionally, the Fast Track designation may be withdrawn by the FDA if the FDA believes that the designation is no longer supported by data emerging in the clinical trial process.

Breakthrough Therapy Designation

FDA is also required to expedite the development and review of the application for approval of drugs that are intended to treat a serious or life-threatening disease or condition where preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints. Under the breakthrough therapy program, the sponsor of a new drug candidate may request that FDA designate the drug candidate for a specific indication as a breakthrough therapy concurrent with, or after, the filing of the IND for the drug candidate. FDA must determine if the drug candidate qualifies for breakthrough therapy designation within 60 days of receipt of the sponsor's request.

The Hatch-Waxman Act

Orange Book Listing

In seeking approval for a drug through an NDA, applicants are required to list with the FDA each patent with claims covering the applicant's product or method of using the product. Upon approval of a drug, each of the patents listed in the application for the drug is then published in the FDA's Approved Drug Products with Therapeutic Equivalence Evaluations, commonly known as the Orange Book. Drugs listed in the Orange Book can, in turn, be cited by potential generic competitors in support of approval of an abbreviated new drug application, or ANDA. An ANDA provides for marketing of a drug product that has the same active ingredients in the same strengths and dosage form as the listed drug and has been shown to be bioequivalent to the listed drug. Other than the requirement for bioequivalence testing, ANDA applicants are not required to conduct, or submit results of, preclinical or clinical tests to prove the safety or effectiveness of their drug product. Drugs approved in this way are commonly referred to as generic equivalents to the listed drug, and can often be substituted by pharmacists under prescriptions written for the original listed drug.

The ANDA applicant is required to certify to the FDA concerning any patents listed for the approved product in the FDA's Orange Book. Specifically, the applicant must certify that: (i) the required patent information has not been filed; (ii) the 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 infringed by the new product. The ANDA applicant may also elect to submit a Section VIII statement certifying that its proposed ANDA labeling does not contain (or carves out) any language regarding the patented method-of-use rather than certify to a listed method-of-use patent. If the applicant does not challenge the listed patents, the ANDA application will not be approved until all the listed patents claiming the referenced product have expired.

A certification that the new product will not infringe the already approved product's listed patents, or that such patents are invalid, is called a Paragraph IV certification. If the ANDA applicant has provided a Paragraph IV certification to the FDA, the applicant must also send notice of the Paragraph IV certification to the NDA and patent holders once the ANDA has been received by the FDA. The NDA and patent holders may then initiate a patent infringement lawsuit in response to the notice of the Paragraph IV certification. The filing of a patent infringement lawsuit within 45 days of the receipt of a Paragraph IV certification automatically prevents the FDA from approving the ANDA until the earlier of 30 months, expiration of the patent, settlement of the lawsuit, or a decision in the infringement case that is favorable to the ANDA applicant.

An applicant submitting an NDA under Section 505(b)(2) of the FDC Act, which permits the filing of an NDA where at least some of the information required for approval comes from studies not conducted by, or for, the applicant and for which the applicant has not obtained a right of reference, is required to certify to the FDA regarding any patents listed in the Orange Book for the approved product it references to the same extent that an ANDA applicant would.

Market Exclusivity

Market exclusivity provisions under the FDC Act also can delay the submission or the approval of certain applications. The FDC Act provides a five-year period of non-patent exclusivity within the U.S. to the first applicant to gain approval of an NDA for a new chemical entity, or NCE. A drug is entitled to NCE exclusivity if it contains a drug substance no active moiety of which has been previously approved by the FDA. During the exclusivity period, the FDA may not receive for review an ANDA or file a 505(b)(2) NDA submitted by another company for another version of such drug where the applicant does not own or have a legal right of reference to all the data required for approval. However, an application may be submitted after four years if it contains a Paragraph IV certification. The FDC Act also provides three years of market exclusivity for an NDA, 505(b)(2) NDA or supplement to an existing NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application, for example, for new indications, dosages or strengths of an existing drug. This three-year exclusivity covers only the conditions for use associated with the new clinical investigations and does not prohibit the FDA from approving ANDAs for drugs for the original conditions of use, such as the originally approved indication. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA; however, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all the non-clinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

Patent Term Extension

After NDA approval, the owner of a relevant drug patent may apply for up to five years of patent term extension. Only one patent may be extended for each regulatory review period, which is composed of two parts: a testing phase, and an approval phase. The allowable patent term extension is calculated as half of the drug's testing phase - the time between the day the IND becomes effective and NDA submission – and all of the review phase – the time between NDA submission and approval – up to a maximum of five years. The time can be shortened if the FDA determines that the applicant did not pursue approval with due diligence. The total remaining patent term after the extension may not exceed 14 years.

For patents that might expire during the application phase, the patent owner may request an interim patent extension. An interim patent term extension increases the patent term by one year and may be renewed up to four times. For each interim patent term extension granted, the post-approval patent term extension is reduced by one year. The director of the United States Patent and Trademark Office, or USPTO, must determine that approval of the drug covered by the patent for which a patent extension is being sought is likely. Interim patent term extensions are not available for a drug for which an NDA has not been submitted.

Post-Approval Requirements

Once an NDA is approved, a product will be subject to certain post-approval requirements. For instance, the FDA closely regulates the post-approval marketing and promotion of drugs, including standards and regulations for direct-to-consumer advertising, off-label promotion, industry-sponsored scientific and educational activities and promotional activities involving the internet. Drugs may be marketed only for the approved indications and in accordance with the provisions of the approved labeling.

Adverse event reporting and submission of periodic reports is required following FDA approval of an NDA. The FDA also may require post-marketing testing, known as phase 4 testing, REMS, and surveillance to monitor the effects of an approved product, or the FDA may place conditions on an approval that could restrict the distribution or use of the product. In addition, quality-control, drug manufacture, packaging, and labeling procedures must continue to conform to cGMPs, after approval. Drug manufacturers and certain of their subcontractors are required to register their establishments with the FDA and certain state agencies. Registration with the FDA subjects entities to periodic unannounced inspections by the FDA, during which the agency inspects manufacturing facilities to assess compliance with cGMPs. Accordingly, manufacturers must continue to expend time, money, and effort in the areas of production and quality-control to maintain compliance with cGMPs. Regulatory authorities may withdraw product approvals or request product recalls if a company fails to comply with regulatory standards, if it encounters problems following initial marketing, or if previously unrecognized problems are subsequently discovered. In addition, prescription drug manufacturers in the U.S. must comply with applicable provisions of the Drug Supply Chain Security Act and provide and receive product tracing information, maintain appropriate licenses, ensure they only work with other properly licensed entities, and have procedures in place to identify and properly handle suspect and illegitimate products.

Pediatric Information

Under the Pediatric Research Equity Act, or PREA, NDAs or supplements to NDAs must contain data to assess the safety and effectiveness of the drug for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the drug is safe and effective. The FDA may grant full or partial waivers, or deferrals, for submission of data. Unless otherwise required by regulation, PREA does not apply to any drug for an indication for which orphan designation has been granted except a product with a new active ingredient that is a molecularly targeted cancer product intended for the treatment of an adult cancer and directed at a molecular target determined by the FDA to be substantially relevant to the growth or progression of a pediatric cancer that is subject to an NDA or BLA submitted on or after August 18, 2020.

The Best Pharmaceuticals for Children Act, or BPCA, provides NDA holders a six-month extension of any exclusivity—patent or non-patent—for a drug if certain conditions are met. Conditions for exclusivity include the FDA's determination that information relating to the use of a new drug in the pediatric population may produce health benefits in that population, the FDA making a written request for pediatric studies, and the applicant agreeing to perform, and reporting on, the requested studies within the statutory timeframe. Applications under the BPCA are treated as priority applications, with all of the benefits that designation confers.

Disclosure of Clinical Trial Information

Sponsors of clinical trials of FDA-regulated products are required to register and disclose certain clinical trial information. Information related to the product, patient population, phase of investigation, trial sites and investigators, and other aspects of the clinical trial is then made public as part of the registration. Sponsors are also obligated to discuss the results of their clinical trials after completion. Disclosure of the results of these trials can be delayed in certain circumstances for up to two years after the date of completion of the trial. Competitors may use this publicly available information to gain knowledge regarding the progress of development programs.

Regulation Outside the U.S.

In addition to regulations in the U.S., we are subject to a variety of regulations in other jurisdictions governing clinical studies, commercial sales, and distribution of our products. Most countries outside the U.S. require that clinical trial applications be submitted to and approved by the local regulatory authority for each clinical study. In addition, whether or not we obtain FDA approval for a product, we must obtain approval of a product by the comparable regulatory authorities of countries outside the U.S. before we can commence clinical studies or marketing of the product in those countries. The approval process varies from country to country, and the time may be longer or shorter than that required for FDA approval.

To obtain regulatory approval of an Orphan Drug under EU regulatory systems, we are mandated to submit marketing authorization applications, or MAAs, in centralized procedure. The centralized procedure, which came into operation in 1995, allows applicants to obtain a marketing authorization that is valid throughout the EU. It is compulsory for medicinal products manufactured using biotechnological processes, for orphan medicinal products and for human products containing a new active substance which was not authorized in the Community before May 20, 2004 (date of entry into force of Regulation (EC) No 726/2004) and which are intended for the treatment of AIDS, cancer, neurodegenerative disorder or diabetes. The centralized procedure is optional for any other products containing new active substances not authorized in the Community before May 20, 2004 or for products which constitute a significant therapeutic, scientific or technical innovation or for which a Community authorization is in the interests of patients at Community level. When a company wishes to place on the market a medicinal product that is eligible for the centralized procedure, it sends an application directly to the EMA, to be assessed by the Committee for Medicinal Products for Human Use, or CHMP. The procedure results in an EC decision, which is valid in all EU Member States. Centrally-authorized products may be marketed in all EU Member States.

In centralized procedure, full copies of the MAA are sent to a rapporteur and a co-rapporteur designated by the competent EMA scientific committee. They coordinate the EMA's assessment of the medicinal product and prepare draft reports. Once the draft reports are prepared (other experts might be called upon for this purpose), they are sent to the CHMP, whose comments or objections are communicated to the applicant. The rapporteur is therefore the privileged interlocutor of the applicant and continues to play this role, even after the MAA has been granted. The rapporteur and co-rapporteur then assess the applicant's replies, submit them for discussion to the CHMP and, taking into account the conclusions of this debate, prepare a final assessment report. Once the evaluation is completed, the CHMP gives a favorable or unfavorable opinion as to whether to grant the authorization. When the opinion is favorable, it shall include the draft summary of the product's characteristics, the package leaflet and the texts proposed for the various packaging materials. The time limit for the evaluation procedure is 210 days. The EMA then has fifteen days to forward its opinion to the EC. This is the start of the second phase of the procedure: the decision-making process.

The EMA sends to the EC its opinion and assessment report, together with annexes containing: the SmPC (Annex 1); the particulars of the Marketing Authorisation Holder, or MAH, responsible for batch release, the particulars of the manufacturer of the active substance and the conditions of the marketing authorization (Annex 2); and the labeling and the package leaflet (Annex 3). The annexes are translated into the 22 other official languages of the EU. During the decision-making process, the EC services verify that the marketing authorization complies with EU law. The EC has fifteen days to prepare a draft decision. The medicinal product is assigned a Community registration number, which will be placed on its packaging if the marketing authorization is granted. During this period, various EC directorates general are consulted on the draft marketing authorization decision. The draft decision is then sent to the Standing Committee on Medicinal Products for Human Use (EU Member States have one representative each in both of these committees) for their opinions.

The centralized procedure, which is compulsory for medicines produced by certain biotechnological processes and optional for those which are highly innovative, provides for the grant of a single marketing authorization that is valid for all EU member states. The decentralized procedure provides for approval by one or more other, or concerned, member states of an assessment of an application performed by one member state, known as the reference member state. Under this procedure, an applicant submits an application, or dossier, and related materials including a draft summary of product characteristics, and draft labeling and package leaflet, to the reference member state and concerned member states. The reference member state prepares a draft assessment and drafts of the related materials within 120 days after receipt of a valid application. Within 90 days of receiving the reference member state's assessment report, each concerned member state must decide whether to approve the assessment report and related materials. If a member state cannot approve the assessment report and related materials on the grounds of potential serious risk to the public health, the disputed points may eventually be referred to the EC, whose decision is binding on all member states.

Applications from persons or companies seeking "orphan medicinal product designation" for products they intend to develop for the diagnosis, prevention, or treatment of life-threatening or very serious conditions that affect not more than 5 in 10,000 persons in the EU are reviewed by the Committee for Orphan Medicinal Products. Or COMP. In addition, Orphan Drug designation can be granted if the drug is intended for a life threatening, seriously debilitating, or serious and chronic condition in the EU and that without incentives it is unlikely that sales of the drug in the EU would be sufficient to justify developing the drug. Orphan drug designation is only available if there is no other satisfactory method approved in the EU of diagnosing, preventing, or treating the condition, or if such a method exists, the proposed Orphan Drug will be of significant benefit to patients. Orphan drug designation provides opportunities for fee reductions for protocol assistance and access to the centralized regulatory procedures before and during the first year after marketing approval, which reductions are not limited to the first year after marketing approval for small and medium enterprises. In addition, if a product which has an Orphan Drug designation subsequently receives EMA marketing approval for the indication for which it has such designation, the product is entitled to Orphan Drug exclusivity, which means the EMA may not approve any other application to market the same drug for the same indication for a period of 10 years. The exclusivity period may be reduced to six years if the designation criteria are no longer met, including where it is shown that the product is sufficiently profitable not to justify maintenance of market exclusivity. Competitors may receive marketing approval of different drugs or biologics for the indications for which the orphan product has exclusivity. In order to do so, however, they must demonstrate that the new drugs or biologics provide a significant benefit over the existing orphan product. This demonstration of significant benefit may be done at the time of initial approval or in post-approval studies, depending on the type of marketing authorization granted.

A pediatric investigation plan, or PIP, is a development plan aimed at ensuring that the necessary data are obtained to support the authorization of a medicine for children, through studies in children. All applications for marketing authorization for new medicines have to include the results of studies as described in an agreed PIP, unless the medicine is exempt because of a deferral or waiver. This requirement also applies when a marketing-authorization holder wants to add a new indication, pharmaceutical form, or route of administration for a medicine that is already authorized and covered by intellectual property rights. Several rewards and incentives for the development of pediatric medicines for children are available in the EU. Medicines authorized across the EU with the results of studies from a PIP included in the product information are eligible for an extension of their supplementary protection certificate by six months. This is the case even when the studies' results are negative. For orphan medicines, the incentive is an additional two years of market exclusivity. Scientific advice and protocol assistance at the EMA are free of charge for questions relating to the development of pediatric medicines. Medicines developed specifically for children that are already authorized but are not protected by a patent or supplementary protection certificate are eligible for a pediatric-use marketing authorization, or PUMA. If a PUMA is granted, the product will benefit from 10 years of market protection as an incentive.

In a referendum held in the United Kingdom, or UK, on June 23, 2016, a majority of those voting voted for the UK to leave the EU, commonly referred to as "Brexit". The effective date of the UK's withdrawal from the EU will be January 31, 2020. The ultimate impact of the "leave" vote will depend on the terms that are negotiated in relation to the UK's future relationship with the EU. Brexit could lead to legal uncertainty and potentially divergent national laws and regulations as the UK determines which EU laws to replicate or replace.

Medical Device Products

A medical device is an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent, or other similar or related article, including any component part, or accessory which is: (i) recognized in the official National Formulary, or the US Pharmacopoeia, or any supplement to them; (ii) intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of disease, in man or other animals; or (iii) intended to affect the structure or any function of the body of man or other animals, and which does not achieve any of its primary intended purposes through chemical action within or on the body of man or other animals and which is not dependent upon being metabolized for the achievement of any of its primary intended purposes.

The FDC Act classifies medical devices into one of three categories based on the risks associated with the device and the level of control necessary to provide reasonable assurance of safety and effectiveness. Class I devices are deemed to be low risk and are subject to the fewest regulatory controls. Class III devices are generally the highest risk devices and are subject to the highest level of regulatory control to provide reasonable assurance of the device's safety and effectiveness. Class III devices must typically be approved by the FDA before they are marketed.

Generally, establishments that manufacture and/or distribute devices, including manufacturers, contract manufacturers, sterilizers, repackagers and relabelers, specification developers, reprocessors of single-use devices, remanufacturers, initial importers, manufacturers of accessories and components sold directly to the end user, and U.S. manufacturers of export-only devices, are required to register their establishments with the FDA and provide the FDA a list of the devices that they handle at their facilities.

Pre-market Authorization and Notification

While most Class I and some Class II devices can be marketed without prior FDA authorization, most medical devices can be legally sold within the U.S. only if the FDA has: (i) approved a premarket approval application, or PMA, prior to marketing, generally applicable to Class III devices; or (ii) cleared the device in response to a premarket notification, or 510(k) submission, generally applicable to Class I and II devices. Some devices that have been classified as Class III are regulated pursuant to the 510(k) requirements because the FDA has not yet called for PMAs for these devices. Other less common regulatory pathways to market for certain devices include the de novo classification process, the humanitarian device exception, or HDE, or a product development protocol, or PDP.

The 510(k) Clearance Process

Under the 510(k) process, the manufacturer must submit to the FDA a premarket notification, demonstrating that the device is "substantially equivalent," as defined in the statute, to a legally marketed predicate device.

A predicate device is a legally marketed device that is not subject to premarket approval, i.e., a device that was legally marketed prior to May 28, 1976, often referred to as a preamendments device, and for which a PMA is not required, a device that has been reclassified from Class III to Class II or I, or a device that was previously found substantially equivalent through the 510(k) process. To be "substantially equivalent," the proposed device must have the same intended use as the predicate device, and either have the same technological characteristics as the predicate device or have different technological characteristics and not raise different questions of safety or effectiveness than the predicate device. Clinical data is sometimes required to support substantial equivalence.

After a 510(k) premarket notification is submitted, the FDA determines whether to accept it for substantive review. If it lacks necessary information for substantive review, the FDA will refuse to accept the 510(k) notification. If it is accepted for filing, the FDA begins a substantive review. By statute, the FDA has a performance goal to complete its review of 95% of 510(k) submissions within 90 days of receipt. As a practical matter, clearance often takes longer, because the FDA can request additional date and information, which pauses the review clock for up to 180 days, and clearance is never assured. Although many 510(k) premarket notifications are cleared without clinical data, the FDA may require further information, including clinical data, to make a determination regarding substantial equivalence. If the FDA agrees that the device is substantially equivalent, it will grant clearance to commercially market the device.

If the FDA determines that the device is not "substantially equivalent" to a predicate device, or if the device is automatically classified into Class III, the device sponsor must then fulfill the much more rigorous premarketing requirements of the PMA approval process, or seek reclassification of the device through the de novo process. A manufacturer can also submit a petition for direct de novo review if the manufacturer is unable to identify an appropriate predicate device and the new device or new use of the device presents a moderate or low risk.

After a device receives 510(k) clearance, any modification that could significantly affect its safety or effectiveness, or that would constitute a new or major change in its intended use, will require a new 510(k) clearance or, depending on the modification, could require a PMA application or de novo classification. The FDA requires each manufacturer to determine whether the proposed change requires submission of a 510(k) or a PMA in the first instance, but the FDA can review any such decision and disagree with a manufacturer's determination. Many minor modifications are accomplished by a letter-to-file in which the manufacturer documents the change in an internal letter-to-file. The letter-to-file is in lieu of submitting a new 510(k) to obtain clearance for such change. The FDA can always review these letters to file in an inspection. If the FDA disagrees with a manufacturer's determination regarding whether a new premarket submission is required for the modification of an existing device, the FDA can require the manufacturer to cease marketing and/or recall the modified device until 510(k) clearance or approval of a PMA application is obtained. In addition, in these circumstances, the FDA can impose significant regulatory fines or penalties for failure to submit the requisite PMA application(s).

The PMA Approval Process

Following receipt of a PMA application, the FDA conducts an administrative review to determine whether the application is sufficiently complete to permit a substantive review. If it is not, the agency will refuse to file the PMA. If it is, the FDA will accept the application for filing and begin the review. The FDA, by statute and by regulation, has a performance goal to review 90% of PMA applications within 180 days, if advisory committee input is not required, and within 320 days, if advisory committee input is required, although the review of an application more often occurs over a significantly longer period of time. During this review period, the FDA may request additional information or clarification of information already provided, and the FDA may issue a major deficiency letter to the applicant, requesting the applicant's response to deficiencies communicated by the FDA. The FDA considers a PMA or PMA supplement to have been voluntarily withdrawn if an applicant fails to respond to an FDA request for information (e.g., major deficiency letter) within a total of 360 days. Before approving or denying a PMA, an FDA advisory committee may review the PMA at a public meeting and provide the FDA with the committee's recommendation on whether the FDA should approve the submission, approve it with specific conditions, or not approve it. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Prior to approval of a PMA, the FDA may conduct inspections of the clinical trial data and clinical trial sites, as well as inspections of the manufacturing facility and processes. Overall, the FDA review of a PMA application generally takes between one and three years, but may take significantly longer. The FDA can delay, limit or deny approval of a PMA application for many reasons, including:

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

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

New PMA applications or PMA supplements are required for modification to the manufacturing process, equipment or facility, quality control procedures, sterilization, packaging, expiration date, labeling, device specifications, ingredients, materials or design of a device that has been approved through the PMA process. PMA supplements often require submission of the same type of information as an initial PMA application, except that the supplement is limited to information needed to support any changes from the device covered by the approved PMA application and may or may not require as extensive technical or clinical data or the convening of an advisory panel, depending on the nature of the proposed change. In approving a PMA application, as a condition of approval, the FDA may also require some form of post-approval study or post-market surveillance, whereby the applicant conducts a follow-up study or follows certain patient groups for a number of years and makes periodic reports to the FDA on the clinical status of those patients when necessary to protect the public health or to provide additional or longer term safety and effectiveness data for the device. The FDA may also require post-market surveillance for certain devices cleared under a 510(k) notification, such as implants or life-supporting or life-sustaining devices used outside a device user facility. The FDA may also approve a PMA application with other post-approval conditions intended to ensure the safety and effectiveness of the device, such as, among other things, restrictions on labeling, promotion, sale, distribution and use.

Exempt Devices

If a manufacturer's device falls into a generic category of Class I or Class II devices that the FDA has exempted by regulation, a premarket notification is not required before marketing the device in the U.S. Manufacturers of such devices are required to register their establishments and list the proprietary device name and the generic category or classification regulation into which the device fits. Some 510(k)-exempt devices are also exempt from Quality System Regulation, or QSR, requirements.

Post-market Requirements

After a device is placed on the market, numerous regulatory requirements apply. These include: the QSR, labeling regulations, the FDA’s general prohibition against promoting products for unapproved or off-label uses, the Medical Device Reporting regulation (which requires that manufacturers report to the FDA if their device may have caused or contributed to a death or serious injury or malfunctioned in a way that would likely cause or contribute to a death or serious injury if it were to recur), and the Reports of Corrections and Removals regulation (which requires manufacturers to report recalls and field actions to the FDA if initiated to reduce a risk to health posed by the device or to remedy a violation of the FDC Act).

The FDA enforces these requirements by inspection and market surveillance. If the FDA finds a violation, it can institute a wide variety of enforcement actions, ranging from a public warning letter to more severe sanctions such as: fines, injunctions, and civil penalties; recall or seizure of products; operating restrictions, partial suspension or total shutdown of production; refusing requests for 510(k) clearance or PMA approval of new products; withdrawing 510(k) clearance or PMA approvals already granted; and criminal prosecution.

Combination Products

A combination product is a product comprised of (i) two or more regulated components, i.e., drug/medical device, biologic/medical device, drug/biologic, or drug/medical device/biologic, that are physically, chemically, or otherwise combined or mixed and produced as a single entity; (ii) two or more separate products packaged together in a single package or as a unit and comprised of drug and device products, device and biological products, or biological and drug products; (iii) a drug, device, or biological product packaged separately that according to its investigational plan or proposed labeling is intended for use only with an approved individually specified drug, device, or biological product where both are required to achieve the intended use, indication, or effect and where, upon approval of the proposed product, the labeling of the approved product would need to be changed, e.g., to reflect a change in intended use, dosage form, strength, route of administration, or significant change in dose; or (iv) any investigational drug, device, or biological product packaged separately that according to its proposed labeling is for use only with another individually specified investigational drug, device, or biological product where both are required to achieve the intended use, indication, or effect.

The FDA is divided into various branches, or Centers, by product type. Different Centers typically review drug, biologic, or device applications. In order to review an application for a combination product, the FDA must decide which Center should be responsible for the review. FDA regulations require that the FDA determine the combination product's primary mode of action, or PMOA, which is the single mode of a combination product that provides the most important therapeutic action of the combination product. The Center that regulates that portion of the product that generates the PMOA becomes the lead evaluator. If there are two independent modes of action, neither of which is subordinate to the other, the FDA makes a determination as to which Center to assign the product based on consistency with other combination products raising similar types of safety and effectiveness questions or to the Center with the most expertise in evaluating the most significant safety and effectiveness questions raised by the combination product. When evaluating an application, a lead Center may consult other Centers but still retain complete reviewing authority, or it may collaborate with another Center, by which the Center assigns review of a specific section of the application to another Center, delegating its review authority for that section. Typically, the FDA requires a single marketing application submitted to the Center selected to be the lead evaluator, although the agency has the discretion to require separate applications to more than one Center. One reason to submit multiple evaluations is if the applicant wishes to receive some benefit that accrues only from approval under a particular type of application, like new drug product exclusivity. If multiple applications are submitted, each may be evaluated by a different lead Center.

International Approvals

Drug products, medical devices, and drug/medical device combination products are subject to extensive regulation, including premarket review and marketing authorization, by similar agencies in other countries. Regulatory requirements and approval processes are similar in approach to that of the U.S. but are not harmonized. International regulators are independent and not bound by the findings of the FDA and there is a risk that foreign regulators will not accept clinical trial design/results or may require additional data or other information not requested by the FDA. In addition, international regulators may require different manufacturing practices than the FDA's cGMPs.

The EU consists of member states residing in the EU and has a coordinated system for the authorization of medical devices. The European Union Medical Devices Directive, or MDD, sets out the basic regulatory framework for medical devices in the EU. This directive has been separately enacted in more detail in the national legislation of the individual member states of the EU.

The system of regulating medical devices operates by way of a certification for each medical device. Each certificated device is marked with CE mark which shows that the device has a Certificat de Conformité. There are national bodies known as Competent Authorities in each member state which oversee the implementation of the MDD within their jurisdiction. The means for achieving the requirements for CE mark varies according to the nature of the device. Devices are classified in accordance with their perceived risks, similarly to the U.S. system. The class of a product determines the requirements to be fulfilled before CE mark can be placed on a product, known as a conformity assessment. Conformity assessments for our products are carried out as required by the MDD. Each member state can appoint Notified Bodies within its jurisdiction. If a Notified Body of one member state has issued a Certificat de Conformité, the device can be sold throughout the EU without further conformance tests being required in other member states.

Reimbursement

Potential sales of any of our product candidates, if approved, will depend, at least in part, on the extent to which such products will be covered by third-party payors, such as government health care programs, commercial insurance and managed healthcare organizations. These third-party payors are increasingly limiting coverage and/or reducing reimbursements for medical products and services. A third-party payor's decision to provide coverage for a drug product does not imply that an adequate reimbursement rate will be approved. Further, one payor's determination to provide coverage for a drug product does not assure that other payors will also provide coverage for the drug product. In addition, the U.S. government, state legislatures and foreign governments have continued implementing cost-containment programs, including price controls, restrictions on reimbursement and requirements for substitution of generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit our future revenues and results of operations. Decreases in third-party reimbursement or a decision by a third-party payor to not cover a product candidate, if approved, or any future approved products could reduce physician usage of our products, and have a material adverse effect on our sales, results of operations and financial condition.

In the U.S., the Medicare Part D program provides a voluntary outpatient drug benefit to Medicare beneficiaries for certain products. We do not know whether our product candidates, if approved, will be eligible for coverage under Medicare Part D, but individual Medicare Part D plans offer coverage subject to various factors such as those described above. Furthermore, private payors often follow Medicare coverage policies and payment limitations in setting their own coverage policies.

Anti-Kickback, False Claims Laws and Other Regulations

In addition to the FDA restrictions on marketing of pharmaceutical products, medical devices, and combination products, several other types of state and federal laws have been applied to restrict certain marketing practices in the medical product industry in recent years. These laws include anti-kickback statutes, false claims statutes, and other statutes pertaining to health care fraud and abuse. The federal healthcare program anti-kickback statute prohibits, among other things, knowingly and willfully offering, paying, soliciting or receiving remuneration to induce, or in return for, purchasing, leasing, ordering or arranging for the purchase, lease or order of any healthcare item or service reimbursable under Medicare, Medicaid, or other federally financed healthcare programs. The Patient Protection and Affordable Care Act, or PPACA, amended the intent element of the federal statute so that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it. This statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers, and formulary managers on the other. Violations of the anti-kickback statute are punishable by imprisonment, criminal fines, civil monetary penalties, and exclusion from participation in federal healthcare programs. Although there are a number of statutory exemptions and regulatory safe harbors protecting certain common activities from prosecution or other regulatory sanctions, the exemptions and safe harbors are drawn narrowly, and practices that involve remuneration intended to induce prescribing, purchases, or recommendations may be subject to scrutiny if they do not qualify for an exemption or safe harbor.

Federal false claims laws prohibit any person from knowingly presenting, or causing to be presented, a false claim for payment to the federal government, or knowingly making, or causing to be made, a false statement to have a false claim paid. This includes claims made to programs where the federal government reimburses, such as Medicaid, as well as programs where the federal government is a direct purchaser, such as when it purchases off the Federal Supply Schedule. Recently, several pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly inflating drug prices they report to pricing services, which in turn were used by the government to set Medicare and Medicaid reimbursement rates, and for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. In addition, certain marketing practices, including off-label promotion, may also violate false claims laws. Additionally, PPACA amended the healthcare program anti-kickback statute such that a violation can serve as a basis for liability under the federal false claims law. The majority of states also have statutes or regulations similar to the federal anti-kickback law and false claims laws, which apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor.

The U.S. federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, created additional federal criminal statutes that prohibit among other actions, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third-party payors or making any false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their implementing regulations, impose obligations on certain types of individuals and entities regarding the electronic exchange of information in common healthcare transactions, as well as standards relating to the privacy and security of individually identifiable health information.

Other federal statutes pertaining to healthcare fraud and abuse include the civil monetary penalties statute, which prohibits the offer or payment of remuneration to a Medicaid or Medicare beneficiary that the offeror/payor knows or should know is likely to influence the beneficiary to order a receive a reimbursable item or service from a particular supplier, and the healthcare fraud statute, which prohibits knowingly and willfully executing or attempting to execute a scheme to defraud any healthcare benefit program or obtain by means of false or fraudulent pretenses, representations, or promises any money or property owned by or under the control of any healthcare benefit program in connection with the delivery of or payment for healthcare benefits, items, or services.

Additionally, to the extent that our product is sold in a foreign country, we may be subject to similar foreign laws.

Privacy and Security laws

HIPAA, as amended by HITECH, and their respective implementing regulations, impose privacy, security transmission and breach reporting obligations with respect to individually identifiable health information, including protected health information, or PHI, upon entities subject to the law, such as health plans, healthcare clearinghouses and certain healthcare providers, and their respective business associates that perform services on their behalf that involve individually identifiable health information, including PHI. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions. Although we are not directly subject to HIPAA, other than potentially with respect to providing certain employee benefits, we could be subject to criminal penalties if we knowingly obtain or disclose individually identifiable health information maintained by a HIPAA covered entity in a manner that is not authorized or permitted by HIPAA.

Federal and state laws that govern the privacy and security of health information or personally identifiable information in certain circumstances, including state health information privacy and data breach notification laws which govern the collection, use, disclosure, and protection of health-related and other personal information, many of which differ from each other in significant ways, and data privacy and security laws and regulations in foreign jurisdictions that may be more stringent than those in the U.S. (such as the General Data Protection Regulation in the European Union), may require the Company undertake compliance efforts that could be costly and time consuming or subject us to liability for a failure to comply.

Other Federal and State Regulatory Requirements

Manufacturers of prescription drugs are required to collect and report information on certain payments or transfers of value to physicians and teaching hospitals, as well as investment interests held by physicians and their immediate family members. The reports must be submitted on an annual basis and the reported data are posted in searchable form on a public website on an annual basis. Failure to submit required information may result in civil monetary penalties. Effective January 1, 2022, transfers of value to physician assistants, nurse practitioners or clinical nurse specialists, certified registered nurse anesthetists, and certified nurse-midwives will also be required.

In addition, several states now require prescription drug companies to report certain expenses relating to the marketing and promotion of drug products and to report gifts and payments to individual healthcare practitioners in these states. Other states prohibit various marketing-related activities, such as the provision of certain kinds of gifts or meals. Still other states require the posting of information relating to clinical studies and their outcomes. Some states require the reporting of certain pricing information, including information pertaining to and justifying price increases, or prohibit prescription drug price gouging. In addition, states such as California, Connecticut, Nevada, Massachusetts require pharmaceutical companies to implement compliance programs and/or marketing codes. Additional jurisdictions, such as the City of Chicago and the District of Columbia, require pharmaceutical sales representatives to be licensed and meet continuing education requirements. Several additional states are considering similar proposals. Compliance with these laws is difficult and time-consuming, and companies that do not comply with these state laws face civil penalties.

U.S. Healthcare Reform

Changes in healthcare policy could increase our costs and subject us to additional regulatory requirements. By way of example, PPACA substantially changed the way healthcare is financed by both governmental and private insurers, and significantly impacted the medical device industry. There will continue to be proposals by legislators at both the federal and state levels, regulators and third-party payors to reduce costs while expanding individual healthcare benefits. Certain of these changes could impose additional limitations on the prices we will be able to charge and/or patients' willingness to pay for our products. While in general it is too early to predict what effect, if any, PPACA and its implementation, or any future healthcare reform legislation or policies will have on our business, current and future healthcare reform legislation and policies could have a material adverse effect on our business and financial condition.

Foreign Corrupt Practices Act

The Foreign Corrupt Practices Act, or FCPA, prohibits U.S. businesses and their representatives from offering to pay, paying, promising to pay or authorizing the payment of money or anything of value to a foreign official in order to influence any act or decision of the foreign official in his or her official capacity or to secure any other improper advantage in order to obtain or retain business. The FCPA also obligates companies whose securities are listed in the U.S. to comply with accounting provisions requiring us to maintain books and records, which in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the corporation, including international subsidiaries, if any, and to devise and maintain a system of internal accounting controls sufficient to provide reasonable assurances regarding the reliability of financial reporting and the preparation of financial statements. The scope of the FCPA includes interactions with certain healthcare professionals in many countries.

International laws

In Europe, and throughout the world, other countries have enacted anti-bribery laws and/or regulations similar to the FCPA. Violations of any of these antibribery laws, or allegations of such violations, could have a negative impact on our business, results of operations and reputation. There are also international privacy laws that impose restrictions on the access, use, and disclosure of health information. All of these laws may impact our business. Our failure to comply with these privacy laws or significant changes in the laws restricting our ability to obtain required patient information could significantly impact our business and our future business plans.

CVie Acquisition

In December 2018 we acquired CVie Investments Limited, or CVie Investments, an exempted company with limited liability incorporated under the laws of the Cayman Islands, which we refer to herein as the CVie Acquisition. Since the CVie Acquisition, we have operated CVie Investments, and its wholly-owned subsidiary, CVie Therapeutics, a Taiwan corporation organized under the laws of China, as a business focused on early development of drug product candidates for cardiovascular diseases. We undertook the merger as part of a strategic initiative to create stockholder value that resulted from a multi-year process focused on identifying strategic opportunities, including potential strategic alliances, collaborations (primarily outside the U.S.), joint development opportunities, acquisitions, technology licensing arrangements, as well as potential combinations (including by merger or acquisition) or other corporate transactions.

Employees

As of December 31, 2019, we have 33 employees, including 32 full-time employees.

Properties

We maintain our principal executive offices at 2600 Kelly Road, Suite 100, Warrington, Pennsylvania 18976-3622. Our premises include corporate administration, research and drug and device development, clinical operations, regulatory affairs, and quality, as well as our analytical and technical support laboratory, which conducts release testing of APIs and supportive research for our lyophilized and aerosolized KL4 surfactant. We also maintain a medical device development laboratory that is used by our engineering team to conduct development activities for AEROSURF and our aerosol delivery technologies. In February 2018, we reduced the size of our premises from 30,506 square feet to 21,189 square feet of leased space, which lowered our base rent and security deposit under the related lease agreement. We also maintain a location in Taipei, Taiwan, the former headquarters of CVie Therapeutics, consisting of approximately 2,200 square feet of office space, where we perform certain manufacturing development and preclinical activities related to our cardiovascular drug product candidates. We also have access to research laboratories in Milan, Italy under our collaboration agreement with Università degli Studi di Milano-Bicocca. We believe our current facilities are adequate for our needs in 2020.

Legal Proceedings

We are not aware of any pending legal actions that would, if determined adversely to us, have a material adverse effect on our business and operations.

We may be subject to other legal proceedings and claims in the ordinary course of business. We cannot predict the results of any such disputes, and despite the potential outcomes, the existence thereof may have an adverse material impact on us due to diversion of management time and attention as well as the financial costs related to resolving such disputes.

Available Information

We file annual, quarterly and current reports, proxy or stockholder information statements and other information with the Securities and Exchange Commission, or the SEC. The SEC maintains an Internet site that contains reports, proxy and information statements, certain and other information that we may file electronically with the SEC (http://www.sec.gov). We maintain our corporate website at http://www.windtreetx.com. Our website and the information contained therein or connected thereto are not incorporated into this prospectus.

MANAGEMENT

The following table sets forth information regarding our executive officers and directors, including their ages as of January 1, 2020:

NAME	AGE	POSITION(S)
Executive Officers		
Craig Fraser	55	President and Chief Executive Officer, Director
Steven G. Simonson, M.D.	61	Senior Vice President and Chief Medical Officer
John A. Tattory	54	Senior Vice President and Chief Financial Officer
Mary B. Templeton, Esq.	73	Senior Vice President, General Counsel and Corporate Secretary
Non-Employee Directors		
James Huang	54	Chairman of the Board of Directors
John R. Leone	72	Director
Joseph M. Mahady	66	Director
Bruce A. Peacock	68	Director
Brian D. Schreiber, M.D.	66	Director
Daniel E. Geffken	62	Director

Executive Officers

Craig Fraser. Mr. Fraser has served as President and Chief Executive Officer and a member of the Board of Directors, or the Board, since February 1, 2016. He brings over 29 years of experience as a leader in product development, fundraising, business development and commercial operations in building biopharmaceutical and device businesses for startups as well as larger companies. Prior to joining us, Mr. Fraser held executive positions at several biopharmaceutical companies, including Novelion as Chief Operating Officer and President from 2014 to 2015 and, prior to that, positions of increasing responsibility; as Vice President of Global Disease Areas at Pfizer from 2009 to 2011 and Vice President and Global Business Manager at Wyeth Pharmaceuticals from 2007 to 2009. Previously, Mr. Fraser served as Vice President, Sales & Marketing and Commercial Operations and as Vice President, Global Strategic Marketing at Johnson & Johnson; and as Gastroenterology Franchise Lead, National Sales Director – Immunology and Acute Cardiovasculars, and Marketing Director – Cardiovasculars and Diagnostics at Centocor and various sales and sales management positions prior to marketing roles. Mr. Fraser is a veteran of both the U.S. Marine Corps and the U.S. Army. Mr. Fraser does not serve on any other public company boards. Mr. Fraser received his B.S. degree in Public Administration from Slippery Rock University of Pennsylvania.

Mr. Fraser's knowledge of our business, as well as his extensive leadership and biopharmaceutical industry experience provide him with the qualifications and skills to serve on our Board.

Steven G. Simonson. Mr. Simonson has served as our Senior Vice President and Chief Medical Officer since April 2017, having previously served as our Senior Vice President and Chief Development Officer from October 2014 to April 2017, and our Vice President, Clinical Development, upon joining the Company in May of 2014. Dr. Simonson brings to us over 25 years of medical practice and pharmaceutical industry clinical trial experience with a significant background in pulmonary critical care and developing respiratory drugs, including preclinical, first time into man and phases 1-4, and IND, NDA and sNDA experience. Dr. Simonson spent 15 years at AstraZeneca Pharmaceuticals in areas of medical and clinical leadership primarily in the pulmonary and infection therapeutic areas. He has been involved in or led several successful IND and NDA filings including the Pulmicort® Turbuhaler® M3 NDA, which was approved for treatment of asthma. He spent the next two years as Vice President of Clinical Development at Agennix, Inc., a biopharmaceutical company primarily focused in oncology and sepsis, leading programs including studies of talactoferrin in necrotizing enterocolitis, the second most common cause of morbidity in premature neonates. Most recently, Dr. Simonson was an Executive Director in the Molecule Development Group at Covance, a biopharmaceutical development services company, where he applied his experience to developing clinical development programs for small and mid-size biotech and pharmaceutical companies. Dr. Simonson completed training in internal medicine followed by a fellowship in pulmonary and critical care medicine at Duke University Medical Center. He then held several faculty appointments at Duke in the departments of Anesthesiology and Medicine, including the divisions of Pulmonary and Critical Care Medicine. He is a Fellow of the American College of Chest Physicians, and author or co-author of multiple peer reviewed publications, abstracts, posters and chapters. Dr. Simonson received his medical degree from the Medical College of Wisconsin, and his Master of Health Sciences degree in Biometry from the Duke University School of Medicine.

John A. Tattory. Mr. Tattory has served as our Senior Vice President and Chief Financial Officer in March 2014, having previously served as our Vice President, Finance and Chief Accounting Officer from March 2013 to March 2014, and our Vice President, Finance, and Controller and the designated principal accounting officer from July 2010 to March 2013, and Vice President, Finance from January 2008 to July 2010. He brings more than 25 years of financial management and leadership experience, including directing U.S. and international financial operations, strategic transactions, licensing and collaboration arrangements, and equity and debt financings. Prior to joining us, Mr. Tattory held financial management positions at Tyco International, where he served as Director, Financial Planning & Analysis for Tyco Flow Control, an operating unit that included the majority of business operations in international markets; and Bristol-Myers Squibb, or BMS, where he held financial roles of increasing responsibility, most recently as Finance Director, U.S. Primary Care, with responsibility for the financial matters of various BMS pharmaceutical businesses, including international operations. Previously, Mr. Tattory served as an Audit Manager with Ernst & Young LLP. Mr. Tattory is a certified public accountant and holds a B.S. degree in Commerce from Rider University.

Mary B. Templeton, Esq. Ms. Templeton has served as Senior Vice President, General Counsel and Corporate Secretary since September 2011, having previously served as Senior Vice President and Deputy General Counsel since joining us in March 2006. Ms. Templeton brings to us 40 years of legal and executive experience. Ms. Templeton previously held senior executive positions in the financial services industry, including as Senior Vice President and General Counsel of The Charles Schwab Corporation and as Senior Vice President and General Counsel of The Sequor Group Inc. (owned by Security Pacific Corporation) and in private practice in Philadelphia and New York. Prior to that, at Charles Schwab & Co., Ms. Templeton led development of the first broker-operated mutual fund marketplace, and, at Bradford Trust Company (New York), the first for-profit clearing corporation registered with the SEC. Ms. Templeton received a B.A. degree from Chatham University, where she is a member of the Board of Trustees, and a J.D. with High Honors from Rutgers Law School, Camden, NJ, where she served as Editor-in-Chief of the Law Journal. She is a member of the Bar Associations of Pennsylvania and New York.

Non-Employee Directors

James Huang. Mr. Huang was elected as Chairman of the Board on December 21, 2018. Mr. Huang is a founding and Managing Partner to Panacea Venture. Panacea Venture is a venture capital firm that invests in early and growth stage healthcare and life sciences companies worldwide. Since 2011, Mr. Huang has served as a Managing Partner of Kleiner Perkins Caufield & Byers, or KPCB – China, an investment advisory firm, focusing on the firm's life sciences practice. Mr. Huang has made more than 15 investments in China since 2007. Prior to joining KPCB China, Mr. Huang was a Managing Partner at Vivo Ventures, a venture capital firm specializing in life sciences investments. Prior to joining Vivo in 2007, Mr. Huang was president of Anesiva, a biopharmaceutical company focused on pain-management treatments. During his 20-year career in the pharmaceutical and biotech industry, Mr. Huang also held senior roles in business development, sales, marketing and R&D with Tularik Inc. (subsequently acquired by Amgen), GlaxoSmithKline LLC, Bristol-Myers Squibb and ALZA Corp. (subsequently acquired by Johnson & Johnson). Mr. Huang is Chairman of Board at Kindstar Global, JHL Biotech and XW Laboratory and Director at ChiralQuest, Zenesis, and CASI Pharmaceuticals. Mr. Huang received an M.B.A. from the Stanford Graduate School of Business in 1992 and a B.S. degree in chemical engineering from the University of California, Berkeley.

Mr. Huang's insight into life sciences financing and experience in the biopharmaceutical industry provide him with the qualifications and skills to serve on our Board.

John R. Leone. Mr. Leone has served as a member of our Board since November 2012, acting as Chairman from January 2013 through December 20, 2018. He currently serves as Chairman of the Board's nominating and governance committee and as a member of the audit committee. Mr. Leone has over 30 years of experience in pharmaceutical operations, commercial portfolio management, and financing life science companies. His commercial experience includes significant domestic and international executive management roles and direct responsibility for the commercial launch of numerous pharmaceutical products. Since January 2017, Mr. Leone has served as an Operating Partner at Madryn Asset Management, an investment platform focused on providing capital to healthcare companies. Madryn Asset Management was spun out from Visium Asset Management, or Visium, where Mr. Leone was a Partner from May 2013 to January 2017. Prior to joining Visium, Mr. Leone was a Partner from 2007 to 2013 at Paul Capital Healthcare, a private equity firm that manages one of the largest dedicated healthcare funds globally. Previously, Mr. Leone served as President and Chief Executive Officer at Cambrex Corporation, and as Senior Vice President and Chief Operating Officer of U.S. Commercial Operations at Aventis Pharmaceuticals, or Aventis. While at Aventis, he played a key role in spearheading the successful integration of its predecessor companies, Rhone-Poulenc Rorer and Hoechst Marion Roussel, and had responsibility for all commercial business units, including oncology, metabolism, cardiovascular, dermatology, respiratory and anti-infective. Mr. Leone currently serves on the Board of Pernix Therapeutics Holdings, Inc. and served on the Board of ViroPharma Incorporated from January 2006 until its acquisition in March 2014. Mr. Leone received his B.S. degree in Engineering from the U.S. Military Academy at West Point and his M.B.A. from the University of Colorado.

Mr. Leone's extensive commercial experience and expertise in the financing of life sciences companies, along with his leadership experience provide him with the qualifications and skills to serve on our Board.

Joseph M. Mahady. Mr. Mahady has served as a member of our Board since January 2013. He also serves as Chairman of the Board's compensation committee and as a member of the audit committee. Mr. Mahady has extensive strategic and operational experience in the biopharmaceutical industry. He has broad international commercial experience, having served in a direct leadership role in more than 30 product launches, and has a successful record of developing profitable businesses based on transformational technologies in both the U.S. and international markets. Mr. Mahady held significant leadership positions during his 30-year career with Wyeth Corporation, including as President, Wyeth Pharmaceuticals from 2008 to 2009, and Senior Vice President, Wyeth Corporation from 2002 to 2009 with responsibility to direct the worldwide operations of that company's $20 billion global pharmaceutical business. He retired from Wyeth Corporation in 2009. Since his retirement, Mr. Mahady served as Chairman of Lumara Health (formerly KV Pharmaceuticals) from 2013 to 2014, and as a member of the Boards of Directors of Albemarle from 2012 to 2015, EKR Therapeutics from 2011 to 2012 and Strongbridge Biopharma from 2012 to 2015. He currently serves on the Board of Advisors for Nevakar, Inc. Mr. Mahady received his B.S. degree in Pharmacy from St. John's University College of Pharmacy and his M.B.A. in Pharmaceutical Studies from Fairleigh Dickinson University.

Mr. Mahady's extensive insight into the biopharmaceutical industry provides him with the qualifications and skills to serve on our Board.

Bruce A. Peacock. Mr. Peacock has served as a member of our Board since September 2010 and is a member of the Board's nominating and governance committee. Mr. Peacock served as Executive Chairman at Carma Therapeutics, a pre-clinical stage biotechnology company, from November 2016 to June 2019. From August 2013 to September 2014, Mr. Peacock served as Chief Financial and Business Officer of Ophthotech Corporation, having served as Chief Business Officer since September 2010. Previously, he served as President and Chief Executive Officer of Alba Therapeutics; Chief Executive Officer and Director of The Little Clinic, a medical care services company; President and Chief Executive Officer and a Director of Adolor Corporation, a publicly-held biotechnology company; President, Chief Executive Officer and a Director of Orthovita Inc., a publicly-held orthopaedic biomaterials company; Executive Vice President, Chief Operating Officer and a Director of Cephalon Inc.; and Chief Financial Officer of Centocor Inc. Mr. Peacock serves as Co-Chairman of the Board of Alba Therapeutics and as a member of the board of directors, since July 2014, of Ocular Therapeutix, a publicly-held biopharmaceutical company. Mr. Peacock previously served as a member of the Board of Applied Genetic Technologies Corporation from March 2015 until August 2016. Since 2012, Mr. Peacock has served as a member of the Board of Invisible Sentinel, Inc., and from 2015 to 2019, a member of the Board of PanOptica, Inc. Mr. Peacock earned a bachelor's degree in Business Administration from Villanova University and is a certified public accountant.

Mr. Peacock brings to our Board extensive biotech and pharmaceutical experience, including financial expertise in debt, equity capital and alliance transactions. He also has significant experience in drug development, having led the effort to gain regulatory approval for several drug candidates in the U.S. and in other major markets worldwide. Mr. Peacock also has had responsibility for marketing, commercial and manufacturing operations.

Mr. Peacock's prior executive and leadership experience and his extensive experience in the biotech and pharmaceutical industry provide him with the qualifications and skills to serve on our Board.

Brian Schreiber, M.D. Dr. Schreiber has served as a member of our Board since December 21, 2018 and in March 2019 became a member of the Board's compensation committee. Dr. Schreiber is a Board-Certified Nephrologist and Internist with extensive industry and clinical experience, specializing in rare diseases. Dr. Schreiber is currently the Chief Medical Officer for Cerium Pharmaceuticals, a company who leverages the basic drug discovery work performed by others and moves drug candidates through the clinical and regulatory development processes. Since 2015, Dr. Schreiber has also served as President and Managing Partner for Metabolism Disease Consultants, focusing on drug development, clinical trial design and in-licensing clinical guidance. Dr. Schreiber also served as Vice President of Medical Development at Relypsa and spent 14 years at Sigma-Tau Pharmaceuticals as consultant medical director and Vice President of its Medical Affairs Department. Dr. Schreiber's clinical experience includes his role as Chief Medical Director of Dialysis Care Inc., a multi-center dialysis chain providing services in the Northeast and Central Wisconsin and Chairman of Nephrology at LaSalle Clinic, Affinity Medical System, serving as its first president until 2001. Dr. Schreiber has also continued his activities in academia as Assistant Clinical Professor of Medicine, Department of Medicine, Division of Nephrology, Medical College of Wisconsin since 2001, and has published numerous academic papers, given a variety of lectures, and ran various symposia.

Dr. Schreiber's extensive medical knowledge and experience with drug development and regulation provide him with the qualifications and skills to serve on our Board.

Daniel E. Geffken. Mr. Geffken has served as a member of our Board since April 24, 2019 and was also appointed Chairman of the Board's audit committee and as a member of the compensation committee. Since 2011, Mr. Geffken has been serving as the Founding Managing Partner of Danforth Advisors, a leading financial and strategy consulting firm to the life sciences industry. He has served as chief financial officer and strategic consultant to numerous companies, including Apellis Pharmaceuticals, Cidara Therapeutics, Cabaletta Bio, Homology Medicines, Stealth BioTherapeutics and Transkaryotic Therapies. Mr. Geffken has served on the Board of Elicio Bio, Alcobra Ltd. and Arcturus Inc., after its merger with Alcobra. Since 2013, he has assisted in ten initial public offering filings. Over the course of his career, he has assisted in raising more than $1 billion in equity and debt securities for life sciences companies.

Mr. Geffken's deep understanding of the industry in which we operate, in corporate financial management, and his overall business acumen and insights provide him with the qualifications and skills to serve on our Board.

Family Relationships

There are no family relationships among our directors and executive officers.

Board Leadership Structure

Our Board is currently composed of six members. In accordance with our Amended and Restated By-Laws, or By-Laws, each director is elected at our Annual Meeting of Stockholders. Each director holds office until our next Annual Meeting of Stockholders and until his or her successors have been duly elected and qualified, or until such director's death, or until such director shall have resigned, or have been removed.

We believe that the Board should remain free to configure the leadership of the Board and the Company in a way that best serves the interests of the Company and its stockholders at the time and, accordingly, has no fixed policy with respect to combining or separating the offices of the Chairman of the Board and the Chief Executive Officer.

Role of Board in Risk Oversight

One of the key functions of our Board is to oversee our risk management process. Our Board does not have a standing risk management committee, but rather administers this oversight function directly through our Board as a whole, as well as through various standing committees of our board of directors that address the risks inherent in their respective areas of oversight. In particular, our Board is responsible for monitoring and assessing strategic risk exposure and our audit committee has the responsibility to consider and discuss our major financial risk exposures and the steps our management has taken to monitor and control these exposures, including guidelines and policies to govern the process by which risk assessment and management is undertaken. While our Board maintains the ultimate oversight responsibility for the risk management process, its committees oversee risk in certain specified areas. For example:

- Our audit committee oversees management of financial reporting, compliance and litigation risks, including risks related to our insurance, information technology, human resources and regulatory matters, as well as the steps management has taken to monitor and control such exposures.

- Our compensation committee is responsible for overseeing the management of risks relating to our executive compensation policies, plans and arrangements and the extent to which those policies or practices increase or decrease risks for our company.

- Our nominating and corporate governance committee manages risks associated with the independence of our Board, potential conflicts of interest and the effectiveness of our Board.

Director Independence

Our Board has undertaken a review of its composition, the composition of its committees and the independence of each director. Based upon information provided by each director, our Board has determined that each of our directors, with the exception of Mr. Fraser, do not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director and is independent under the listing rules of Nasdaq. In making these determinations, our Board considered the current and prior relationships that each non-employee director has with our company and all other facts and circumstances our Board deemed relevant in determining their independence, including the beneficial ownership of our capital stock by each non-employee director, and the transactions involving them described in the section titled “Certain Relationships and Related Party Transactions.”

Board Committees

Our Board has established an audit committee, a compensation committee and a nominating and governance committee. The composition and responsibilities of each of the committees of our Board is described below. Members will serve on these committees until the resignation or until as otherwise determined by our Board.

Audit Committee

Our audit committee consists of Messrs. Geffken, Mahady and Leone. The chair of our audit committee is Mr. Geffken. The primary purpose of the audit committee is to assist the Board in fulfilling its oversight responsibilities relating to our accounting, reporting and financial practices, and our compliance with all related legal and regulatory requirements, including oversight of:

- the maintenance by management of the reliability and integrity of the Company’s accounting policies, financial reporting and disclosure practices, and tax compliance;

- the establishments and maintenance by management of processes to ensure that an adequate system of internal control is functioning within the Company; and

- the establishment and maintenance by management of processes to ensure compliance by the Company with all applicable laws, regulations and Company policy.

In addition, the audit committee is responsible for, among other things, the appointment, compensation and oversight of the work of any registered public accounting firm engaged (including resolution of disagreements between management and the auditor regarding financial reporting), reviewing the range and cost of audit and non-audit services performed by our independent accountants, reviewing the adequacy of our systems of internal control, and reviewing all related party transactions. In discharging its role, the audit committee is empowered to investigate any matter brought to its attention and has full access to all our books, records, facilities and personnel. The audit committee also has the power to retain such legal, accounting and other advisors as it deems necessary to carry out its duties.

The Board has adopted a written Audit Committee Charter. The composition and responsibilities of the audit committee and the attributes of its members, as reflected in its Charter, are intended to be in accordance with certain listing requirements of Nasdaq and the rules of the SEC for corporate audit committees. The Audit Committee Charter may be found on our website at www.windtreetx.com. All members of our audit committee are “independent” as defined in Rule 5605(a)(2) of the Nasdaq Listing Rules and the financial sophistication requirements of the SEC rules. The Board has determined that Mr. Geffken is an “audit committee financial expert” as defined under SEC rules.

Compensation Committee

Our compensation committee consists of Messrs. Mahady and Geffken and Dr. Schreiber. Each member of this committee is a non-employee director, as defined by Rule 16b-3 promulgated under the Exchange Act and meets the requirements for independence under the current Nasdaq Listing Rules. The chair of our compensation committee is Mr. Mahady. The compensation committee is responsible for, among other things:

- Reviewing management of the Company's policies regarding compensation policies relating to executive and general compensation;
- Reviewing and approving corporate goals and objectives relating to the composition of our Chief Executive Officer, executive officers and other senior officers, evaluate performance of executive officers and other senior officers and determine the Chief Executive Officer's and other executive officers' compensation level based on the compensation committee's evaluation;
- Reviewing, approving and establishing guidelines for the compensation of Board directors, including appropriate levels of compensation for service on Board committees; and
- Oversee the key employee benefits programs, policies and plans relating to the compensation, benefits and equity incentives of the Company's executives and, where deemed appropriate by the Committee, those programs, policies and plans relating to the Company's other employees.

The Board has adopted a written Compensation Committee Charter. The composition and responsibilities of the compensation committee, as reflected in its Charter, satisfy the applicable rules of the SEC and the listing requirements of Nasdaq. The Compensation Committee Charter may be found on our website at www.windtreetx.com.

Nominating and Governance Committee

Our nominating and governance committee consists of Messrs. Leone and Peacock and Dr. Schreiber. The chair of our nominating and governance committee is Mr. Leone. Each member of the nominating and governance committee meets the requirements for independence under the listing requirements of Nasdaq. The nominating and governance committee is responsible for, among other things:

- Identifying, evaluating and approving a slate of nominees for election to the Board at the Annual Meeting of Stockholders or any other meetings of stockholders and reviewing the qualifications, experience and fitness for service on the Board of any potential directors;
- Determining the criteria for selection by the Board of the Chairman of the Board, the individual directors and the members of the committees of the Board;
- Reviewing, evaluating and approving all stockholder proposals submitted to the Company and the timeliness of the submission therefor and recommending to the Board appropriate action on each such proposal;
- Evaluating and, if deemed necessary, recommending, the termination of membership of any director in accordance with the applicable code of conduct or ethics of the Company, if any, or any corporate governance principles adopted by the Company or the Board, for cause or for any other appropriate reason; and
- Reviewing annually the performance of the Board and each committee of the Board.

The Board has adopted a written Nominating and Governance Committee Charter. The composition and responsibilities of the nominating and governance committee, as reflected in its Charter, satisfy the applicable rules of the SEC and the listing requirements of Nasdaq. The Nominating and Governance Committee Charter may be found on our website at www.windtreetx.com.

Code of Business Conduct and Ethics

We have adopted a Code of Business Conduct and Ethics that applies to our officers, including our principal executive, financial and accounting officers, and our directors and employees. We have posted the Code of Business Conduct and Ethics on our Internet website at “http://www.windtreetx.com” under the “Company” tab in the Corporate Governance section. We intend to make all required disclosures on our website concerning any amendments to, or waivers from, our Code of Business Conduct and Ethics with respect to our executive officers and directors.

EXECUTIVE AND DIRECTOR COMPENSATION

Named Executive Officers

Our named executive officers for the year ended December 31, 2019, which consists of our principal executive officer and our two other most highly compensated executive officers, are:

- Craig Fraser, our President and Chief Executive Officer;
- Steven G. Simonson, M.D., our Senior Vice President and Chief Medical Officer; and
- John A. Tattory, our Senior Vice President, Chief Financial Officer and Treasurer.

The following table presents summary information regarding the total compensation that was awarded to, earned by or paid to our named executive officers for services rendered during the years ended December 31, 2018 and 2019.

Summary Compensation Table

Name and Principal Position	Year	Salary ($)	Bonus ($)(3)	Stock Awards ($)(1)	Option Awards ($)(1)	All Other Compensation ($)(2)	Total ($)
Craig Fraser							
President and Chief Executive	2019	$ 452,381	$ 226,038	$ 31,695	$ 345,130	$ 12,500	$ 1,067,744
Officer	2018	437,068	226,038	274,359	4,287,110	-	5,224,575
Steven G. Simonson, M.D.							
Senior Vice President and	2019	377,437	149,420	15,085	172,565	11,400	725,907
Chief Medical Officer	2018	346,704	149,420	130,581	2,500,814	-	3,127,519
John A. Tattory							
Senior Vice President,	2019	336,944	151,522	14,164	172,565	8,400	683,595
Chief Financial Officer and Treasurer	2018	325,538	151,522	122,609	2,500,814	-	3,100,483

(1) The aggregate grant date fair value of such awards were computed in accordance with Financial Accounting Standards Board ASC Topic 718, Stock Compensation, or ASC Topic 718, and do not take into account estimated forfeitures related to service-based vesting conditions, if any. The valuation assumptions used in calculating these values are discussed in Note 15 of the Audited Consolidated Financial Statements appearing elsewhere herein. These amounts do not represent actual amounts paid or to be realized. Amounts shown are not necessarily indicative of values to be achieved, which may be more or less than the amounts shown as awards are subject to time-based vesting.

(2) The reported amount reflects the Company match under our 401(k) Plan.

(3) This amount represents the portion of each named executive officer's strategic bonus that was paid on October 4, 2019. The amount of each named executive officer's fiscal year 2019 bonus has not yet been determined as of the effective date of this registration statement. We expect this information will be determined on or before March 30, 2020.

Narrative Disclosure to Summary Compensation Table

Elements of Compensation

The compensation of our named executive officers generally consists of base salary, annual cash bonus opportunities, long term incentive compensation in the form of equity awards and other benefits, as described below.

Base Salary

The base salary payable to each named executive officer is intended to provide a fixed component of compensation reflecting the named executive officer's skill set, experience, role, responsibilities, and contributions. Effective February 1, 2019, the base salaries of Messrs. Fraser and Tattory and Dr. Simonson were increased from $440,274 to $453,482, from $327,926 to $337,764, and from $349,247 to $380,000, respectively.

Annual Cash Bonus Opportunities

The performance-based cash bonus opportunity for each of our named executive officers is expressed as a percentage of the applicable named executive officer's base salary that can be achieved at a target level by meeting predetermined corporate and individual performance objectives. Each executive's target bonus for the year is set forth in their employment agreements, as may be amended by the compensation committee from time to time. On March 19, 2019, the compensation committee established that the 2019 annual target bonus amount for Mr. Fraser be targeted at 50% of his base salary and for each of Mr. Tattory and Dr. Simonson be targeted at 40% of their respective base salaries (representing an increase from the original annual target bonus amount of 30% of their respective base salaries, as originally set forth in each of the respective employment agreements for Mr. Tattory and Dr. Simonson).

As of the effective date of this registration statement, the actual amount of each named executive officer's fiscal year 2019 bonus has not been determined by the compensation committee. We expect this information will be determined on or before March 30, 2020.

Strategic and Retention Bonus

On November 16, 2018, the compensation committee approved a Strategic and Retention Bonus Program, or the Strategic Bonus. The program provides for payment of a bonus to certain key employees, including our named executive officers, upon completion of an eligible transaction, which is defined under the program to include a (i) strategic transaction and (ii) one or more financings within a nine-month period that results in proceeds of at least $30 million. The bonus amount for each executive varies under the program and is based on the following criteria: (x) to the extent that the amount raised in the financing(s) is less than $45 million, then the amount of the bonus to be paid is reduced in a stepped-down fashion as outlined in the program; and (y) the individual bonus amount is determined by application of a multiplier to the executive's base salary. The individual multiplier varies based on (a) the executive's position and (b) the amount raised in a financing between $30 million and $45 million, which individual multiplier for Messrs. Fraser and Tattory and Dr. Simonson is between 0.2 and 1.5, 0.27 and 1.35, and 0.25 and 1.25, respectively. Once determined, the bonus is payable in two equal installments, the first within five business days of the closing of the strategic transaction, and the second on the nine-month anniversary of the closing of the strategic transaction, provided that the executive is actively employed with us at the time of the payment. With respect to the CVie Acquisition and 2018 Private Placement Financing, based on an aggregate raise of $39 million, each of Messrs. Fraser and Tattory and Dr. Simonson became eligible to receive aggregate Strategic Bonuses equal to $452,076, $303,044 and $298,840, respectively. On December 31, 2018, we paid the first installment of the Strategic Bonuses to Messrs. Fraser and Tattory and Dr. Simonson in the amounts of $226,038, $151,522 and $149,420, respectively. On October 4, 2019, we paid the second installment to Messrs. Fraser and Tattory and Dr. Simonson in the amounts of $226,038, $151,522 and $149,420, respectively.

Equity-Based Incentive Awards

Our equity-based incentive awards are designed to align our interests and the interests of our stockholders with those of our employees and consultants, including our named executive officers. Our Board or compensation committee approves equity grants, which have historically been in the form of stock options or restricted stock units, or RSUs.

In February 2019, the compensation committee determined that issuance of certain of the RSUs granted in 2017 exceeded the limit that no more than 750,000 shares per person per year could be issued under our 2011 Long-Term Incentive Plan, or 2011 Plan. Accordingly, we issued replacement RSU grants as more fully described in "2017 Change of Control" below.

On March 19, 2019, the compensation committee approved grants of stock options to Messrs. Fraser and Tattory and Dr. Simonson to purchase 100,000, 50,000 and 50,000 shares of our common stock, respectively, each with a per-share exercise price of $4.30. All options vest in equal annual installments on each of the first three anniversaries of the date of grant, subject to the named executive officer's continuous service through the relevant vesting dates; provided, however, that such stock options may be eligible to fully accelerate in vesting in connection with a termination of employment as further described in the section titled "Executive Employment Agreements" below. See the section titled "Executive Compensation – Outstanding Equity Awards at Fiscal Year-End" for more information regarding equity awards made to our named executive officers.

Other Benefits

We currently provide broad-based welfare benefits that are available to all of our employees, including our named executive officers, including health, dental, life, vision and disability insurance.

In addition, we maintain, and the named executive officers participate in, our 401(k) savings plan, or 401(k) Plan, that is intended to be qualified under Section 401(a) of the Code and that provides eligible employees with an opportunity to save for retirement on a tax advantage basis and under which we are permitted to make discretionary employer contributions. Employees' pre-tax contributions are allocated to each participant's individual account and are then invested in selected investment alternatives according to the participants' directions. Since inception of the 401(k) Plan, we have not made any discretionary employer contributions. The 401(k) Plan also includes a company match to be made in cash, subject to there being sufficient cash resources as determined in the sole discretion of the compensation committee, in an amount per participant equal to 50% of each participant's contribution (up to a maximum of 6% of the participant's base salary) to the 401(k) Plan. The match was not made in 2018, but was reinstituted in 2019.

We do not maintain any defined benefit pension plans or nonqualified deferred compensation plans.

Executive Employment Agreements

We are party to executive employment agreements, as amended from time to time, or the Executive Agreements, with each of our named executive officers, the key terms of which are described below.

Mr. Fraser

We entered into an Executive Agreement with Mr. Fraser, effective February 1, 2016. Mr. Fraser's Executive Agreement provides for an initial base salary of $415,000, which has subsequently been increased to $453,482, and eligibility to receive an annual incentive-based cash bonus, which may be awarded at the discretion of the compensation committee, with a target amount equal to 50% of his base salary.

If Mr. Fraser's employment is terminated due to death or Disability (as such term is defined in the Executive Agreement), all equity awards held by Mr. Fraser shall accelerated and become fully vested.

If Mr. Fraser's employment is terminated by us without Cause or by Mr. Fraser for Good Reason prior to a Change in Control (as such term is defined in the Executive Agreement) or after the 2nd anniversary of a Change in Control, Mr. Fraser will be eligible to receive the following, in addition to any amounts or benefits that are due under any of our vested plans or other policies, and on the condition that he enters into a separation agreement containing a final and effective plenary release of claims in a form acceptable to us, provided that all of our obligations shall cease if Mr. Fraser engages in a material breach of the Executive Agreement and fails to cure such breach within five business days after receipt from us of notice of such breach:

- A pro rata bonus equal to a percentage of the named executive officer's target bonus amount determined by dividing the total actual bonuses paid to other contract executives for the year in which the termination occurs by the aggregate of such other contract executives' total target bonuses for that year, and further prorated for the number of days the named executive officer was employed in the year of termination, payable at the time that other contract executives are paid bonuses with respect to the year of termination;

- A severance amount equal to the sum of the named executive officer's base salary then in effect (determined without regard to any reduction constituting Good Reason) and the target bonus amount, payable in equal installments in accordance with our regular payroll schedule from the date of termination to the date that is 12 months after the date of termination, or the Severance Period;

- All vested stock options and other similar equity awards held by the named executive officer shall continue to be exercisable during the Severance Period; and

- During the Severance Period, if the named executive officer elects to continue medical benefits through the Consolidated Omnibus Budget Reconciliation Act of 1985, or COBRA, we will continue to pay our costs of the named executive officer's and the named executive officer's dependents' benefits as in effect on the date of termination as such benefits are provided to active employees.

If Mr. Fraser's employment is terminated by us without Cause or by Mr. Fraser for Good Reason upon a Change in Control or prior to the 2nd anniversary of a Change in Control, or the Change in Control Period, Mr. Fraser will be eligible to receive the following, in addition to any amounts or benefits that are due under any of our vested plans or other policies, and on the condition that he enters into a separation agreement containing a final and effective plenary release of claims in a form acceptable to us, provided that all of our obligations shall cease if Mr. Fraser engages in a material breach of the Executive Agreement and fails to cure such breach within five business days after receipt from us of notice of such breach:

- A pro rata bonus equal to the executive's target bonus amount and prorated for the number of days the named executive officer was employed in the year of termination, payable in a lump sum within 10 days after the date of termination;

- A severance amount equal to 1.5 times the sum of the named executive officer's base salary then in effect (determined without regard to any reduction constituting Good Reason) and the target bonus amount, payable in a lump sum within 10 days after the date of termination except in certain limited circumstances;

- All equity awards held by the named executive officer shall accelerate and become fully vested; and

- For a period of 18 months following the termination date, if the named executive officer elects to continue medical benefits through COBRA, we will continue to pay our costs of the named executive officer's and the named executive officer's dependents' benefits as in effect on the date of termination as such benefits are provided to active employees.

In addition, upon a Change of Control, for a period of 24 months after the date of the Change of Control and provided that Mr. Fraser is employed on the last day of a fiscal year ending in that period, Mr. Fraser will be entitled to an annual bonus at least equal to Mr. Fraser's target bonus amount, payable no later than March 15 in the next succeeding fiscal year.

Mr. Fraser's Executive Agreement includes 12-month post-employment non-competition and non-solicitation covenants and provide for confidentiality and the assignment to us of all intellectual property.

Mr. Tattory

We entered into an Executive Agreement with Mr. Tattory, effective March 21, 2014. Mr. Tattory's Executive Agreement provides for an initial base salary of $260,000, which has subsequently been increased to $337,764, and eligibility to receive an annual incentive-based cash bonus, which may be awarded at the discretion of the compensation committee, with a target amount equal to 30% of his base salary, which has subsequently been increased to 40% of his base salary.

If Mr. Tattory's employment is terminated by us without Cause or by Mr. Tattory for Good Reason (either during or not during the Change in Control Period) or due to death or Disability, Mr. Tattory will be eligible to receive severance benefits that are substantially similar to the severance benefits provided to Mr. Fraser under such circumstances.

In addition, upon a Change of Control, for a period of 24 months after the date of the Change of Control and provided that Mr. Tattory is employed on the last day of a fiscal year ending in that period, Mr. Tattory will be entitled to an annual bonus at least equal to Mr. Tattory's target bonus amount, payable no later than March 15 in the next succeeding fiscal year.

Mr. Tattory's Executive Agreement includes 12-month post-employment non-competition and non-solicitation covenants and provide for confidentiality and the assignment to us of all intellectual property.

Dr. Simonson

We entered into an Executive Agreement with Dr. Simonson, effective December 19, 2014. Dr. Simonson's Executive Agreement provides for an initial base salary of $300,000, which has subsequently been increased to $380,000, and eligibility to receive an annual incentive-based cash bonus, which may be awarded at the discretion of the compensation committee, with a target amount equal to 30% of his base salary, which has subsequently been increased to 40% of his base salary.

If Dr. Simonson's employment is terminated by us without Cause or by Dr. Simonson for Good Reason (either during or not during the Change in Control Period) or due to death or Disability, Dr. Simonson will be eligible to receive severance benefits that are substantially similar to the severance benefits provided to Mr. Fraser under such circumstances.

In addition, upon a Change of Control, for a period of 24 months after the date of the Change of Control and provided that Dr. Simonson is employed on the last day of a fiscal year ending in that period, Dr. Simonson will be entitled to an annual bonus at least equal to Dr. Simonson's target bonus amount, payable no later than March 15 in the next succeeding fiscal year.

Dr. Simonson's Executive Agreement includes 12-month post-employment non-competition and non-solicitation covenants and provide for confidentiality and the assignment to us of all intellectual property.

2017 Change of Control

Effective October 27, 2017, a subsidiary of Lee's invested $10 million in us and acquired 73% of our issued and outstanding shares of common stock, which constituted a Change of Control under the Executive Agreements. The purchase agreement also amended our named executive officers' Executive Agreements to provide, solely with respect to Lee's purchase, Messrs. Fraser and Tattory and Dr. Simonson waived payment of the target annual bonus amounts that otherwise would have been payable in the 24-month period immediately following the closing. In addition, each executive was awarded RSUs, having a value when issued equal to the combined total value of such executive's waived 2017 and 2018 target annual bonus amounts, which were scheduled to vest in two equal tranches on December 28, 2018 and March 15, 2019. In February 2019, we determined that issuance of certain of the RSUs granted in 2017 exceeded the limit that no more than 750,000 shares per person per year could be issued under our 2011 Plan. Since the shares of common stock underlying the RSUs granted in 2017 had not yet been delivered to the named executive officers following the first originally scheduled December 28, 2018 vesting date, we canceled the first and second tranche of the RSUs granted to Mr. Fraser because each tranche exceeded the limit and we also canceled the second tranche of the RSUs granted to Mr. Tattory and Dr. Simonson because the total grant was in excess of the limit but the first tranche was within the limit. Concurrently with the cancellations, we issued equivalent replacement RSU grants for the first and second tranche of Mr. Fraser's cancelled RSU and the second tranche of Mr. Tattory's and Dr. Simonson's cancelled RSU, which, following our reverse stock split in December 2017, no longer exceeded the individual limit under the 2011 Plan. The replacement RSU grants were issued with a vesting date of March 15, 2019.

Outstanding Equity Awards at Fiscal Year-End

The following table shows the number of shares of our common stock underlying outstanding equity awards held by the named executive officers as of December 31, 2019.

		Option Awards			
Name	Grant Date	Number of Securities Underlying Unexercised Options – Exercisable (#)(1)	Number of Securities Underlying Unexercised Options – Unexercisable (#)(1)	Option Exercise Price ($)	Option Expiration Date
Craig Fraser	02/02/16	10,243		46.60	02/02/26
	07/28/16	2,000		35.40	07/28/26
	03/01/17	3,333	1,667	24.60	03/01/27
	12/24/18	421,906	843,811	4.22	12/24/28
	03/19/19		100,000	4.30	03/19/29
Steven G. Simonson, M.D.	05/19/14	429		476.00	05/19/24
	03/27/15	982		327.60	03/27/25
	02/02/16	1,786		46.60	02/02/26
	07/28/16	1,250		35.40	07/28/26
	03/01/17	1,833	917	24.60	03/01/27
	12/24/18	246,112	492,223	4.22	12/24/28
	03/19/19		50,000	4.30	03/19/29
John A. Tattory	10/07/11	268		512.40	10/07/21
	05/04/12	143		758.80	05/04/22
	03/26/13	286		660.80	03/26/23
	03/06/14	322		722.40	03/06/24
	03/27/15	536		327.60	03/27/25
	02/02/16	1,161		46.60	02/02/26
	07/28/16	1,250		35.40	07/28/26
	03/01/17	1,833	917	24.60	03/01/27
	12/24/18	246,112	492,223	4.22	12/24/28
	03/19/19		50,000	4.30	03/19/29

(1) All options vest and become exercisable in equal installments on each of the first three anniversaries of the applicable grant date, assuming that the named executive officer continues to be employed with us through each vesting date.

Director Compensation

Directors who are also employees are not compensated separately for serving on the Board or any of its committees. Each of our non-employee directors receives cash compensation for his services. Effective April 24, 2019, the compensation committee and Board approved cash compensation for non-employee directors as follows: (i) $10,000 per quarter for all directors other than the Chairman of the Board, and $16,250 per quarter for the Chairman of the Board; (ii) $3,750 per quarter for the director who served as Chairman of the Audit Committee; (iii) $2,500 per quarter for the director who served as Chairman of the compensation committee; (iv) $1,875 per quarter for the director who served as Chairman of the nominating and governance committee; (v) $1,750 per quarter for each director who served as a non-Chairman member of the Audit Committee; (vi) $1,250 per quarter for each director who served as a non-Chairman member of the compensation committee; and (vii) $1,000 per quarter for each director who served as a non-Chairman member of the nominating and governance committee. In addition, to better align the interests of our Board with our stockholders, the compensation committee considers and recommends to the Board long-term equity compensation.

The compensation committee periodically conducts reviews of peer company director compensation practices, including before considering changes to our director compensation policy and amounts.

On April 24, 2019, the compensation committee approved an initial director award to each of Messrs. Huang and Geffken and Dr. Schreiber of an option to purchase 60,000 shares of our common stock. The awards for Mr. Huang and Dr. Schreiber are eligible to vest in three equal annual installments as measured from the applicable director's appointment date to the Board, subject to the applicable director's continued service with us through the applicable vesting date. The award for Mr. Geffken is eligible to vest in three equal annual installments as measured from the grant date, subject to his continued service with us through the applicable vesting date.

On June 28, 2019, the compensation committee approved an award to each of Messrs. Leone, Mahady and Peacock of an option to purchase 40,000 shares of our common stock. The awards for Messrs. Leone, Mahady and Peacock are eligible to fully vest on the first anniversary of the grant date, subject to the applicable director's continued service with us through such date.

The foregoing option awards for our non-employee directors were issued pursuant to our 2011 Plan and approved after due consideration of the practices of other similarly situated biotechnology companies in providing equity compensation to their non-employee directors.

The following chart summarizes the cash and non-cash compensation earned or paid to our non-employee directors during the year ended December 31, 2019.

Name	Fees Earned or Paid in Cash ($)	Option Awards ($)(1)(2)	Total ($)
John R. Leone	$ 54,500	$ 147,684	$ 202,184
Joseph M. Mahady	56,687	147,684	204,371
Bruce A. Peacock	48,698	147,684	196,382
James Huang	63,434	208,044	271,478
Brian D. Schreiber, M.D.	44,615	208,044	252,659
Daniel E. Geffken	41,209	208,044	249,253

(1) The aggregate grant date fair value of such awards were computed in accordance with ASC Topic 718 and do not take into account estimated forfeitures related to service-based vesting conditions, if any. The valuation assumptions used in calculating these values are discussed in Note 15 of the Audited Consolidated Financial Statements appearing elsewhere herein. These amounts do not represent actual amounts paid or to be realized. Amounts shown are not necessarily indicative of values to be achieved, which may be more or less than the amounts shown as awards are subject to time-based vesting.

(2) As of December 31, 2019, Messrs. Leone and Mahady each held options to purchase 73,019 shares of our common stock, Mr. Peacock held options to purchase 73,136 shares of our common stock, and Messrs. Huang and Geffken and Dr. Schreiber each held options to purchase 60,000 shares of our common stock.

In addition to the items included in the foregoing chart, directors are entitled to reimbursements for their travel, lodging and other expenses incurred in connection with attendance at meetings of the Board, Board committee meetings and related activities.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

We describe below transactions and series of similar transactions, during our last three fiscal years or currently proposed, to which we were a party or will be a party, in which:

- the amounts involved exceeded $120,000; and
- any of our directors, executive officers or beneficial holders of more than 5% of any class of our capital stock had or will have a direct or indirect material interest.

Other than as described below, there have not been, nor are there any currently proposed, transactions or series of similar transactions meeting this criteria to which we have been or will be a party other than compensation arrangements, which are described where required under the sections titled "Management—Board Leadership Structure" and "Executive Compensation."

Lee's Pharmaceutical Holdings Limited and Affiliates

We have received substantial support from Lee's, our largest shareholder. Lee's is a company incorporated in the Cayman Islands with limited liability, whose common stock is listed on the Hong Kong Stock Exchange, and which along with its affiliates currently owns approximately 35% of our issued and outstanding common stock.

On December 6, 2019, in connection with the December 2019 Private Placement, we issued and sold 1,655,629 shares of our common stock to LPH II, a wholly-owned subsidiary of Lee's, for an approximate aggregate purchase price of $5 million, including the conversion of $2.95 million of existing debt obligations on the same terms as the other select institutional investors. In addition, we also issued 827,815 Series I Warrants to purchase 827,815 shares of our common stock at an exercise price of $4.03 per share to LPH II. Lee's and its affiliate, LPH II, are beneficial owners of more than 5% of our capital stock.

On October 24, 2019, we entered into a Loan Agreement with LPH II, a Cayman Islands company. Under the Loan Agreement, LPH II agreed to lend us $1,000,000, or the 2019 Loan, to support our operations while we sought to complete a strategic transaction (as defined in the Loan Agreement). The 2019 Loan, which was funded in a single installment by wire transfer on October 28, 2019, accrued interest at a rate of 6% per annum and matured upon the closing date of the December 2019 Private Placement, which qualified as the strategic transaction under terms defined in the Loan Agreement. We repaid the 2019 Loan in full upon consummation of the December 2019 Private Placement.

Lee's also supported our development activities and operations with loans made through certain subsidiaries as follow: August 2017, $3.9 million loaned by Lee's (HK); January and March 2018, $1.5 million and $1 million, respectively, loaned by LPH; on August 14, August 29, September 12, September 27, October 19, November 2, and November 19, 2018, $0.3 million, $0.48 million, $0.5 million, $0.5 million, $0.43 million, $0.5 million, and $0.35 million, respectively, loaned by LPH; and on December 5, 2018, $0.6 million, loaned by LPH II, to support our development activities and operations while we pursued our potential strategic transaction with CVie Therapeutics. The loans accrued interest at a rate per annum of 6% and were collateralized by a security interest in substantially all our assets under the terms of a Security Agreement dated March 1, 2018. These loans were repaid in full and extinguished in connection with the 2018 Private Placement Financing.

During 2018, we engaged in active diligence and discussions with CVie Therapeutics, a Taiwan corporation organized under the laws of China, to potentially conclude a strategic transaction. At that time, Lee's owned approximately 49% of the outstanding capital stock of CVie Therapeutics, but because of the potential conflict of interest, did not participate in the negotiations and agreed to be bound by the terms otherwise reached between ourselves and CVie Therapeutics, which was represented by James Huang, an independent director.

On December 21, 2018, we closed the CVie Acquisition with CVie Investments, an exempted company with limited liability incorporated under the laws of the Cayman Islands. Under the terms of the Acquisition Agreement, we issued shares of our common stock to CVie Investments' former shareholders at an exchange ratio of 0.3512 share of common stock for each share of CVie Investments outstanding prior to the acquisition, resulting in the issuance of 16,256,060 shares of common stock in exchange for the outstanding shares of CVie Investments. The CVie Acquisition closed on December 21, 2018.

Lee's, through its wholly-owned subsidiary China Cardiovascular Focus Limited, or CCF, owned approximately 49% of the outstanding capital stock of CVie Therapeutics, but because of the potential conflict of interest, did not participate in the negotiations and agreed to be bound by the terms otherwise reached between ourselves and CVie Therapeutics, which was represented by James Huang, an independent director. To facilitate the transaction, Lee's committed to maintain in place collateral previously pledged to secure certain of CVie's debt and agreed to provide an indemnity agreement to protect our shareholders and holders of certain warrants, as discussed above.

In connection with the CVie Acquisition, CCF received 8,063,861 shares of our common stock, for an approximate aggregate purchase price of $33.5 million, in exchange for its shares of CVie Therapeutics. In addition, LPH II, a wholly-owned subsidiary of Lee's, converted $6 million of existing debt obligations in the CVie Acquisition on the same terms as the other investors party to the Securities Purchase Agreement dated December 21, 2018, whereby we issued to LPH II (i) 1,810,938 shares of our common stock, (ii) 307,859 Series F Warrants to purchase 307,859 shares of our common stock at an exercise price of $3.68 per share, and (iii) 597,610 Series G Warrants to purchase 597,610 shares of our common stock at an exercise price of $4.05 per share.

We are also party to a License, Development and Commercialization Agreement, as amended, with Lee's (HK), a company organized under the laws of Hong Kong and an affiliate of Lee's, whereby we have granted to Lee's (HK) an exclusive license to sublicense (i) develop, manufacture and commercialize our KL4 surfactant products, including SURFAXIN, which was approved by the FDA in 2012 for RDS in premature infants, SURFAXIN LS™, the lyophilized dosage form of SURFAXIN, and AEROSURF, and (ii) to register and manufacture SURFAXIN and SURFAXIN LS for use in the licensed territory, which includes the People's Republic of China, or PRC, Japan, Hong Kong, Thailand, Taiwan and 12 other countries. See the section titled "Business—Material Licenses and Collaborations" for a more detailed description.

Panacea Venture Healthcare Fund I L.P.

On December 6, 2019, in connection with the December 2019 Private Placement, we issued and sold 1,655,629 shares of our common stock to Panacea Venture Healthcare Fund I L.P., or Panacea L.P., for an approximate aggregate purchase price of $5.0 million. In addition, we also issued 827,815 Series I Warrants to purchase 827,815 shares of our common stock at an exercise price of $4.03 to Panacea L.P. Panacea L.P. is a beneficial owner of more than 5% of our capital stock. In addition, our director, James Huang, is a director of Panacea L.P.

Other Transactions

We have granted stock options to our named executive officers and certain of our directors. See the section titled "Executive Compensation – Outstanding Equity Awards at Fiscal Year-End" for a description of these stock options.

We have entered into change of control and severance agreements with certain of our executive officers that provide for certain severance and change in control benefits. See the section titled "Executive Compensation – Executive Employment Agreements."

Control by Officers and Directors

Our officers and directors and their affiliates beneficially own, in the aggregate, approximately 23.74% of our outstanding common stock as of January 15, 2020. As a result, in certain circumstances, these stockholders acting together may be able to determine matters requiring approval of our stockholders, including the election of our directors, or they may delay, defer or prevent a change in control. See the section titled "Security Ownership of Certain Beneficial Owners and Management" for more information.

Indemnification Agreements

We have entered into indemnification agreements with each of our directors and executive officers. The indemnification agreements, our Amended and Restated Certificate of Incorporation, or the Certificate of Incorporation, and our By-Laws require us to indemnify directors to the fullest extent permitted by Delaware law.

SELLING STOCKHOLDERS

This prospectus relates to the resale by the selling stockholders of common shares and warrant shares underlying the warrants. The common shares and the warrants were issued by us to the selling stockholders on December 6, 2019, in the December 2019 Private Placement. For additional information regarding the issuance of these securities in the December 2019 Private Placement, see "Management's Discussion and Analysis of Financial Condition and Results of Operations — Private Placement Offerings". We are filing the registration statement of which this prospectus is a part pursuant to the provisions of the Registration Rights Agreement, which granted the selling stockholders registration rights in connection with the December 2019 Private Placement. Except as otherwise disclosed below in the footnotes to the selling stockholders table below, the selling stockholders have not had any material relationship with us within the past three years.

The selling stockholders may from time to time offer and sell pursuant to this prospectus any or all of the common shares or the warrant shares that they acquire upon exercise of the warrants.

Under the terms of the warrants, a selling stockholder may not exercise the warrants to the extent such exercise would cause such selling stockholder, together with its affiliates and attribution parties, to beneficially own a number of shares of common stock which would exceed 4.99% (or such other percent as designated by each selling stockholder not to exceed 19.99%) of the Company's then outstanding common stock following such exercise, excluding for purposes of such determination shares of common stock issuable upon exercise of the warrants which have not been exercised. The selling stockholders may sell all, some or none of their shares of common stock in this offering. See "Plan of Distribution."

The following table presents information that has been furnished to us by the selling stockholders regarding the selling stockholders and the shares of common stock that any of the selling stockholders may offer and sell from time to time under this prospectus. This table reflects holdings as of January 15, 2020 and may change over time. Any changed information will be set forth in an amendment to the registration statement or supplement to this prospectus, to the extent required by law. As used in this prospectus, the term "selling stockholders" includes the selling stockholders or their transferees, pledgees, donees or assigns or other successors-in-interest of the selling stockholders. The number of shares of common stock in the column "Maximum Number of Shares of Common Stock to be Sold Pursuant to this Prospectus" represents all of the common shares and warrant shares that the selling stockholders may offer and sell under this prospectus. The selling stockholders may sell some, all or none of their shares. We do not know how long the selling stockholders will hold the shares before selling them, and we currently have no agreements, arrangements or understandings with the selling stockholders regarding the sale of any of the shares.

Beneficial ownership is determined in accordance with Rule 13d-3(d) promulgated by the SEC under the Exchange Act, as amended, and includes shares of common stock with respect to which the selling stockholders have voting and investment power. The offering is based on 41,091,532 shares of our common stock actually outstanding on January 15, 2020.

Name of Selling Stockholder	Number of Shares of Common Stock Beneficially Owned Prior to Offering[1]	% of Shares of Common Stock Beneficially Owned Prior to Offering[1]	Maximum Number of Shares of Common Stock to be Sold Pursuant to this Prospectus	Number of Shares of Common Stock Beneficially Owned After Offering[1] [2]	% of Shares of Common Stock Beneficially Owned After Offering[1] [2]
NongHyup Bank as Trustee of PacificBridge Global Inner Circle Fund 1	231,788	0.56%	347,682	--	--
Panacea Venture Healthcare Fund I L.P.(3)	8,634,147	19.83%	2,483,444	6,978,518	15.73%
Class Edge Limited(4)	1,655,629	4.03%	2,483,444	--	--
Tyrus Holdings	66,225	0.16%	99,338	--	--
Tyrus Industries	99,337	0.24%	149,006	--	--
Hongtao Investment-I Ltd	2,980,132	7.25%	4,470,198	--	--
Buchang Holdings (H.K.) Limited	331,126	0.81%	496,689	--	--
Intracoastal Capital, LLC(5)	74,504	0.18%	111,756	--	--
LPH II Investments Limited(6)	5,049,120	11.98%	2,483,444	3,393,491	7.90%
Rui Jin (HK) Consulting Management Company Limited(7)	210,844	0.51%	96,429	114,415	*

* Less than 1%

(1) We have determined beneficial ownership in accordance with Rule 13d-3(d) promulgated by the SEC under the Exchange Act, as amended. Certain shares of common stock issuable upon exercise of warrants are subject to beneficial ownership limitation provisions and/or exercise restrictions, as further described in the footnotes below.

(2) Assumes that all of the shares of common stock represented by this prospectus have been sold.

(3) Includes 4,527,345 shares of common stock, 769,649 shares of common stock issuable upon exercise of Series F Warrants exercisable within 60 days of January 15, 2020, 1,494,024 shares of common stock issuable upon exercise of Series G Warrants exercisable within 60 days of January 15, 2020 held by Panacea Venture Healthcare Fund I, L.P., or the Panacea Fund. Panacea Venture Healthcare Fund GP I, L.P. or the Immediate GP, is the general partner of the Panacea Fund, Panacea Venture Healthcare Fund GP Company, Ltd., or the Parent GP, is the general partner of the Immediate GP, and Panacea Venture Management Company Ltd., or the Management Company and together with the Panacea Fund, the Immediate GP and the Parent GP, the Panacea Entities, is the management company of the Immediate GP and together with Parent GP, and the Immediate GP may be deemed to have beneficial ownership over the shares of our common stock held by the Panacea Fund. Mr. Huang serves as a director of the Panacea Fund and may be deemed to beneficially own the shares held by the Panacea Fund. Mr. Huang expressly disclaims beneficial ownership of the securities reported herein, except to the extent of his pecuniary interest therein, if any. In addition, the Management Company holds 187,500 Series D Warrants to purchase 187,500 shares of our common stock exercisable within 60 days of January 15, 2020. The Panacea Entities may be deemed to constitute a “group” within the meaning of Section 13(d)(3) of the Exchange Act. Mr. Huang and Hai Mi serve as directors of the Parent GP and the Management Company. Mr. Huang, Hai Mi, and the shareholders of the Parent GP and Management Company have shared voting and investment power over the shares held by the Panacea Fund. The address of the Panacea Fund, Immediate GP, Parent GP and the Management Company is #6 Lane 1350 Middle Fuxing Rd., Xuhui District, Shanghai, China 200319.

(4) Mak Siu Hang Viola has sole voting control and investment discretion over the securities reported herein that are held by Class Edge Limited. As a result, Mak Siu Hang may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Class Edge Limited.

(5) Mitchell P. Kopin, or Mr. Kopin and Daniel B. Asher, or Mr. Asher, each of whom are managers of Intracoastal Capital LLC or Intracoastal, have shared voting control and investment discretion over the securities reported herein that are held by Intracoastal. As a result, each of Mr. Kopin and Mr. Asher may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Intracoastal.

(6) Includes 2,352,605 shares of common stock, 307,859 Series F Warrants to purchase 307,859 shares of common stock exercisable within 60 days of January 15, 2020, 597,610 Series G Warrants to purchase 597,610 shares of common stock exercisable within 60 days of January 15, 2020, 135,417 Series C warrants to purchase 135,417 shares of common stock exercisable within 60 days of January 15, 2020 held by LPH II Investments Limited, or LPH II. Lee’s Pharmaceutical Holdings Limited, or Lee’s may be deemed to have beneficial ownership of the shares held by LPH II due to its ownership of 100% of LPH II. LPH II is currently unable to exercise the Series C, F and G warrants due to an ownership cap restriction. Other than for purposes of Rule 13d-3 of the Act, Lee’s disclaims beneficial ownership of the shares of common stock and warrants, as applicable, except to the extent of its pecuniary interest therein, as applicable. The address for Lee’s and LPH II, Building 20E, Phase 3, Hong Kong Science Park, Shatin, Hong Kong. In addition, Lee’s has entered into a License, Development and Commercialization Agreement with the Company. See “Business — Material Licenses and Collaborations — Lee’s Pharmaceutical (HK) Ltd” for more information. LPH II or its affiliates have entered into several loan agreements with the Company during the past three years. See “Certain Relationships and Related Party Transactions — Pharmaceutical Holdings Limited and Affiliates” for more information.

(7) Rui Jin (HK) Consulting Management Company Limited is an entity of which James Huang, our Chairman of the Board, is a director.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

Based solely upon information made available to us, the following table sets forth information as of January 15, 2020 regarding the beneficial ownership of our common stock by:

- each person known by us to be the beneficial owner of more than 5% of the outstanding shares of our common stock;
- each of our named executive officers and directors; and
- all of our executive officers as a group.

The percentage of common stock outstanding is based on 41,091,532 shares of our common stock outstanding as of January 15, 2020. For purposes of the table below, and in accordance with the rules of the SEC, we deem shares of common stock subject to options that are currently exercisable or exercisable within sixty days of January 15, 2020 to be outstanding and to be beneficially owned by the person holding the options for the purpose of computing the percentage ownership of that person, but we do not treat them as outstanding for the purpose of computing the percentage ownership of any other person. Except as otherwise noted, each of the persons or entities in this table has sole voting and investing power with respect to all of the shares of common stock beneficially owned by them, subject to community property laws, where applicable. Except as otherwise noted below, the street address of each beneficial owner is c/o Windtree Therapeutics, Inc. 2600 Kelly Road, Suite 100, Warrington, PA 18976.

	Shares Beneficially Owned	
Name and Address of Beneficial Owner (1)	**Number of Shares**	**Percentage**
Greater than 5% Stockholder		
Lee's Pharmaceutical Holdings Limited (1)	15,558,385	36.87%
Panacea Venture Healthcare Fund I L.P. (2)	8,634,147	19.83%
Bioengine Capital (3)	4,683,586	11.09%
Ivy Blue Holding Limited (4)	4,336,790	10.55%
Tyrus-DA Global Healthcare No. 1 (5)	3,795,205	8.96%
Hongtao Investment-I Ltd (6)	2,980,132	7.25%
Directors and Named Executive Officers		
James Huang (2)	8,885,433	20.40%
John R. Leone (7)	50,060	*
Joseph M. Mahady (8)	50,029	*
Bruce A. Peacock (9)	50,146	*
Brian D. Schreiber, M.D.	20,000	*
Daniel E. Geffken	-	-
Craig Fraser (10)	502,430	1.21%
Steven G. Simonson, M.D. (11)	284,407	*
John A. Tattory (12)	279,493	*
Executive Officers and Directors as a group (10 persons)		
	10,268,518	**23.74%**

* Less than 1%

(1) Includes 66,900 shares of common stock and 66,900 Series A-1 Warrants to purchase 66,900 shares of common stock held directly by Lee's Pharmaceutical Holdings Limited, or Lee's, exercisable within 60 days of January 15, 2020, (ii) 4,008,234 shares of common stock, 307,859 Series F Warrants to purchase 307,859 shares of common stock exercisable within 60 days of January 15, 2020, 597,610 Series G Warrants to purchase 597,610 shares of common stock exercisable within 60 days of January 15, 2020, and 135,417 Series C warrants to purchase 135,417 shares of common stock exercisable within 60 days of January 15, 2020 held by LPH II Investments Limited, or LPH II , (iii) 8,063,861 shares of common stock held by China Cardiovascular Interest Limited, or China Cardiovascular, and (iv) 2,311,604 shares of common stock held by LPH Investments Ltd., or LPH. Lee's may be deemed to have beneficial ownership of the shares held by LPH II due to its ownership of 100% of LPH II and the shares of common stock held by China Cardiovascular may be deemed to be beneficially owned by Lee's by virtue of its 100% ownership of Pharmaceutical International Limited, which owns 100% of the equity interests of China Cardiovascular. Lee's holds a 74% interest in LPH and, accordingly, Lee's may be deemed to beneficially own the shares held by LPH. LPH II is currently unable to exercise the Series C, F and G warrants due to an ownership cap restriction and Lee's Series A-1 Warrants are subject to a 9.99% ownership cap. Other than for purposes of Rule 13d-3 of the Act, Lee's disclaims beneficial ownership of the shares of common stock and warrants, as applicable, except to the extent of its pecuniary interest therein, as applicable. Mses. Lee Siu Fong and Leelalertsuphakun Wanee are executive directors, Dr. Li Xiaoyi is an executive director and the chief executive officer, Mr. Simon Miles Ball is a non-executive director, and Drs. Chan Yau Ching (Bob) and Tsim Wah Keung (Carl) and Mr. Lam Yat Cheong are the independent directors, of Lee's, or the Lee's Directors. The Lee's Directors and the shareholders of Lee's have shared voting and investment power over the shares held by Lee's. The address for Lee's, LPH, LPH II and China Cardiovascular is 1/F, Building 20E, Phase 3, Hong Kong Science Park, Shatin, Hong Kong.

(2) Includes 6,182,974 shares of common stock, 187,500 shares of common stock issuable upon exercise of Series D Warrants exercisable within 60 days of January 15, 2020, 769,649 shares of common stock issuable upon exercise of Series F Warrants exercisable within 60 days of January 15, 2020 and 1,494,024 shares of common stock issuable upon exercise of Series G Warrants exercisable within 60 days of January 15, 2020 held by Panacea Venture Healthcare Fund I, L.P., or the Panacea Fund. Panacea Venture Healthcare Fund GP I, L.P. or the Immediate GP, is the general partner of the Panacea Fund, Panacea Venture Healthcare Fund GP Company, Ltd., or the Parent GP, is the general partner of the Immediate GP, and Panacea Venture Management Company Ltd., or the Management Company and together with the Panacea Fund, the Immediate GP and the Parent GP, the Panacea Entities, is the management company of the Immediate GP and together with Parent GP, and the Immediate GP may be deemed to have beneficial ownership over the shares of our common stock held by the Panacea Fund. Mr. Huang serves as a director of the Panacea Fund and may be deemed to beneficially own the shares held by the Panacea Fund. Mr. Huang expressly disclaims beneficial ownership of the securities reported herein, except to the extent of his pecuniary interest therein, if any. In addition, the Management Company holds 187,500 Series D Warrants to purchase 187,500 shares of our common stock exercisable within 60 days of January 15, 2020. The Panacea Entities may be deemed to constitute a “group” within the meaning of Section 13(d)(3) of the Exchange Act. Mr. Huang and Hai Mi serve as directors of the Parent GP and the Management Company. Mr. Huang, Hai Mi, and the shareholders of the Parent GP and Management Company have shared voting and investment power over the shares held by the Panacea Fund. The address of the Panacea Fund, Immediate GP, Parent GP and the Management Company is #6 Lane 1350 Middle Fuxing Rd., Xuhui District, Shanghai, China 200319.

(3) Includes 3,551,750 shares of common stock, 384,824 shares of common stock issuable upon exercise of Series F Warrants exercisable within 60 days of January 15, 2020 and 747,012 shares of common stock issuable upon exercise of Series G Warrants exercisable within 60 days of January 15, 2020 held by Bioengine Capital Inc. Center Laboratories, Inc. may be deemed to beneficially own the shares held by Bioengine Capital, Inc. by virtue of its 58.6% equity interest in Bioengine Capital Inc. Center Laboratories, Inc. and all the other shareholders and directors of Bioengine Capital Inc. have shared voting and investment power over the shares held by Bioengine Capital Inc. The address of Bioengine Capital and Center Laboratories, Inc. is 7F, No. 3-2 Park St., Nangang District, Taipei City 1 14 Taiwan, Republic of China.

(4) Includes 4,336,790 shares of common stock owned directly by Ivy Blue Holdings Limited, which is a wholly owned subsidiary of KPCB China Fund II, L.P. KPCB China Associates II, L.P. is the general partner of KPCB China Fund II, L.P. and KPCB China Holdings II, Ltd. is the general partner of KPCB China Associates II, L.P. The directors of KPCB China Holdings II, Ltd. are Brook Byers, Wen Hsieh, James Huang and Theodore Schlein, or the China Holdings Directors. By virtue of these relationships, Brook Byers, Wen Hsieh, James Huang and Theodore Schlein may be deemed to indirectly beneficially own the securities held by Ivy Blue Holdings Limited; however each disclaims beneficial ownership of such securities except to the extent of his pecuniary interest therein. The China Holdings Directors and all the shareholders of China Holdings II, Ltd. have shared voting and investment power over the shares held by Ivy Blue Holdings Limited. The address of Ivy Blue Holdings Limited, KPCB China Fund II, L.P., KPCB China Associates II, L.P. and KPCB China Holdings II, Ltd. is No 6 Lane 1350 Middle Fuxing Rd., Xuhui District, Shanghai, China 200319.

(5) Includes 2,530,137 shares of common stock, 430,123 Series F Warrants to purchase 430,123 shares of common stock exercisable within 60 days of January 15, 2020, and 834,945 Series G Warrants to purchase 834,945 shares of common stock exercisable within 60 days of January 15, 2020. The address of Tyrus-DA Global Healthcare No. 1 is #1901 Trade Tower, Yeongdongdaero 511 Gangam-Gu, Seoul, Korea 06164.

(6) The address of Hongtao Investment Ltd is Room B, 43/F, 2A Seymour Road, Azura, Hong Kong.

(7) Includes 16,212 shares of common stock, 179 Series A Warrants to purchase 179 shares of common stock exercisable within 60 days of January 15, 2020, 650 Series A-1 Warrants to purchase 650 shares of common stock exercisable within 60 days of January 15, 2020 and options to purchase 33,019 shares of common stock exercisable within 60 days of January 15, 2020.

(8) Includes 16,160 shares of common stock, 850 Series A-1 Warrants to purchase 850 shares of common stock exercisable within 60 days of January 15, 2020, and options to purchase 33,019 shares of common stock exercisable within 60 days of January 15, 2020.

(9) Includes 16,160 shares of common stock, 850 Series A-1 Warrants to purchase 850 shares of common stock exercisable within 60 days of January 15, 2020, and options to purchase 33,136 shares of common stock exercisable within 60 days of January 15, 2020.

(10) Includes 62,931 shares of common stock, 350 Series A-1 Warrants to purchase 350 shares of common stock exercisable within 60 days of January 15, 2020, and options to purchase 439,149 shares of common stock exercisable within 60 days of January 15, 2020.

(11) Includes 30,888 shares of common stock, 60 Series A Warrants to purchase 60 shares of common stock exercisable within 60 days of January 15, 2020, 150 Series A-1 Warrants to purchase 150 shares of common stock exercisable within 60 days of January 15, 2020 and options to purchase 253,309 shares of common stock exercisable within 60 days of January 15, 2020.

(12) Includes 26,635 shares of common stock, 30 Series A Warrants to purchase 30 shares of common stock exercisable within 60 days of January 15, 2020, and options to purchase 252,828 shares of common stock exercisable within 60 days of January 15, 2020.

DESCRIPTION OF CAPITAL STOCK

The following description of our capital stock and provisions of our Certificate of Incorporation, By-Laws and the Delaware General Corporation Law, or DGCL, are summaries and are qualified in their entirety by reference to the Certificate of Incorporation and the By-Laws

Pursuant to our Certificate of Incorporation, our authorized capital stock consists of 120,000,000 shares of common stock, par value $0.001 per share and 5,000,000 shares of preferred stock, par value $0.001 per share, to be designated from time to time by our Board.

Common Stock

As of December 31, 2019, there were 41,091,532 shares of our common stock issued and outstanding. Subject to any preferential rights of any preferred stock created by our Board, holders of our common stock are entitled to such dividends, if any, as our Board may declare from time to time out of funds that we can legally use to pay dividends.

Holders of our common stock are entitled to one vote for each share of common stock and do not have any right to cumulate votes in the election of directors. Upon our liquidation, dissolution or winding-up, holders of our common stock will be entitled to receive on a proportionate basis any assets remaining after provision for payment of creditors and after payment of any liquidation preferences to holders of preferred stock. Holders of our common stock have no preemptive rights and no conversion rights or other subscription rights. There are no redemption or sinking fund provisions applicable to our common stock. All the outstanding shares of common stock are, and the shares offered by this prospectus, when issued and paid for, will be, validly issued, fully paid and nonassessable. The rights and privileges of the holders of our common stock are subject to and may be adversely effected by the rights of the holders of shares of any series of preferred stock that we may issue.

Preferred Stock

Our Board may divide the preferred stock into any number of series, fix the designation and number of shares of each such series, and determine or change the designation, relative rights, preferences and limitations of any series of preferred stock. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring or preventing a change in our control and may adversely affect the market price of the common stock and the voting and other rights of the holders of our common stock.

Common Stock Warrants

December 2019 Private Placement Warrants

We issued to certain institutional investors in the December 2019 Private Placement our Series I Warrants to purchase up to 4,375,002 shares of our common stock, at an exercise price equal to $4.03 per share, or the Series I Warrant Shares. The Series I Warrants may be exercised on the six-month anniversary of the date of issuance and through the 5-year anniversary of the date of issuance. The Series I Warrants may be exercised for cash or on a cashless basis if there is no effective registration statement registering the resale of the Series I Warrant Shares and may not be exercised to the extent that the holder thereof would, following such exercise or conversion, beneficially own more than 4.99% (or such other percent as designated by each holder not to exceed 19.99%) of our outstanding shares of common stock. The Series I Warrants contain customary provisions that adjust the exercise price and the number of Series I Warrant Shares in the event of a corporate transaction.

December 2018 Private Placement Warrants

On December 21, 2018, we completed a private placement offering with select institutional investors for the purchase of an aggregate of 11,785,540 shares of our common stock. In connection with this financing, we issued (i) Series F Warrants to purchase an aggregate of 2,003,541 shares of common stock, at an exercise price equal to $3.68 per share, which are exercisable through the 18-month anniversary of the date of issuance, or the Series F Warrants, and (ii) Series G Warrants to purchase an aggregate of 3,889,229 shares of common stock, at an exercise price equal to $4.05 per share, which are exercisable through the 5-year anniversary of the date of issuance, or the Series G Warrants and, together with the Series F Warrants, the December 2018 Warrants. The December 2018 Warrants (i) may not be exercised to the extent that, following such exercise, the holder would beneficially own more than 9.99% (or other percent as designated by each holder) of our outstanding shares of common stock, and (ii) otherwise contain customary provisions that adjust the exercise price and the number of shares of common stock into which they may be exercised in the event of a corporate transaction.

AEROSURF Warrants (December 2018)

In connection with the CVie Acquisition, our Board declared a dividend to the holders of record of our outstanding shares of common stock, and holders of certain warrants to purchase common stock, that were outstanding on December 20, 2018 of 0.6148 Series H (AEROSURF) Warrant, for each share of common stock held by a shareholder or each warrant held by a warrant holder, as applicable, on the record date, or the AEROSURF Warrants. The Company expects to distribute AEROSURF Warrants that are exercisable for an aggregate of 2,963,167 shares of common stock. Each AEROSURF Warrant has a term of five years and provides for automatic exercise into one share of common stock, without any exercise price, upon the Company's public announcement of the dosing of the first human subject enrolled in the Company's Phase 3 clinical trial for AEROSURF.

Battelle Collaboration Agreement Warrants (October 2014 and December 2018)

We entered into the Battelle Collaboration Agreement with Battelle in October 2014, which was amended on August 2015 and March 2016, for the development of a new version, or NextGen, of our ADS. In connection with the Battelle Collaboration Agreement, on October 10, 2014, we issued to Battelle warrants to purchase 3,571 shares of common stock, exercisable at a price of $1,400.00 per share, which expire on October 10, 2024. In December 2018, we and Battelle entered into the Battelle Payment Restructuring, which reflected the terms of an October 2017 nonbinding memorandum of understanding, in which we outlined terms to restructure approximately $4.3 million then due to Battelle, under a Research and Development Services Agreement dated as of June 22, 2012 and the Battelle Collaboration Agreement. In connection with the Battelle Payment Restructuring, on December 11, 2018, we issued to Battelle warrants to purchase 75,000 shares of common stock, exercisable at a price of $6.50 per share, which expire on December 7, 2023.

Panacea Venture Management Company Ltd. Warrants (July 2018)

On July 2, 2018, we issued to Panacea Venture Management Company Ltd., or Panacea, a Secured Convertible Promissory Note, or the Panacea Note, with respect to a loan facility in the aggregate amount of up to $1.5 million, which was funded in two loans of $1.0 million on the date of the Panacea Note and $0.5 million on July 23, 2018. In connection with the Panacea Note, we issued to Panacea warrants, or the Series D Warrants, to purchase 187,500 shares, or the Series D Warrant Shares, at an exercise price of $4.00 per Series D Warrant Share, or the Exercise Price. The Series D Warrants may be exercised at any time beginning six months after the date of issuance and through the fifth anniversary of the date of issuance. The Series D Warrants may not be exercised to the extent that the holder thereof would, following such exercise, beneficially own more than 9.99% (or such other percent as designed by each holder) of the Company's outstanding shares of common stock, which percentage may be increased, decreased or waived by such holder upon sixty-one days' notice to us. The Series D Warrants also contain customary provisions that adjust the Exercise Price and the number of Series D Warrant Shares in the event of a corporate transaction.

LPH II Warrants (April 2018)

On March 30, 2018, LPH II invested $2.6 million in us and acquired 541,667 shares of common stock and 135,417 Series C Warrants to purchase 135,417 shares of common stock, at an exercise price of $5.52 per Series C Warrant Share. The Series C Warrants may be exercised at any time beginning six months after the date of issuance and through the seventh anniversary of the date of issuance. The Series C Warrants may be exercised for cash or on a cashless basis if there is no effective registration statement registering the resale of the Series C Warrant Shares and may not be exercised to the extent that the holder thereof would, following such exercise, beneficially own more than 9.99% (or such other percent as designated by each holder) of the Company's outstanding shares of common stock, which percentage may be increased, decreased or waived by such holder upon sixty-one days' notice to us. The Series C Warrants also contain customary provisions that adjust the Exercise Price and the number of Series C Warrant Shares in the event of a corporate transaction.

February 2017 Private Placement Warrants

On February 15, 2017, we completed a private placement offering of 7,049 Series A Convertible Preferred Stock units. Each unit consisted of: (i) one share of Series A Convertible Preferred Stock, par value $0.001 per share, or Preferred Shares; and (ii) 50 Series A-1 Warrants to purchase one share of common stock at an exercise price equal to $27.40 per share. The Series A-1 Warrants may be exercised at any time beginning six months after the date of issuance and through the seventh anniversary of the date of issuance. The Series A-1 Warrants may not be converted or exercised to the extent that the holder would, following such exercise or conversion, beneficially own more than 9.99% (or other lesser percent as designated by each holder) of our outstanding shares of common stock.

July 2015 Warrants

On July 22, 2015, we completed a registered public offering of 89,583 Series A units and 150,000 Series B units. Each Series A unit consisted of one share of common stock and a Series A warrant to purchase one share of common stock at an exercise price of $196.00 per share. Each Series B unit consisted of a fully paid pre-funded Series B warrant to purchase one share of common stock at an exercise price of $168.00 per share, and a Series B warrant to purchase one share of common stock at an exercise price of $196.00 per share. As of December 31, 2017, all pre-funded Series B warrants were exercised. The Series A and Series B warrants, collectively the July 2015 Warrants, are exercisable immediately through the seventh anniversary of the date of issuance. The July 2015 Warrants may not be exercised to the extent that the holder would, following such exercise, beneficially own more than 9.99% (or 4.99% as may be elected by each holder) of our outstanding shares of common stock.

Registration Rights

In connection with the private placement on December 6, 2019, certain holders of our securities are entitled to various rights with respect to registration of their shares under the Securities Act of 1933, as amended, or the Securities Act. These rights are provided under the terms of a registration rights agreement, between us and holders of our common stock and Series I Warrants. Under the registration rights agreement, we agreed to file a registration statement covering the shares of common stock with the SEC no later than the earlier of (i) four trading days following the date that we file our annual report on Form 10-K for the fiscal year ending December 31, 2019, or (ii) April 10, 2020.

We will pay all expenses in connection with any registration obligation provided in the registration rights agreement, including, without limitation, all registration, filing, stock exchange, printing expenses, all fees and expenses of complying with applicable securities laws, and the fees and disbursements of our counsel and independent accountants, and the reasonable fees and disbursements of counsel to the holders not to exceed $5,000 in the aggregate. Each investor will be responsible for its own sales commissions, if any.

Registration of these shares under the Securities Act would result in these shares becoming freely tradable without restriction under the Securities Act, except for shares purchased by affiliates, immediately upon the effectiveness of the registration statement of which this prospectus is a part. Any sales of securities by these stockholders could have a material adverse effect on the trading price of our common stock.

Anti-Takeover Effects of Delaware Law and our Certificate of Incorporation and By-Laws

Certificate of Incorporation and By-Laws

Because our stockholders do not have cumulative voting rights, our stockholders holding a majority of the voting power of our shares of common stock outstanding will be able to elect all of our directors. According to Section 242 of the DGCL and our By-Laws, the affirmative vote of holders of at least a majority of the voting power of all of the then outstanding shares of voting stock, voting as a single class, is required to amend certain provisions of our Certificate of Incorporation. Further, our By-Laws provide that stockholder actions may be effected at a duly called meeting of stockholders or by written consent.

Our By-Laws further provide the Board with the exclusive right to increase or decrease the size of the Board (not less than three), and with the right to elect directors to fill a vacancy created by the expansion of the Board or the resignation, death or removal of a director.

Section 203 of the Delaware General Corporation Law

As a corporation organized under the laws of the State of Delaware, we are subject to Section 203 of the DGCL, which restricts our ability to enter into business combinations with an interested stockholder, the owner of 15% or more of the corporation's voting stock, or an interested stockholder's affiliates or associates, for a period of three years after such person became an interested stockholder. These restrictions do not apply if:

- before becoming an interested stockholder, our Board approves either the business combination or the transaction in which the stockholder becomes an interested stockholder;
- upon consummation of the transaction in which the stockholder becomes an interested stockholder, the interested stockholder owns at least 85% of our voting stock outstanding at the time the transaction commenced, subject to exceptions; or
- on or after the date a stockholder becomes an interested stockholder, the business combination is both approved by our Board and authorized at an annual or special meeting of our stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock not owned by the interested stockholder.

Choice of Forum

Our Certificate of Incorporation provides that, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for: (i) any derivative action or proceeding brought on behalf of us; (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers to us or our stockholders; (iii) any action asserting a claim against us arising pursuant to any provision of the DGCL or Certificate of Incorporation or By-Laws; or (iv) any action asserting a claim against us governed by the internal affairs doctrine. The exclusive forum provision in our Certificate of Incorporation shall not apply to any actions or proceedings brought against us under the Securities Act or Exchange Act, whereby the U.S. District Court for the District of Delaware shall be the sole and exclusive forum.

Limitations on Liability and Indemnification Matters

Pursuant to our By-Laws, we indemnify our directors to the maximum extent permissible under the DGCL. In addition, we have entered into indemnity agreements with our officers and directors that provide, among other things, that we will indemnify them, under the circumstances and to the extent provided for therein, for expenses, damages, judgments, fines and settlements he or she may be required to pay in actions or proceedings to which he or she is or may be made a party by reason of his or her position as a director, officer, or other agent of ours, and otherwise to the fullest extent permitted under the DGCL and our By-Laws. These agreements were updated and re-executed in January 2016. In connection with the CVie Acquisition, Mr. Huang and Dr. Schreiber entered into a revised version of our indemnification agreement in December 2018.

These provisions may be held not to be enforceable for violations of the federal securities laws of the U.S..

Listing

Our common stock trades on the OTCQB tier of OTC Markets Group, Inc., under the symbol “WINT.” We have applied to list our common stock on Nasdaq under the trading symbol “WINT.” There can be no assurance given that such listing will be approved or that a trading market will develop for our shares of common stock.

Transfer Agent and Registrar

The transfer agent and registrar for common stock is Continental Stock Transfer and Trust Company.

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES TO NON-U.S. HOLDERS

The following discussion is a summary of the material U.S. federal income tax consequences to Non-U.S. Holders (as defined below) of the purchase, ownership and disposition of our common stock issued pursuant to this offering, but does not purport to be a complete analysis of all potential tax effects. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or non- U.S. tax laws are not discussed. This discussion is based on the U.S. Internal Revenue Code of 1986, as amended, or the Code, Treasury Regulations promulgated thereunder, judicial decisions, and published rulings and administrative pronouncements of the U.S. Internal Revenue Service, or the IRS, in each case in effect as of the date hereof. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a Non-U.S. Holder of our common stock. We have not sought and will not seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a contrary position to that discussed below regarding the tax consequences of the purchase, ownership and disposition of our common stock.

This discussion is limited to Non-U.S. Holders that hold our common stock as a "capital asset" within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences relevant to a Non- U.S. Holder's particular circumstances, including the impact of the Medicare contribution tax on net investment income. In addition, it does not address consequences relevant to Non-U.S. Holders subject to special rules, including, without limitation:

- U.S. expatriates and former citizens or long-term residents of the U.S.;
- persons subject to the alternative minimum tax;
- persons holding our common stock as part of a hedge, straddle or other risk reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies and other financial institutions;
- brokers, dealers or traders in securities;
- "controlled foreign corporations," "passive foreign investment companies" and corporations that accumulate earnings to avoid U.S. federal income tax;
- partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and investors therein);
- tax-exempt organizations or governmental organizations;
- persons deemed to sell our common stock under the constructive sale provisions of the Code;
- persons that elect to apply Section 1400Z-2 of the Code to gains recognized with respect to shares of our common stock;
- persons who hold or receive our common stock pursuant to the exercise of any employee stock option or otherwise as compensation;
- tax-qualified retirement plans;
- "qualified foreign pension funds" and entities all of the interests of which are held by qualified foreign pension funds; and
- persons subject to special tax accounting rules as a result of any item of gross income with respect to our common stock being taken into account in an applicable financial statement.

If an entity or arrangement treated as a partnership for U.S. federal income tax purposes holds our common stock, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership and certain determinations made at the partner level. Accordingly, partnerships holding our common stock and the partners in such partnerships should consult their tax advisors regarding the U.S. federal income tax consequences to them.

THIS DISCUSSION IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT TAX ADVICE. INVESTORS SHOULD CONSULT THEIR TAX ADVISORS WITH RESPECT TO THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AS WELL AS ANY TAX CONSEQUENCES OF THE PURCHASE, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK ARISING UNDER THE U.S. FEDERAL ESTATE OR GIFT TAX LAWS OR UNDER THE LAWS OF ANY STATE, LOCAL OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.

Definition of a Non-U.S. Holder

- For purposes of this discussion, a "Non-U.S. Holder" is any beneficial owner of our common stock that is neither a "U.S. person" nor an entity treated as a partnership for U.S. federal income tax purposes. A U.S. person is any person that, for U.S. federal income tax purposes, is or is treated as any of the following:
- an individual who is a citizen or resident of the U.S.;
- a corporation or entity treated as a corporation that is created or organized under the laws of the U.S., any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (i) is subject to the primary supervision of a U.S. court and the control of one or more "United States persons" (within the meaning of Section 7701(a)(30) of the Code), or (ii) has a valid election in effect to be treated as a U.S. person for U.S. federal income tax purposes.

Distributions

As described in the section titled "Dividend Policy," we do not currently intend to pay any cash dividends on our capital stock in the foreseeable future. However, if we make distributions of cash or other property on our common stock, such distributions will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Amounts not treated as dividends for U.S. federal income tax purposes will constitute a return of capital and first be applied against and reduce a Non-U.S. Holder's adjusted tax basis in its common stock, but not below zero. Any excess will be treated as capital gain and will be treated as described below under "—Sale or Other Taxable Disposition."

Subject to the discussions below on effectively connected income, backup withholding and the Foreign Account Tax Compliance Act, or FATCA, dividends paid to a Non-U.S. Holder of our common stock will be subject to U.S. federal withholding tax at a rate of 30% of the gross amount of the dividends (or such lower rate specified by an applicable income tax treaty, provided the Non-U.S. Holder furnishes a valid IRS Form W-8BEN or W-8BEN-E (or other applicable documentation) certifying qualification for the lower treaty rate). A Non-U.S. Holder that does not timely furnish the required documentation, but that qualifies for a reduced treaty rate, may obtain a refund of any excess amounts withheld by timely filing an appropriate claim for refund with the IRS. Non-U.S. Holders should consult their tax advisors regarding their entitlement to benefits under any applicable income tax treaty.

If dividends paid to a Non-U.S. Holder are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the U.S. (and, if required by an applicable income tax treaty, the Non-U.S. Holder maintains a permanent establishment or fixed base in the U.S. to which such dividends are attributable), the Non-U.S. Holder will be exempt from the U.S. federal withholding tax described above. To claim the exemption, the Non-U.S. Holder must furnish to the applicable withholding agent a valid IRS Form W-8ECI, certifying that the dividends are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the U.S..

Any such effectively connected dividends generally will be subject to U.S. federal income tax on a net income basis at the regular graduated rates applicable to U.S. persons (as defined in the Code). A Non-U.S. Holder that is a corporation also generally will be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on its effectively connected earnings and profits attributable to such dividends, as adjusted for certain items. Non-U.S. Holders should consult their tax advisors regarding any applicable tax treaties that may provide for different rules.

Any documentation provided to an applicable withholding agent may need to be updated in certain circumstances. The certification requirements described above also may require a Non-U.S. Holder to provide its U.S. taxpayer identification number.

Sale or Other Taxable Disposition

Subject to the discussions below regarding backup withholding and FATCA, a Non-U.S. Holder will not be subject to U.S. federal income tax on any gain realized upon the sale or other taxable disposition of our common stock unless:

- the gain is effectively connected with the Non-U.S. Holder's conduct of a trade or business within the U.S. (and, if required by an applicable income tax treaty, the Non-U.S. Holder maintains a permanent establishment or fixed base in the U.S. to which such gain is attributable);
- the Non-U.S. Holder is a nonresident alien individual present in the U.S. for 183 days or more during the taxable year of the disposition and certain other requirements are met; or
- our common stock constitutes a U.S. real property interest, or USRPI, by reason of our status as a U.S. real property holding corporation, or USRPHC, for U.S. federal income tax purposes.

Gain described in the first bullet point above generally will be subject to U.S. federal income tax on a net income basis at the regular graduated rates. A Non-U.S. Holder that is a corporation also generally will be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on its effectively connected earnings and profits attributable to such gain, as adjusted for certain items.

Gain described in the second bullet point above will be subject to U.S. federal income tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty), which may be offset by U.S. source capital losses of the Non-U.S. Holder (even though the individual is not considered a resident of the U.S.), provided the Non-U.S. Holder has timely filed U.S. federal income tax returns with respect to such losses.

With respect to the third bullet point above, we believe we currently are not, and do not anticipate becoming, a USRPHC. However, because the determination of whether we are a USRPHC depends on the fair market value of our USRPIs relative to the fair market value of our non-U.S. real property interests and our other business assets, there can be no assurance we currently are not a USRPHC or will not become one in the future. Even if we are or were to become a USRPHC, gain arising from the sale or other taxable disposition by a Non-U.S. Holder of our common stock will not be subject to U.S. federal income tax if our common stock is "regularly traded," as defined by applicable Treasury Regulations, on an established securities market, and such Non-U.S. Holder owned, actually and constructively, 5% or less of our common stock throughout the shorter of the five-year period ending on the date of the sale or other taxable disposition or the Non-U.S. Holder's holding period. If we are a USRPHC and either our common stock is not regularly traded on an established securities market or a Non-U.S. Holder holds more than 5% of our common stock, actually or constructively, during the applicable testing period, such Non-U.S. Holder will generally be taxed on any gain in the same manner as gain that is effectively connected with the conduct of a U.S. trade or business, except that the branch profits tax generally will not apply.

Non-U.S. Holders should consult their tax advisors regarding any applicable income tax treaties that may provide for different rules.

Information Reporting and Backup Withholding

Payments of dividends on our common stock will not be subject to backup withholding, provided the holder either certifies its non-U.S. status by furnishing a valid IRS Form W-8BEN, W-8BEN-E or W-8ECI or otherwise establishes an exemption. However, information returns are required to be filed with the IRS in connection with any dividends on our common stock paid to the Non-U.S. Holder, regardless of whether any tax was actually withheld. In addition, proceeds of the sale or other taxable disposition of our common stock within the U.S. or conducted through certain U.S.-related brokers generally will not be subject to backup withholding or information reporting, if the applicable withholding agent receives the certification described above or the holder otherwise establishes an exemption. Proceeds of a disposition of our common stock conducted through a non-U.S. office of a non-U.S. broker that does not have certain enumerated relationships with the U.S. generally will not be subject to backup withholding or information reporting.

Copies of information returns that are filed with the IRS also may be made available under the provisions of an applicable treaty or agreement to the tax authorities of the country in which the Non-U.S. Holder resides or is established.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a Non-U.S. Holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

Additional Withholding Tax on Payments Made to Foreign Accounts

Payments of dividends to a Non-U.S. Holder will be subject to a 30% withholding tax if the Non-U.S. Holder fails to provide the applicable withholding agent with documentation sufficient to show that it is compliant with FATCA. Generally such documentation is provided on an executed IRS Form W-8BEN or W-8BEN-E, as applicable. If dividends are subject to the 30% withholding tax under FATCA, they will not be subject to the 30% withholding described above under "Distributions."

While withholding under FATCA would have applied also to payments of gross proceeds from the sale or other disposition of our common stock on or after January 1, 2019, proposed Treasury Regulations eliminate FATCA withholding on payments of gross proceeds entirely. Taxpayers generally may rely on these proposed Treasury Regulations until final Treasury Regulations are issued.

Prospective investors should consult their tax advisors regarding the potential application of withholding under FATCA to their investment in our common stock.

PLAN OF DISTRIBUTION

We are registering 13,221,430 shares of common stock under this prospectus on behalf of the selling stockholders. The selling stockholders will pay any brokerage commissions and similar selling expenses attributable to the sale of the shares. We will not receive any of the proceeds from the sale of the shares by the selling stockholders. However, upon a cash exercise of the warrants by the selling stockholders, we will receive a per share exercise price of $4.03. If the warrants are exercised in a cashless exercise, we will not receive any proceeds from the exercise of the warrants.

Each selling stockholder of the securities and their transferees, pledgees, donees or assigns or other successors-in-interest may, from time to time, sell any or all of their securities covered hereby on the securities exchange or securities quotation service where the common stock is principally listed or quoted for trading or any other stock exchange, market or trading facility on which the securities are traded or in private transactions. These sales may be at fixed or negotiated prices. A selling stockholder may use any one or more of the following methods when selling securities:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the securities as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- settlement of short sales;
- in transactions through broker-dealers that agree with the selling stockholders to sell a specified number of such securities at a stipulated price per security;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The selling stockholders may also sell securities under Rule 144 or any other exemption from registration under the Securities Act, if available, rather than under this prospectus.

There is currently a limited public trading market for our common stock. Broker-dealers engaged by the selling stockholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the selling stockholders (or, if any broker-dealer acts as agent for the purchaser of securities, from the purchaser) in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction not in excess of a customary brokerage commission in compliance with FINRA Rule 2440; and in the case of a principal transaction a markup or markdown in compliance with FINRA IM-2440.

In connection with the sale of the securities or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the securities in the course of hedging the positions they assume. The selling stockholders may also sell securities short and deliver these securities to close out their short positions, or loan or pledge the securities to broker-dealers that in turn may sell these securities. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or create one or more derivative securities which require the delivery to such broker-dealer or other financial institution of securities offered by this prospectus, which securities such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The selling stockholders and any broker-dealers or agents that are involved in selling the securities may be deemed to be “underwriters” within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the securities purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Each selling stockholder has informed us that it does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the securities.

We are required to pay certain fees and expenses incurred by us incident to the registration of the securities. We have agreed to indemnify the selling stockholders against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

We agreed to keep this prospectus effective until the earlier of (i) the date on which the securities may be resold by the selling stockholders without registration and without regard to any volume or manner-of-sale limitations by reason of Rule 144, without the requirement for the Company to be in compliance with the current public information under Rule 144 under the Securities Act or any other rule of similar effect or (ii) all of the securities have been sold pursuant to this prospectus or Rule 144 under the Securities Act or any other rule of similar effect. The resale securities will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the resale securities covered hereby may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Under applicable rules and regulations under the Securities Exchange Act of 1934, as amended, or the Exchange Act, any person engaged in the distribution of the resale securities may not simultaneously engage in market making activities with respect to the common stock for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the selling stockholders will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of the common stock by the selling stockholders or any other person. We will make copies of this prospectus available to the selling stockholders and have informed them of the need to deliver a copy of this prospectus to each purchaser at or prior to the time of the sale (including by compliance with Rule 172 under the Securities Act).

LEGAL MATTERS

The validity of our common stock offered by this prospectus will be passed upon for us by Pepper Hamilton LLP, Philadelphia, Pennsylvania.

EXPERTS

Ernst & Young LLP, independent registered public accounting firm, has audited our consolidated financial statements at December 31, 2018 and 2017, and for each of the two years in the period ended December 31, 2018, as set forth in their report thereon (which contains an explanatory paragraph describing conditions that raise substantial doubt about the Company's ability to continue as a going concern as described in Note 4 to the consolidated financial statements) appearing elsewhere herein. We've included our financial statements in the prospectus and elsewhere in the registration statement in reliance on Ernst & Young LLP's report, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-1 (including the exhibits, schedules and amendments thereto) under the Securities Act to the shares of common stock being offered by the selling stockholders named in this prospectus. This prospectus does not contain all of the information set forth in the registration statement and the exhibits and schedules thereto. For further information with respect to us and the common stock offered by this prospectus, we refer you to the registration statement and the exhibits and schedules filed therewith. Where we make statements in this prospectus as to the contents of any contract or any other document, for the complete text of that document, we refer you to the copy of the contract or other document filed as an exhibit to the registration statement. Each of these statements is qualified in all respects by this reference.

A copy of the registration statement, and the exhibits and schedules thereto, may be inspected without charge at the public reference facilities maintained by the SEC at 100 F Street NE, Washington, D.C. 20549. Copies of these materials may be obtained, upon payment of a duplicating fee, from the Public Reference Section of the SEC at 100 F Street NE, Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the public reference facility. The SEC maintains a website that contains reports, proxy and information statements and other information regarding registrants that file electronically with the SEC. The address of the SEC's website is www.sec.gov.

We also make available free of charge on our website at www.windtreetx.com our Annual Reports on Form 10-K, our Quarterly Reports on Form 10-Q, our Current Reports on Form 8-K and any amendments to those reports, as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. Information contained on our website is not incorporated by reference into this prospectus and you should not consider information contained on our website as part of this prospectus.

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WINDTREE THERAPEUTICS, INC. AND SUBSIDIARIES

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Windtree Therapeutics, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Windtree Therapeutics, Inc. and subsidiaries (the Company) as of December 31, 2018 and 2017, the related statements of operations**,** changes in stockholders' equity and cash flows for each of the two years in the period ended December 31, 2018, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

The Company's Ability to Continue as a Going Concern

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 4 to the financial statements, the Company has suffered recurring losses and negative cash flows from operations, expects to incur losses and use cash in operations for the foreseeable future, and has stated that substantial doubt exists about the Company’s ability to continue as a going concern. Management's evaluation of the events and conditions and management’s plans regarding these matters are also described in Note 4. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

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

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

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

/s/ Ernst and Young LLP

We have served as the Company’s auditor since 2000.

Philadelphia, Pennsylvania
April 16, 2019

NEW SECTION

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARIES

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

	December 31, 2018	December 31, 2017
ASSETS		
Current Assets:		
Cash and cash equivalents	$ 11,187	$ 1,815
Available-for-sale marketable securities	13,959	-
Prepaid expenses and other current assets	507	422
Total current assets	25,653	2,237
Property and equipment, net	802	885
Restricted cash	171	225
Intangible assets	77,090	-
Goodwill	15,682	-
Total assets	$ 119,398	$ 3,347
LIABILITIES & STOCKHOLDERS' EQUITY		
Current Liabilities:		
Accounts payable	$ 3,420	$ 2,324
Collaboration and device development payable, net	2,576	4,418
Accrued expenses	6,465	4,134
Deferred revenue - current portion	198	884
Loan payable	7,974	-
Total current liabilities	20,633	11,760
Restructured debt liability - contingent milestone payments	15,000	15,000
Deferred revenue - non-current portion	-	407
Deferred tax liabilities	15,476	
Other liabilities	175	100
Total liabilities	51,284	27,267
Stockholders' Equity:		
Preferred stock, $0.001 par value; 5,000,000 shares authorized; 0 shares and 2,701 shares issued and outstanding at December 31, 2018 and December 31, 2017, respectively	-	-
Common stock, $0.001 par value; 120,000,000 shares authorized at December 31, 2018 and December 31, 2017; 32,133,263 and 3,227,495 shares issued at December 31, 2018 and December 31, 2017, respectively; 32,133,189 shares and 3,227,421 shares outstanding at December 31, 2018 and December 31, 2017, respectively	32	3
Additional paid-in capital	728,783	616,245
Accumulated deficit	(657,647)	(637,114)
Treasury stock (at cost); 74 shares	(3,054)	(3,054)
Total stockholders' equity	68,114	(23,920)
Total liabilities & stockholders' equity	$ 119,398	$ 3,347

See notes to consolidated financial statements

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARIES

Consolidated Statements of Operations
(in thousands, except per share data)

	Year Ended December 31,	
	2018	**2017**
Revenues:		
Grant revenue	$ 765	$ 1,383
License revenue with affiliate	1,023	102
Total revenues	1,788	1,485
Expenses:		
Research and development	10,562	17,376
General and administrative	7,421	6,657
Total operating expense	17,983	24,033
Operating loss	(16,195)	(22,548)
Other income / (expense):		
Net loss on debt extinguishment	(3,345)	-
Gain on debt restructuring	-	5,824
Interest income	15	12
Interest expense	(1,409)	(1,863)
Other income, net	401	129
Other income / (expense), net	(4,338)	4,102
Net loss	$ (20,533)	$ (18,446)
AEROSURF warrant dividend	(12,505)	-
Deemed dividend on Series A preferred stock	(1,718)	(6,370)
Net loss attributable to common shareholders	$ (34,756)	$ (24,816)
Net loss per common share		
Basic and diluted	$ (7.74)	$ (24.14)
Weighted average number of common shares outstanding		
Basic and diluted	4,493	1,028

See notes to consolidated financial statements

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARIES

Consolidated Statements of Changes in Stockholders' Equity
(in thousands)

	Preferred Stock		Common Stock				Treasury Stock		
	Shares	Amount	Shares	Amount	Additional Paid-in Capital	Accumulated Deficit	Shares	Amount	Total
Balance - December 31, 2016	**-**	**$ -**	**436**	**$ -**	**$ 592,892**	**$ (618,668)**	**-**	**$ (3,054)**	**$ (28,830)**
Net Loss			-	-	-	(18,446)	-	-	(18,446)
Issuance of preferred stock, February 2017 Private Placement	7	-	-	-	10,433	-	-	-	10,433
Preferred stock conversions	(4)	-	217	-	(2)	-	-	-	(2)
Issuance of common stock, ATM Program	-	-	42	-	1,030	-	-	-	1,030
Issuance of common stock, Share Purchase Agreement	-	-	2,312	2	9,969	-	-	-	9,971
Issuance of common stock, 401(k) plan employer match	-	-	7	-	95	-	-	-	95
Issuance of common stock, equity consideration in debt restructuring	-	-	71	-	267	-	-	-	267
Exercise of prefunded common stock warrants	-	-	142	-	-	-	-	-	-
Stock-based compensation expense		-	-	1	1,561	-	-	-	1,562
Balance - December 31, 2017	**3**	**$ -**	**3,227**	**$ 3**	**$ 616,245**	**$ (637,114)**	**-**	**$ (3,054)**	**$ (23,920)**
Net Loss			-	-	-	(20,533)	-	-	(20,533)
Preferred stock conversions	(3)	-	135	-	-	-	-	-	-
Issuance of common stock, Share Purchase Agreement, April 2018	-	-	542	1	2,540	-	-	-	2,541
Issuance of common stock and warrants, Share Purchase Agreement, December 2018, net of issuance costs	-	-	11,786	12	41,101	-	-	-	41,113
Issuance of common stock, placement agent	-	-	114	-	-	-	-	-	-
Issuance of common stock, CVie Acquisition	-	-	16,265	16	67,484	-	-	-	67,500
Vesting of restricted stock units	-	-	95	-		-	-	-	-
Withholding tax payments related to net share settlements of restricted stock units	-	-	(31)	-	(155)	-	-	-	(155)
Issuance of warrants, equity consideration in debt issuance	-	-	-	-	417	-	-	-	417
Issuance of warrants, equity consideration in payable restructuring	-	-	-	-	196	-	-	-	196
Stock-based compensation expense	-	-	-	-	955	-	-	-	955
Balance - December 31, 2018	**-**	**$ -**	**32,133**	**$ 32**	**$ 728,783**	**$ (657,647)**	**-**	**$ (3,054)**	**$ 68,114**

See notes to consolidated financial statements

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARIES

Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31	
	2018	**2017**
Cash flows from operating activities:		
Net loss	$ (20,533)	$ (18,446)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation	160	192
Amortization of debt discount	863	-
Stock-based compensation	955	1,655
Amortization of prepaid interest	-	912
Net loss on extinguishment of debt	3,345	
Gain on debt restructuring	-	(5,824)
Gain on sale of equipment	(9)	
Changes in:		
Prepaid expenses and other current assets	302	90
Accounts payable	997	2,433
Collaboration and device development payable	(510)	(343)
Accrued expenses	(276)	(2,995)
Deferred revenue - current	(686)	884
Deferred revenue - non-current	(407)	407
Other liabilities	18	(10)
Net cash used in operating activities	(15,781)	(21,045)
Cash flows from investing activities:		
Cash acquired in CVie acquisition	223	-
Purchase of marketable securities	(13,959)	-
Proceeds from sale of property and equipment	9	-
Purchase of property and equipment	-	(24)
Net cash used in investing activities	(13,727)	(24)
Cash flows from financing activities:		
Proceeds from private placement issuance of securities, net of expenses	32,893	14,860
Proceeds from loan payable, net of expenses	6,160	3,900
Repayment of loan payable	(160)	-
Proceeds from convertible note payable	1,500	-
Repayment of convertible note payable	(1,500)	-
Payment for taxes related to net share settlements of restricted stock units	(155)	-
Proceeds from ATM Program, net of expenses	-	1,036
Principal payments on debt restructuring	-	(2,500)
Net cash provided by financing activities	38,738	17,296
Effect of exchange rates on cash	88	-
Net increase/(decrease) in cash, cash equivalents and restricted cash	9,318	(3,773)
Cash, cash equivalents and restricted cash - beginning of year	2,040	5,813
Cash, cash equivalents and restricted cash - end of year	$ 11,358	$ 2,040
Supplementary disclosure of cash flows information:		
Interest paid	$ 288	$ 1,088

See notes to consolidated financial statements

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARY

Note 1 – The Company and Description of Business

Windtree Therapeutics, Inc. (referred to as "we," "us," or the "Company") is a biotechnology and medical device company focused on developing drug product candidates and medical device technologies to address acute pulmonary and cardiovascular diseases. Historically, our focus has been on the development of our proprietary KL4 surfactant technology and aerosol delivery system (ADS) technology for the treatment and or prevention of respiratory distress syndrome (RDS) in premature infants. Following our merger with CVie Investments Limited in December 2018 (*see*, Note 3 – Business Combination), we are also focusing on therapies for acute heart failure and hypertension and associated organ dysfunction.

Our four lead development programs are (1) istaroxime for treatment of acute decompensated heart failure (ADHF), (2) AEROSURF® (lucinactant for inhalation) for non-invasive delivery of our lyophilized KL4 surfactant to treat RDS in premature infants, (3) lyophilized KL4 surfactant intratracheal suspension for RDS, and (4) rostafuroxin for genetically associated hypertension.

Heart failure is a chronic, progressive disease resulting from structural or functional cardiac abnormalities and is characterized by inadequate pumping function of the heart that results in fluid accumulation manifesting as pulmonary congestion, peripheral edema and congestion in other parts of the body. Insufficient cardiac output can result in inadequate peripheral perfusion that increases the risk of other organ dysfunction such as renal failure. Heart failure commonly but episodically worsens to a point of decompensation, a condition called ADHF. We are developing istaroxime for the treatment of ADHF. Istaroxime has a dual mechanism of action referred to as luso-inotropic, that may result in improvement in cardiac function to reduce congestion and edema and preserve other organ function while avoiding the side effects associated with other classes of heart failure therapies. Istaroxime has been evaluated in two phase 2 clinical trials, the results of which suggest that istaroxime may improve cardiovascular physiology as assessed by parameters of pump function, decreases in pulmonary capillary wedge pressure, decreases in heart rate, increases in blood pressure without adverse events such as arrhythmias, cardiac damage (as indicated by elevated troponin values) or adverse impact on kidney function. Based on preclinical and clinical studies performed to date, we believe that istaroxime, if approved, could potentially improve patients' heart failure symptoms and reduce complications and the length of hospital stays when compared to current therapeutic regimens for ADHF. In 2019, we plan to work with heart failure experts to review the program and engage with the FDA and regulators in the EU to determine next steps in clinical development for this potential novel therapy for ADHF.

AEROSURF (lucinactant for inhalation) is an investigational combination drug/device product that we are developing to improve the management of RDS in premature infants who may not have fully developed natural lung surfactant and may require surfactant therapy to sustain life. Surfactants in the US are animal-derived and must be administered using endotracheal intubation, frequently with mechanical ventilation, invasive procedures that may result in serious respiratory conditions and other complications. AEROSURF is designed to deliver aerosolized KL4 surfactant noninvasively using our proprietary aerosol delivery systems (ADS) technology, without invasive procedures. In 2017, we completed a phase 2b clinical trial, which based on the planned top-line results, did not meet the primary endpoint of reduction in nCPAP failure at 72 hours, due in large part, we believe, to an unexpected rate of treatment interruptions, which occurred in about 24% of active enrollments, predominantly in the 50-minute dose group. We believe the interruptions were primarily related to certain of the prototype phase 2 ADS with specific lots of disposable cartridge filters that had a higher tendency to clog. After excluding patients in the 50-minute dose group whose dose was interrupted, in accordance with the predesignated statistical plan, we observed a meaningful treatment effect in line with our desired targeted outcome. The overall data suggest that the safety and tolerability profile of AEROSURF was generally comparable to the control group. Reported adverse events and serious adverse events were those that are common and expected among premature infants with RDS and comparable to the control group. As a result of these events, in 2019, we are planning to initiate an additional AEROSURF clinical bridging study that is designed, among other things, to clinically evaluate the design and performance of our new phase 3 ADS. This trial will not be powered to establish statistical significance but will generate additional higher dose treatment data to augment the higher dose data obtained in the phase 2b clinical trial. We believe that AEROSURF, if approved, has the potential to reduce the number of premature infants who are subjected to invasive surfactant administration, and potentially provide transformative clinical and pharmacoeconomic benefits. The FDA has granted Fast Track designation for our KL4 surfactant (including AEROSURF) to treat RDS.

We are also assessing potential development pathways to secure marketing approval for lyophilized KL4 surfactant as an intratracheal instillate for the treatment and/or prevention of RDS. Lyophilized KL4 surfactant is the drug product component of AEROSURF and a lyophilized dosage form of a liquid KL4 surfactant that was approved by the FDA in 2012 (SURFAXIN®). We previously discussed with the FDA a potential approach and plan potentially to re-engage with the FDA in the second half of 2019. If we can define an acceptable development plan that is achievable from a cost, timing and resource perspective, we may seek approval to treat premature infants who, because they are unable to breathe on their own or other reason, are not candidates for AEROSURF.

We also believe that our lyophilized KL4 surfactant may potentially support a product pipeline to address a broad range of serious respiratory conditions in children and adults. We are pursuing a number of early exploratory research efforts to identify potential product candidates, including a collaboration with Eleison Pharmaceuticals, Inc., a specialty pharmaceutical company developing life-saving therapeutics for rare cancers, to assess the feasibility of using our ADS potentially to deliver Eleison's inhaled lipid cisplatin (ILC), and with support from the National Institutes of Health (NIH), to address respiratory conditions.

Our fourth product candidate is rostafuroxin for the treatment of genetically associated hypertension. Rostafuroxin targets resistant hypertensive patients with a specific genetic profile, which is found in approximately 20% – 25% of the adult hypertensive population. We believe that rostafuroxin may reduce or normalize blood pressure in this genetically identified subset of patients and may reduce the risk of hypertension-related sequelae beyond the level normally associated with the absolute reduction of blood pressure, per se, because the molecular mechanism blocked by rostafuroxin may also be involved in organ damage. CVie Therapeutics completed three clinical trials assessing rostafuroxin, including a phase 2b clinical trial which was conducted in two parts, one in Caucasian patients in Italy and one in Chinese patients in Taiwan. While the blood pressure reduction in Caucasians was notable, there was no blood pressure response in Chinese patients. We are analyzing the results of these studies potentially to understand the reasons for the limited response in Chinese patients. In 2019, we plan to focus on finalizing the drug formulation and defining drug product analytical methods. We then to engage in business development activities potentially to out-license rostafuroxin to a larger company that has interest in and/or operates in the very large and broad antihypertension market.

The reader is referred to, and encouraged to read in its entirety, “Item 1 – Business – Company Overview” in this Annual Report on Form 10-K, which contains a discussion of our business and business plans, as well as information concerning our proprietary technologies and our current and planned development programs.

Note 2 – Basis of Presentation

The consolidated financial statements are prepared in accordance with accounting principles generally accepted in the US (US GAAP) and include accounts of Windtree and its wholly-owned subsidiaries. Intercompany balances and transactions have been eliminated in consolidation. In the opinion of management, all adjustments (consisting of normally recurring accruals) considered for fair presentation have been included. When necessary, prior year’s consolidated financial statements have been reclassified to conform to the current year presentation.

Note 3 – Business Combination

On December 21, 2018 (the Acquisition Date), we completed the acquisition of all the capital stock of CVie Investments Limited (CVie Investments), an exempted company with limited liability incorporated under the laws of the Cayman Islands, by issuing 16,256,060 shares of its common stock (CVie Acquisition). The preliminary purchase price for the CVie Acquisition was approximately $67.5 million. We plan to operate CVie and its wholly-owned subsidiary, CVie Therapeutics Limited (CVie Therapeutics, and together with CVie Investments, CVie), a Taiwan corporation organized under the laws of the Republic of China and CVie Investments' operating company, as a business division focused on development of drug product candidates in cardiovascular diseases. The CVie Acquisition was undertaken as part of a strategic initiative to create stockholder value and resulted from a multi-year process focused on identifying strategic opportunities, including potential strategic alliances, collaborations (primarily outside the United States), joint development opportunities, acquisitions, technology licensing arrangements, as well as potential combinations (including by merger or acquisition) or other corporate transactions.

In connection with the CVie Acquisition, our board of directors declared a dividend to the holders of record of outstanding shares of common stock, and holders of certain warrants to purchase common stock, that were outstanding on December 20, 2018 of 0.6148 Series H AEROSURF Warrant, for each share of common stock held by a shareholder or each warrant held by a warrant holder, as applicable, on the record date (AEROSURF Warrants). The AEROSURF Warrants are exercisable for an aggregate of 2,963,167 shares of common stock. Each AEROSURF Warrant has a term of five years and provides for automatic exercise into one share of common stock, without any exercise price, upon our public announcement of the dosing of the first human subject enrolled in our phase 3 clinical trial for AEROSURF. The AEROSURF Warrants are derivatives that qualify for an exemption from liability accounting as provided for in ASC Topic 815, Derivatives and Hedging – Contracts in Entity’s own Equity, and have been classified as equity. The $12.5 million fair value at issuance of the AEROSURF Warrants was determined using the Black-Scholes option-pricing model. The input assumptions used in the valuation are the historical volatility of our common stock price, the expected term of the warrants of two and a half years based on the expected date of the first human subject enrollment in our phase 3 clinical trial for AEROSURF, and the risk-free interest rate based on the average two-year and three-year treasury bill rate in effect at the measurement date.

Significant Input Assumptions of Warrant Valuation	
Historical volatility	116%
Expected term (in years)	2.5
Risk-free interest rate	2.62%

On the Acquisition Date, we entered into an indemnification letter agreement (the Indemnification Letter Agreement) with Lee’s Pharmaceutical Holdings Limited (Lee’s), pursuant to which Lee’s agreed to indemnify the holders of issued and outstanding shares of common stock on December 20, 2018 (the Indemnitees) for any loss, liability, damage or expense, including reasonable attorney’s fees and expenses incurred by us in connection with or, as a result of, any material inaccuracy in any representation or warranty made by CVie in the Merger Agreement (notwithstanding that the representations and warranties made by CVie do not survive after the closing of the merger). To secure Lee’s performance of this indemnity obligation, 984,000 of the shares issued to Lee’s affiliate in the Merger are being placed in escrow with our transfer agent, Continental Stock Transfer & Trust Company for one year. A portion of the escrowed shares will be transferred to the Indemnitees as the sole and exclusive remedy for a successful indemnity claim.

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARY

The aggregate purchase price has been allocated based on the fair value of assets acquired and liabilities assumed as of the acquisition date. The excess of the $67.5 million acquisition consideration over the acquired net assets was recorded as goodwill. The goodwill recorded is not deductible for tax purposes. The following table summarizes the initial allocation of the purchase price to the estimated fair value of the net assets acquired and liabilities assumed.

(in thousands)		
Cash and cash equivalents	$	193
Restricted cash		31
Prepaid expenses and other current assets		387
Property and equipment, net		76
Intangible assets		77,090
Total identifiable assets acquired	$	77,777
Current liabilities	$	(2,590)
Loan payable, current		(3,453)
Loan payable, non current		(4,491)
Deferred tax liabilities, noncurrent		(15,418)
Other liabilities, noncurrent		(7)
Net identifiable assets acquired		51,818
Goodwill		15,682
Net assets acquired	$	67,500

The acquired identifiable intangible assets consist of in-process research and development ("IPR&D") of approximately $77.1 million with an indefinite useful life. *See*, Note 5 for further discussion.

From the Acquisition Date to December 31, 2018, we recorded net loss from the CVie Acquisition of approximately $0.5 million.

The following table presents unaudited consolidated pro forma results of operations based on our historical financial statements and adjusted for the acquisition of CVie as if it occurred on January 1, 2017. The unaudited pro forma amounts were prepared for comparative purposes only and are not indicative of what actual consolidated results of our operations would have been, nor are they indicative of the consolidated results of operations in the future.

	Year Ended December 31,	
(in thousands, except per share data)	**2018**	**2017**
Pro forma net loss attributable to common shareholders	$ (38,082)	$ (34,616)
Pro forma EPS - basic and diluted	$ (1.20)	$ (1.19)

For the year ended December 31, 2018, net loss excludes the impact of transaction costs related to the CVie Acquisition. For the years ended December 31, 2018 and 2017, net loss excludes the impact of interest expense related to liabilities that were converted into common stock as part of the private placement.

Note 4 – Liquidity Risks and Management's Plans

As of December 31, 2018, we had cash and cash equivalents of $11.2 million and available-for-sale, marketable securities of $14.0 million, current liabilities of $20.6 million, including $8.0 million of Loan payable (*see*, Note 11 - Loan Payable). As of April 5, 2019, we believe that we have sufficient resources (including marketable securities) available to support our development activities, business operations and debt service through October 2019.

Although we believe that the December 2018 CVie Acquisition and $39 million Private Placement Financing have improved our financial position and may better position us to raise the capital needed to fund our business plans, we expect to continue to incur significant losses and require significant additional capital to advance our istaroxime and AEROSURF clinical development programs, support our operations and business development efforts, and satisfy our obligations beyond October 2019, and we do not have sufficient cash and cash equivalents for at least the next year following the date that the financial statements are issued. These conditions raise substantial doubt about our ability to continue as a going concern within one year after the date that the financial statements are issued.

To alleviate the conditions that raise substantial doubt about our ability to continue as a going concern, management plans to raise additional capital through a combination of public or private equity offerings and strategic transactions, including but not limited to potential alliances and collaborations focused on various individual markets; however, none of these alternatives are committed at this time. There can be no assurance that we will be able to complete any public or private equity offerings on acceptable terms, or in amounts required to support our operations, if at all, or identify and enter into any strategic transactions that will bring the capital that we will require. If none of these alternatives is available, or if available, we are unable to raise sufficient capital through such transactions, we will not have sufficient cash resources and liquidity to fund our business operations for at least the next year following the date that the financial statements are issued. Accordingly, management has concluded that substantial doubt exists with respect to our ability to continue as a going concern through one year after the issuance of the accompanying financial statements.

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARY

The accompanying financial statements have been prepared on a going concern basis, which contemplates the realization of assets and satisfaction of liabilities in the normal course of business, and do not include any adjustments relating to recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might be necessary should we be unable to continue as a going concern.

As of December 31, 2018, there were 120 million shares of common stock and 5 million shares of preferred stock authorized under our Certificate of Incorporation, and approximately 72.0 million shares of common stock and 5.0 million shares of preferred stock available for issuance and not otherwise reserved.

Note 5 – Accounting Policies and Recent Accounting Pronouncements

Principles of consolidation

The consolidated financial statements are prepared in accordance with accounting principles generally accepted in the US (US GAAP) and include accounts of Windtree Therapeutics, Inc. and its wholly-owned subsidiaries, CVie Investments Limited and its wholly-owned subsidiary, CVie Therapeutics Limited; and a presently inactive subsidiary, Discovery Laboratories, Inc. (formerly known as Acute Therapeutics, Inc.).

Business combinations

We follow the acquisition method for an acquisition of a business where the purchase price is allocated to the assets acquired and liabilities assumed based on their estimated fair values at the dates of acquisition. The excess of the fair value of purchase consideration over the fair value the assets acquired and liabilities assumed is recorded as goodwill. Such valuations require management to make significant estimates and assumptions, especially with respect to intangible assets. Management's estimate of fair value is based upon assumptions believed to be reasonable, but which are inherently uncertain and unpredictable and as such, actual results may differ materially from estimates.

Goodwill and intangible assets

We record acquired identified intangibles, which includes intangible assets (such as goodwill and other intangibles), based on estimated fair value. The acquired in-process research and development ("IPR&D") assets are considered indefinite-lived intangible assets until completion or abandonment of the associated research and development efforts. IPR&D is not amortized but reviewed for impairment at least annually, or when events or changes in the business environment indicate the carrying value may be impaired. The following table represents identifiable intangible assets as of December 31, 2018:

(in thousands)		**Estimated Fair Value**
Istaroxime drug candidate	$	22,340
Rostafuroxin drug candidate		54,750
Total	$	77,090

Goodwill represents the excess of the purchase price over the fair value assets acquired and liabilities assumed in a business combination and is not amortized. We perform an annual impairment test for goodwill and evaluates the recoverability whenever events or changes in circumstances indicate that the carrying value of goodwill may not be fully recoverable. In making such assessment, qualitative factors are used to determine whether it is more likely than not that our fair value is less than our carrying value. If the estimated fair value is less than our carrying value, then an impairment loss is recorded.

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARY

Foreign currency transactions

The functional currency for our foreign subsidiaries is US Dollars. We remeasure monetary assets and liabilities that are not denominated in the functional currency at exchange rates in effect at the end of each period. Gains and losses from the remeasurement of foreign currency transactions are recognized in other income (expense). Foreign currency transactions resulted in losses of approximately $0.1 million for the year ended December 31, 2018. There were no foreign currency transaction gains or losses for the year ended December 31, 2017.

Use of estimates

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

Cash and cash equivalents

Cash and cash equivalents are held in at domestic and foreign financial institutions and consist of liquid investments and money market funds with a maturity from date of purchase of 90 days or less that are readily convertible into cash.

Marketable securities

Marketable securities consist of investments in US Treasury securities. Management determines the appropriate classification of these securities at the time they are acquired and evaluates the appropriateness of such classifications at each balance sheet date. We classify investments as available-for-sale pursuant to Financial Accounting Standards Board (“FASB”) Accounting Standard Codification (“ASC”) 320, Investments—Debt and Equity Securities. Investments are recorded at fair value, with unrealized gains and losses included as a component of accumulated other comprehensive loss in stockholders’ equity and a component of total comprehensive loss in the consolidated statements of comprehensive loss, until realized. Realized gains and losses are included in investment income on a specific-identification basis. There were no realized gains or losses on marketable securities for the years ended December 31, 2018 and 2017. There were no unrealized gains or losses on investments for the years ended December 31, 2018 and 2017.

We review investments for other-than-temporary impairment whenever the fair value of an investment is less than the amortized cost and evidence indicates that an investment’s carrying amount is not recoverable within a reasonable period of time. Other-than-temporary impairments of investments are recognized in the consolidated statements of operations if we have experienced a credit loss, have the intent to sell the investment, or if it is more likely than not that we will be required to sell the investment before recovery of the amortized cost basis. Evidence considered in this assessment includes reasons for the impairment, compliance with our investment policy, the severity and the duration of the impairment and changes in value subsequent to the end of the period.

Available-for-sale marketable securities are classified as marketable securities, current or marketable securities, non-current depending on the contractual maturity date of the individual available-for-sale security.

Fair value of financial instruments

Our financial instruments consist principally of cash and cash equivalents and restricted cash. The fair values of our cash equivalents are based on quoted market prices. The carrying amount of cash equivalents is equal to their respective fair values at December 31, 2018 and 2017, respectively. We determine the fair value of marketable securities on quoted market prices or other relevant information generated by market transactions involving identical or comparable assets. Accounts payable and accrued expenses are carried at cost, which approximates fair value because of their short maturity. The carrying amount of loan payable (including current installments) approximates fair value based on a comparison of interest rates on the loan to current market rates considering our credit risk.

Property and equipment

Property and equipment are recorded at cost and depreciated using the straight-line method over the estimated useful lives of the assets (generally three to ten years). Leasehold improvements are amortized over the shorter of the estimated useful lives or the remaining term of the lease. Repairs and maintenance costs are charged to expense as incurred.

Restricted cash

Restricted cash consists principally of a $140,000 certificate of deposit held by our bank as collateral for a letter of credit in the same notional amount held by our landlord to secure our obligations under our Lease Agreement dated May 26, 2004 for our headquarters location in Warrington, Pennsylvania and $31,000 in deposits held by our landlord for our offices in Taipei, Taiwan, the former headquarters of CVie Therapeutics (*see,* – Note 18 – Commitments, for further discussion on our leases).

Long-lived assets

Our long-lived assets, primarily consisting of intangible assets, are reviewed for impairment when events or changes in circumstances indicate the carrying amount of an asset may not be recoverable, or its estimated useful life has changed significantly. When the undiscounted cash flows of an asset are less than its carrying value, an impairment is recorded and the asset is written down to estimated value. No impairment was recorded during the years ended December 31, 2018 and 2017 as management believes there are no circumstances that indicate the carrying amount of the assets will not be recoverable.

Collaborative arrangements

We account for collaborative arrangements in accordance with applicable accounting guidance provided in ASC Topic 808, *Collaborative Arrangements*. *See*, – Note 16 – Collaboration, Licensing and Research Funding Agreements.

Restructured debt liability – contingent milestone payment

In conjunction with the November 2017 restructuring and retirement of long-term debt (*see*, – Note 13 – Restructured debt liability), we have established a $15 million long-term liability for contingent milestone payments potentially due under the Exchange and Termination Agreement dated as of October 27, 2017 (Exchange and Termination Agreement), between ourselves and affiliates of Deerfield Management Company L.P. (Deerfield). The liability has been recorded at full value of the contingent milestones and will continue to be carried at full value until the milestones are achieved and paid or milestones are not achieved and the liability is written off as a gain on debt restructuring.

Deferred revenue

Deferred revenue represents amounts received prior to satisfying the revenue recognition criteria (*see*, Revenue recognition) and are recognized as deferred revenue in our balance sheet. Amounts expected to be recognized as revenue within the 12 months following the balance sheet date are classified as Deferred revenue – current portion. Amounts not expected to be recognized as revenue within the 12 months following the balance sheet date are classified as Deferred revenue – non-current portion.

Deferred revenue primarily consists of amounts related to an upfront license fee received in July 2017 in connection with the License Agreement with Lee's. The revenue will be recognized as our performance obligations under the contract are met (*see*, Note 16 – Collaboration and Device Development Payment Restructuring, Licensing and Research Funding Agreements).

Revenue recognition

Effective January 1, 2018, we adopted Accounting Standards Codification ("ASC") Topic 606, Revenue from Contracts with Customers, using the modified retrospective transition method. Under this method, we recognize the cumulative effect of initially adopting ASC Topic 606, if any, as an adjustment to the opening balance of retained earnings. Additionally, under this method of adoption, we apply the guidance to all incomplete contracts in scope as of the date of initial application. This standard applies to all contracts with customers, except for contracts that are within the scope of other standards, such as leases, insurance, collaboration arrangements and financial instruments.

In accordance with ASC Topic 606, we recognize revenue when the customer obtains control of promised goods or services, in an amount that reflects the consideration which we expect to receive in exchange for those goods or services. To determine revenue recognition for arrangements that we determine are within the scope of ASC Topic 606, we perform the following five steps:

(i) identify the contract(s) with a customer;

(ii) identify the performance obligations in the contract;

(iii) determine the transaction price;

(iv) allocate the transaction price to the performance obligations in the contract; and

(v) recognize revenue when (or as) the entity satisfies a performance obligation.

We only apply the five-step model to contracts when we determine that it is probable that we will collect the consideration we are entitled to in exchange for the goods or services we transfer to the customer. At contract inception, once the contract is determined to be within the scope of ASC Topic 606, we assess the goods or services promised within a contract and determine those that are performance obligations, and assesses whether each promised good or service is distinct. We then recognize as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

We have concluded that our government grants are not within the scope of ASC Topic 606 as they do not meet the definition of a contract with a customer. We have concluded that the grants meet the definition of a contribution and are non-reciprocal transactions, and have also concluded that Subtopic 958-605, Not-for-Profit-Entities-Revenue Recognition does not apply, as we are a business entity and the grants are with governmental agencies.

In the absence of applicable guidance under US GAAP, effective January 1, 2018, we developed a policy for the recognition of grant revenue when the related costs are incurred and the right to payment is realized.

We believe this policy is consistent with the overarching premise in ASC Topic 606, to ensure that revenue recognition reflects the transfer of promised goods or services to customers in an amount that reflects the consideration that we expect to be entitled to in exchange for those goods or services, even though there is no exchange as defined in ASC Topic 606. We believe the recognition of revenue as costs are incurred and amounts become realizable is analogous to the concept of transfer of control of a service over time under ASC Topic 606.

Prior to January 1, 2018, we recognized revenue as related costs were incurred under the grants given that persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed and determinable, and collectability is reasonably assured. Recognized amounts reflected our performance under the grants and equal direct and indirect costs incurred. Revenue and expenses under these arrangements were presented gross. Revenue recognition under this new policy is not materially different than would have been calculated under the old guidance. As a result of the adoption of this policy, there was no change to the amounts we have historically recorded in our financial statements.

Research and development

We account for research and development expense by the following categories: (a) product development and manufacturing, (b) medical and regulatory operations, and (c) direct preclinical and clinical development programs. Research and development expense includes personnel, facilities, manufacturing and quality operations, pharmaceutical and device development, research, clinical, regulatory, other preclinical and clinical activities and medical affairs. Research and development costs are charged to operations as incurred in accordance with Accounting Standards Codification (ASC) Topic 730, *Research and Development*.

Stock-based compensation

Stock-based compensation is accounted for under the fair value recognition provisions of ASC Topic 718, *Stock Compensation* (ASC Topic 718). *See*, – Note 15 – Stock Options and Stock-based Employee Compensation, for a detailed description of our recognition of stock-based compensation expense. The fair value of stock option grants is recognized evenly over the vesting period of the options or over the period between the grant date and the time the option becomes non-forfeitable by the employee, whichever is shorter.

Warrant accounting

We account for common stock warrants in accordance with applicable accounting guidance provided in ASC Topic 815, *Derivatives and Hedging – Contracts in Entity's Own Equity* (ASC Topic 815), as either derivative liabilities or as equity instruments depending on the specific terms of the warrant agreement.

Income taxes

We account for income taxes in accordance with ASC Topic 740, Accounting for Income Taxes, which requires the recognition of deferred tax liabilities and assets for the expected future tax consequences of temporary differences between financial statement carrying amounts and the tax basis of assets and liabilities.

We use a recognition threshold and measurement attribute for the financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. Because we have never realized a profit, management has fully reserved the net deferred tax asset since realization is not assured.

Beneficial Conversion Feature

A beneficial conversion feature arises when a debt or equity security is issued with an embedded conversion option that is beneficial to the investor (or in the money) at inception due to the conversion option having an effective conversion price that is less than the fair value of the underlying stock at the commitment date.

Preferred Stock

The issuance of Series A Convertible Preferred Stock (Preferred Shares) in the first quarter of 2017 (see, "– Note 14 – Stockholders' Equity") resulted in a beneficial conversion feature. We recognized this feature by allocating the intrinsic value of the beneficial conversion feature, which is the number of shares of common stock available upon conversion multiplied by the difference between the effective conversion price per share and the fair value of common stock per share on the commitment date, to additional paid-in capital, resulting in a discount on the Preferred Shares. As the Preferred Shares are immediately convertible by the holders, the discount allocated to the beneficial conversion feature was immediately accreted and recognized as a $3.6 million one-time, non-cash deemed dividend to the preferred shareholders during the first quarter of 2017.

An additional discount to the Preferred Shares of $4.5 million was created due to the allocation of proceeds to the Warrants which were issued with the Preferred Shares. This discount is amortized proportionately as the Preferred Shares are converted. For the years ended December 31, 2018 and December 31, 2017, we recognized a non-cash deemed dividend to the preferred shareholders of $1.7 million and $2.8 million, respectively, related to the Preferred Shares converted during the period. As of December 31, 2018, there were no Preferred Shares remaining to be converted.

Convertible Note

The issuance on July 2, 2018 of a Secured Convertible Promissory Note (the Note) to Panacea Venture Management Company Ltd. (Panacea) with respect to a loan facility in the aggregate amount of $1.5 million resulted in a beneficial conversion feature. We recognized this feature by allocating the relative fair value of the conversion option, which is the number of shares of common stock available upon conversion multiplied by the difference between the effective conversion price per share and the fair value of common stock per share on the commitment date, resulting in a discount on the Note. We recorded the Note as current debt at its face value of $1.5 million less debt discount consisting of (i) $0.4 million related to the beneficial conversion feature and (ii) $0.4 million in fair value of the warrants issued in connection with the Note. The discount was accreted to the $1.5 million loan over its term using the effective interest method (*see*, – Note 11 – Loan Payable). On December 27, 2018, we repaid the Note in its entirety in cash of $1.5 million. As part of the extinguishment of debt, we recorded a gain on extinguishment of debt of approximately $0.4 million, relating to the reacquisition of the beneficial conversion option. The gain was calculated using the intrinsic value of the beneficial conversion option, which is the product of: (i) the difference between the common stock price on the date of extinguishment of $5.11 and the conversion price of $4.00, and (ii) 375,000 shares convertible into common stock.

Net loss per common share

Basic net loss per share is computed by dividing net loss by the weighted average number of common shares outstanding for the period. Diluted net loss per common share is computed by giving effect to all potentially dilutive securities outstanding for the period. For the years ended December 31, 2018 and 2017, the number of shares of common stock potentially issuable upon the conversion of preferred stock or the exercise of certain stock options and warrants was 14.4 million and 1.0 million shares, respectively. As of December 31, 2018 and 2017, all potentially dilutive securities were anti-dilutive and therefore have been excluded from the computation of diluted net loss per share.

We do not have any components of other comprehensive income (loss).

Concentration of Suppliers

We currently obtain the active pharmaceutical ingredients (APIs) of our KL4 surfactant drug products from single-source suppliers. In addition, we rely on a number of third-party institutions and laboratories that perform various studies as well as quality control release and stability testing and other activities related to our KL4 surfactant development and manufacturing activities. At the present time, several of these laboratories are single-source providers. The loss of one or more of our single-source suppliers or testing laboratories could have a material adverse effect upon our operations.

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Business segments

We currently operate in one business segment, which is the research and development of products focused on acute pulmonary and cardiovascular diseases, and the manufacture and commercial sales of approved products. We are managed and operated as one business. A single management team that reports to the Chief Executive Officer comprehensively manages the entire business. We do not operate separate lines of business with respect to our product candidates.

Recent Accounting Pronouncements

Recently Adopted Accounting Standards

In May 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) 2014-09, *Revenue from Contracts with Customers (Topic 606)*, which was subsequently amended by several other ASUs related to Topic 606 to, among other things, defer the effective date and clarify various aspects of the new revenue guidance including principal versus agent considerations, identifying performance obligations, licensing, and other improvements and practical expedients. We adopted ASU 2014-09, as amended, effective January 1, 2018 using the modified retrospective transition method. In June 2017, we entered into a License Agreement with Lee's Pharmaceutical (HK) Ltd. (Lee's (HK)), granting Lee's (HK) rights to develop and commercialize our products in a specific Asian territory. The consideration we are eligible to receive under this agreement includes an upfront payment, contingent revenues in the form of regulatory and commercial milestones, and sales-based milestone and royalty payments. We evaluated the License Agreement under ASU 2014-09 and determined that there was no material impact to revenues for any of the years presented upon adoption. Additionally, there were no revisions to any balance sheet components of revenues such as deferred revenues or beginning retained earnings as a result of using the modified retrospective method. The primary impact on our financial statements is related to revised or additional disclosures with respect to revenues and cash flows arising from contracts with customers (*See,* "– Note 16 – Collaboration, Licensing and Research Funding Agreements).

In May 2017, the FASB issued ASU 2017-09, *Compensation—Stock Compensation (Topic 718), Scope of Modification Accounting*. This ASU clarifies when to account for a change to the terms or conditions of a share-based payment award as a modification. Under the new guidance, modification accounting is required only if the fair value, the vesting conditions, or the classification of the award (as equity or liability) changes as a result of the change in terms or conditions. The ASU is effective prospectively for the annual period ending December 31, 2018 and interim periods within that annual period. We adopted ASU 2017-09 effective January 1, 2018 and the adoption did not have a material impact on our annual 2018 financial statements.

In August 2016, the FASB issued ASU 2016-15, *Statement of Cash Flows (Topic 230), Classification of Certain Cash Receipts and Cash Payments*. This ASU clarifies clarify how entities should classify certain cash receipts and cash payments related to eight specific cash flow issues, including debt prepayment or extinguishment costs, with the objective of reducing diversity in how certain cash receipts and cash payments are presented and classified in the statement of cash flows. The ASU also clarifies how the predominance principle should be applied when cash receipts and cash payments have aspects of more than one class of cash flows. The ASU is effective retrospectively for the annual period ending December 31, 2018 and interim periods within that annual period. We adopted ASU 2016-15 effective January 1, 2018 and the adoption did not have a material impact on our annual 2018 financial statements.

In January 2017, the FASB issued ASU 2017-01, *Business Combinations (Topic 805), Clarifying the Definition of a Business*. The FASB changed its definition of a business in an effort to help entities determine whether a set of transferred assets and activities is a business. The guidance requires an entity to first evaluate whether substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets. If this threshold is met, the set of transferred assets and activities is not a business. If the threshold is not met, the entity evaluates whether the set meets the requirements of a business, which includes, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs. The ASU is effective for the annual period ending December 31, 2018 and interim periods within that annual period. We adopted ASU 2017-01 effective January 1, 2018 and the adoption did not have a material impact on our annual 2018 financial statements.

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Recent Accounting Pronouncements

In February 2016, the FASB issued ASU 2016-02, *Leases* (Topic 842). This ASU requires lessees to put most leases on their balance sheets but recognize expenses in the income statement in a manner similar to current accounting standards. The ASU is effective January 1, 2019. Early adoption is permitted. The standard requires a modified retrospective approach; however, the FASB recently added a transition option to the leases standard that allows entities to apply the new guidance in the year of transition rather than at the beginning of the earliest period presented. We have not elected to early adopt this standard. While we continue to assess all the effects of adoption, we believe the most significant effect relates to the recognition of right-of-use assets and corresponding liabilities on our consolidated balance sheet, primarily related to existing facility operating leases, and providing new disclosures with regards to our leasing activities.

In January 2017, the FASB issued ASU 2017-04, *Intangibles - Goodwill and Other: Simplifying the Test for Goodwill Impairment*. ASU 2017-04 simplifies the subsequent measurement of goodwill by removing the second step of the two-step impairment test and specifies that goodwill impairment should be measured by comparing the fair value of a reporting unit with its carrying amount. An impairment charge should be recognized for the amount by which the carrying amount exceeds the reporting unit's fair value; however, the loss recognized should not exceed the total amount of goodwill allocated to that reporting unit. An entity still has the option to perform the qualitative assessment for a reporting unit to determine if the quantitative impairment test is necessary. ASU 2017-04 is effective for annual or interim goodwill impairment tests performed in fiscal years beginning after December 15, 2019; early adoption is permitted. We currently anticipate that the adoption of ASU 2017-04 will not have a material impact on our financial statements.

Note 6 – License Revenue with Affiliate

(in thousands)	Year Ended December 31, 2018	2017
License revenue with affiliate	$ 1,023	$ 102

License revenue with affiliate for years ended December 31, 2018 and 2017 represents revenue from a License Agreement with Lee's (HK) and constitutes a contract with a customer accounted for in accordance with ASC Topic 606, which we adopted effective January 1, 2018 (*see*, Note 5 – Accounting Policies and Recent Accounting Pronouncements, and Note 16 – Collaboration, Licensing and Research Funding Agreements). There was no impact to License revenue with affiliate previously recognized as a result of the adoption of ASC Topic 606.

Note 7 – Fair Value Measurements

Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date.

Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. The fair value hierarchy is based on three levels of inputs, of which the first two are considered observable and the last unobservable, as follows:

- Level 1 – Quoted prices in active markets for identical assets and liabilities.
- Level 2 – Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.
- Level 3 – Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

Fair Value on a Recurring Basis

Assets and liabilities measured at fair value on a recurring basis are categorized in the table below as of December 31, 2018 and 2017:

(in thousands)	Fair Value December 31, 2018	Fair value measurement using Level 1	Level 2	Level 3
Assets:				
Cash and cash equivalents	$ 5,234	$ 5,234	$ -	$ -
U.S. Treasury notes	19,912	$ 19,912		
Certificate of deposit	171	171	-	-
Total Assets	$ 25,317	$ 25,317	$ -	$ -

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(in thousands)	Fair Value December 31, 2017	Fair value measurement using Level 1	Level 2	Level 3
Assets:				
Cash and cash equivalents	$ 1,815	$ 1,815	$ -	$ -
Certificate of deposit	225	225	-	-
Total Assets	$ 2,040	$ 2,040	$ -	$ -

Note 8 – Property and Equipment

Property and equipment is comprised of the following:

(in thousands)	December 31, 2018	2017
Manufacturing, laboratory & office equipment	$ 4,359	$ 4,965
Furniture & fixtures	390	615
Leasehold improvements	2,469	2,458
Subtotal	7,218	8,038
Accumulated depreciation and amortization	(6,416)	(7,153)
Property and equipment, net	$ 802	$ 885

Depreciation expense on property and equipment for the years ended December 31, 2018 and 2017 was $0.2 million and $0.2 million, respectively.

Note 9 – Collaboration and Device Development Payable

Collaboration and device development payable represents amounts due to Battelle under a collaboration agreement related to the development of our phase 3 ADS (*see*, Note 16 – Collaboration, Licensing and Research Funding Agreements) and a Research and Development Services Agreement (RDSA) dated June 2012 for our prototype phase 2 ADS. As of December 31, 2018 and 2017, collaboration and device development payable was $2.6 million and $4.4 million, respectively, including accrued interest.

Restructuring of the Battelle Payables

On December 7, 2018, we entered into a payment restructuring agreement with Battelle Memorial Institute (“Battelle”) in which we agreed to the following: (i) the outstanding amounts owing under the Collaboration Agreement and RDSA (such amounts, the Battelle Payables) will continue to accrue interest at a rate of 6.0% per annum and shall be payable on a monthly basis or any unpaid interest shall be added to the balance of the Battelle Payables, (ii) we and Battelle will continue the development activities relating to AEROSURF under the RDSA, and we will prepay for services to be provided by Battelle until we have repaid $3.0 million of the Battelle Payables, after which time, services incurred shall be payable upon 30 days of receipt of the invoice, (iii) Battelle participated in the December 2018 Private Placement Financing for $1.0 million in a debt-equity exchange for a like amount of Battelle Payables (*see*, Note 14 – Stockholders’ Equity), (iv) upon the closing of the Private Placement Financing, we paid Battelle cash in the amount of $972,281, and thereafter initiated payments totaling an aggregate $1,250,000, payable in five equal, consecutive monthly installments of $250,000, and (v) increased the royalty cap previously set forth in the collaboration agreement from $25.0 million to $35.0 million. In addition, we have agreed to make two milestone payments to Battelle as follow: (i) upon enrollment of the first patient in the next AEROSURF clinical study, an amount equal to one half of the then-outstanding Battelle Payables (including unpaid interest), and (ii) when we complete the device technology transfer for the phase 3 ADS to Mack, an amount equal to the then-outstanding Battelle Payables, including unpaid interest. If any amounts of the Battelle Payables remain unpaid by December 31, 2019, then all unpaid Battelle Payables will be due on January 7, 2020.

Management determined the payment restructuring agreement of the Battelle Payables do not represent a troubled debt restructuring as Battelle did not grant us a concession. Further, the payment restructuring agreement constitutes a debt modification as the restructured terms do not result in a substantially different instrument.

In connection with the payment restructuring agreement, we also issued to Battelle Series E Warrants (“Series E Warrants”) to purchase 75,000 shares of common stock, at an exercise price equal to $6.50 per share (“the Exercise Price”). The Series E Warrants may be exercised after the date of issuance through the 5-year anniversary of the date of issuance on December 11, 2023. The Series E Warrants may not be exercised to the extent that the holder thereof would, following such exercise or conversion, beneficially own more than 9.99% (or other percent as designated by each holder) of our outstanding shares of common stock. The Series E Warrants contain customary provisions that adjust the Exercise Price and the number of shares of common stock into which the Series E Warrants are exercisable in the event of a corporate transaction.

The Series E Warrants are derivatives that qualify for an exemption from liability accounting as provided for in ASC Topic 815, Derivatives and Hedging – Contracts in Entity's own Equity, and have been classified as equity. The fair value at issuance of the Series E Warrants was determined using the Black-Scholes option-pricing model. The input assumptions used in the valuation are the historical volatility of our common stock price, the expected term of the warrants, and the risk-free interest rate based on the five-year treasury bill rate in effect at the measurement date.

Significant Input Assumptions of Warrant Valuation	
Historical volatility	103%
Expected term (in years)	5
Risk-free interest rate	2.70%

As of December 31, 2018, we had accrued interest expense relating to the Battelle Payables of $0.3 million.

Extinguishment of Collaboration and Device Development Payable

On December 21, 2018, as part of the Private Placement Financing, we converted $1.0 million of existing Battelle Payables on the same terms as the Investors of the Private Placement Financing. In connection with the conversion of the Battelle Payables, we issued: (i) 301,823 shares of common stock based at $3.3132 per share, (ii) Series F Warrants to purchase 51,310 shares of common stock, at an exercise price equal to $3.68 per share, and (iii) Series G Warrants to purchase 99,602 shares common stock, at an exercise price equal to $4.05 per share. The Series F Warrants are exercisable at any time after the date of issuance and through the 18th month anniversary of the date of issuance and the Series G Warrants may be exercise through the 5-year anniversary of the date of issuance.

The conversion of the Battelle Payables is treated as an extinguishment of outstanding liabilities. We recorded a loss on extinguishment of debt of approximately $0.5 million. The loss was calculated as the difference between: (i) the aggregate fair value of approximately $1.5 million, based on the fair value of the common stock and Warrants on December 21, 2018 and (ii) the carrying value of the Battelle Payables of $1.0 million.

Note 10 – Accrued Expenses

Accrued expenses are comprised of the following:

(in thousands)	December 31, 2018	December 31, 2017
Professional fees	$ 2,473	$ 412
Research and development	2,361	1,778
Salaries, bonus & benefits	815	1,008
Manufacturing operations	212	537
Other	604	399
Total accrued expenses	$ 6,465	$ 4,134

Note 11 – Loan Payable

In January 2018 and March 2018, LPH Investments Limited ("LPH"), an affiliate of Lee's, agreed to lend us $1.5 million and $1.0 million, respectively, to support our AEROSURF development activities and sustain our operations while we sought to identify and advance one or more potential strategic initiatives as defined in the related loan agreements (Funding Event). The loans accrue interest at a rate of 6% per annum and mature upon the earlier of the closing date of the Funding Event or December 31, 2018. To secure our obligations under these loans, we granted LPH a security interest in substantially all our assets pursuant to the terms of a Security Agreement with LPH dated March 1, 2018 (LPH Security Agreement).

During the third and fourth quarters of 2018, LPH agreed to lend us funds to sustain our operations while we continued to work on a strategic transaction. The initial loan was funded on August 14, 2018 in the amount of $0.3 million, and subsequent loans on the following dates and in the following amounts: August 29, 2018, in the amount of $0.48 million; September 12, 2018 in the amount of $0.5 million; September 27, 2018 in the amount of $0.5 million; October 19, 2018 in the amount of $0.43 million; November 2, 2018 in the amount of $0.5 million; November 19, 2018 in the amount of $0.35 million; and December 5, 2018 in the amount of $0.6 million. The loans accrued interest at a rate of 6% per annum and matured upon the earlier of (i) the closing date for the strategic transaction (as defined in the related loan agreements), provided that the we were able to raise a minimum of $30 million in connection with such transaction, or (ii) March 31, 2019. In each case, we granted to LPH a security interest in substantially all of our assets pursuant to the terms of the LPH Security Agreement.

Extinguishment of Loan Payable

On December 21, 2018, as part of the Private Placement Financing, we converted $6.0 million of existing loan payable obligations to LPH on the same terms as those of the Investors of the private placement. In connection with the conversion of Lee's debt, we issued: (i) 1,810,938 shares of common stock based at $3.3132 per share, (ii) Series F Warrants to purchase 307,859 shares of common stock, at an exercise price equal to $3.68 per share, and (iii) Series G Warrants to purchase 597,610 shares common stock, at an exercise price equal to $4.05 per share. The Series F Warrants are exercisable at any time after the date of issuance and through the 18-month anniversary of the date of issuance and the Series G Warrants may be exercised through the 5-year anniversary of the date of issuance.

The conversion of the loan payable to LPH is treated as an extinguishment of debt and does not represent a capital transaction as the Private Placement Financing included third-party investors and all investors received identical terms. We recorded a loss on extinguishment of debt approximately $3.2 million. The loss was calculated as the difference between: (i) the aggregate fair value of approximately $9.2 million, based on the fair value of the common stock and Warrants on December 21, 2018, and (ii) the carrying value of the debt liabilities of $6.0 million.

The balance of the loan payable to LPH of $160,000 was paid along with accrued interest of $182,000 on December 27, 2018.

Assumption of bank debt as part of the CVie Acquisition

As part of the CVie Acquisition, we assumed approximately $4.5 million (or NTD $138.0 million) in a bank credit facility due in March 2020.

In September 2016, CVie entered into a 12-month revolving credit facility of approximately $2.9 million (or NTD $90.0 million) with O-Bank Co., Ltd. to finance operating activities. The facility was later renewed and increased to approximately $5.84 million (or NTD $180.0 million) in September 2017. The credit facility was guaranteed by Lee's, which pledged bank deposits in the amount of 110% of the actual borrowing amount. The guaranty was part of the facility; however, we do not have a written commitment from Lee's to maintain the collateral. Interest, payable in cash on a monthly basis, is determined based on 90-day TAIBOR (the Taipei Interbank Offer Rate) plus 0.91%. The credit facility will expire on September 11, 2019 and matures six months after the expiration date, on March 11, 2020. Although we reached an understanding with Lee's that it would maintain the bank deposits securing its guaranty obligation under the credit facility, we do not have a written agreement with Lee's requiring it to do so; therefore, the $4.5 million outstanding under the facility has been classified as a current liability on the balance sheet.

As of December 31, 2018, the outstanding principal was approximately $4.5 million (or NTD $138.0 million), due to exchange rate fluctuations.

Assumption of Lee's debt as part of the CVie Acquisition

As part of the CVie Acquisition, we assumed approximately $3.5 million (or NTD $106.2 million) of debt payable to Lee's Pharmaceutical International Limited (Lee's International).

From April 24, 2018 to November 16, 2018, CVie entered into four separate agreements to borrow an aggregate of approximately $3.5 million from Lee's International. The terms of the loan agreements are identical where the interest, payable in cash upon maturity, is 4% per annum and each of the four separate loans will mature one year from the effective date as follows: $0.5 million in April 2019; $0.3 million in September 2019; $0.2 million in October 2019; and $2.5 million in November 2019.

As of December 31, 2018, the outstanding principal was approximately $3.5 million (or NTD $106.2 million), due to exchange rate fluctuations.

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Note 12 – Convertible Note Payable

On July 2, 2018, we issued to Panacea Venture Management Company Ltd. (Panacea) a Secured Convertible Promissory Note (the Note) with respect to a loan facility in the aggregate amount of up to $1.5 million, which was funded in two loans of, $1.0 million on the date of the Note and $0.5 million on July 23, 2018. The Note had a maturity date of December 31, 2018 and accrued interest at a rate of 15% per annum until the Note was paid in full or converted into shares of our common stock at a price per share of $4.00. In addition, in lieu of converting the Note, Panacea could deliver the Note into a private placement in which Panacea Venture Healthcare Fund I L.P., an affiliate of Panacea, participated. In connection with these Loans, we granted to Panacea a security interest in substantially all our assets.

In connection with the Note, we issued to Panacea warrants (the "Series D Warrants") to purchase 187,500 shares (the "Warrant Shares") at an exercise price of $4.00 per Warrant Share (the "Exercise Price"). The Warrants may be exercised at any time beginning six months after the date of issuance and through the fifth anniversary of the date of issuance. The Warrants may not be exercised to the extent that the holder would, following such exercise, beneficially own more than 9.99% of our outstanding shares of common stock, which percentage may be increased, decreased or waived by such holder upon sixty-one days' notice to us. The Warrants also contain customary provisions that adjust the Exercise Price and the number of Warrant Shares in the event of a corporate transaction.

We recorded the Note as current debt at its face value of $1.5 million less debt discounts consisting of (i) $0.4 million fair value of the warrants issued in connection with the Note and (ii) a $0.4 million beneficial conversion feature related to an embedded conversion option that had an effective conversion price that was less than the fair value of the underlying stock at the commitment date. The discount is being accreted to the $1.5 million loan over its term using the effective interest method. The Panacea Warrants are derivatives that qualify for an exemption from liability accounting as provided for in ASC Topic 815, *Derivatives and Hedging – Contracts in Entity's Own Equity*, and have been classified as equity.

The fair value at issuance of the Panacea Warrants was determined using the Black-Scholes option-pricing model. The input assumptions used in the valuation are the historical volatility of our common stock price, the expected term of the warrants, and the risk-free interest rate based on the five-year treasury bill rate in effect at the measurement date.

Significant Input Assumptions of Warrant Valuation	
Historical volatility	103%
Expected term (in years)	5
Risk-free interest rate	2.75%

The following amounts comprise the convertible note interest expense for the periods presented:

(in thousands)	**Year Ended December 31, 2018**
Non-cash amortization of debt discounts	$ 833
Cash interest expense	106
Total convertible note interest expense	$ 939

Extinguishment of Panacea Convertible Promissory Note

On December 27, 2018, we repaid the Note in its entirety in cash of $1.5 million. As part of the extinguishment of debt, we recorded a gain on extinguishment of debt of approximately $0.4 million, relating to the reacquisition of the beneficial conversion option. The gain was calculated using the intrinsic value of the beneficial conversion option, which is the product of: (i) the difference between the common stock price on the date of extinguishment of $5.11 and the conversion price of $4.00, and (ii) 375,000 shares convertible into common stock.

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Note 13 – Restructured Debt Liability

(in thousands)	December 31, 2018	December 31, 2017
Restructured debt liability - contingent milestone payments	$ 15,000	$ 15,000

On November 1, 2017, we and Deerfield entered into an Exchange and Termination Agreement pursuant to which (i) promissory notes evidencing a loan with affiliates of Deerfield Management Company L.P. (Deerfield Loan) in the aggregate principal amount of $25 million and (ii) warrants to purchase up to 25,000 shares of our common stock at an exercise price of $786.80 per share held by Deerfield were cancelled in consideration for (i) a cash payment in the aggregate amount of $2.5 million, (ii) 71,111 shares of common stock, representing 2% of fully-diluted shares outstanding (as defined in the Exchange and Termination Agreement) on the closing date, and (iii) the right to receive certain milestone payments based on achievement of specified AEROSURF development and commercial milestones, which, if achieved, could potentially total up to $15 million. In addition, a related security agreement, pursuant to which Deerfield held a security interest in substantially all of our assets, was terminated. We established a $15 million long-term liability for the contingent milestone payments potentially due to Deerfield under the Exchange and Termination Agreement (*see*, Note 5 – Accounting Policies and Recent Accounting Pronouncements). The liability has been recorded at full value of the contingent milestones and will continue to be carried at full value until the milestones are achieved and paid or milestones are not achieved and the liability is written off as a gain on debt restructuring.

Note 14 – Stockholders' Equity

Private Placement Offerings

December 2018 Private Placement Financing

On December 21, 2018, we completed a private placement offering and entered into a Registration Rights Agreement with select institutional investors (Investors), for the purchase of an aggregate of 11,785,540 shares of common stock at a price per share of $3.3132, for an aggregate purchase price of approximately $39.0 million (Private Placement Financing). Included in the purchase price, each of LPH II Investments Limited (LPH II), an affiliate of Lee's Pharmaceutical Holdings Ltd. (Lee's), and Battelle, converted $6.0 million and $1.0 million, respectively, of existing debt obligations on the same terms as the other Investors. In connection with the offering, we issued (i) Series F Warrants to purchase an aggregate of 2,003,541 shares of common stock at an exercise price equal to $3.68 per share, which are exercisable through the 18-month anniversary of the date of issuance (the Series F Warrants), and (ii) Series G Warrants to purchase an aggregate of 3,889,229 shares of common stock at an exercise price equal to $4.05 per share, which are exercisable through the 5-year anniversary of the date of issuance (the Series G Warrants and, together with the Series F Warrants, the December 2018 Warrants). The December 2018 Warrants (i) may not be exercised to the extent that following such exercise, the holder would beneficially own more than 9.99% (or other percent as designated by each holder) of our outstanding shares of common stock, and (ii) contain customary provisions that adjust the exercise price and the number of shares of common stock into which the December 2018 Warrants are exercisable in the event of a corporate transaction.

Under the Registration Rights Agreement, we agreed to file by May 1, 2019 a resale registration statement with the SEC to register for subsequent resale the shares of common stock issued in the Private Placement Financing and the shares of common stock to be issued upon exercise of the December 2018 Warrants.

April 2018 Private Placement

On April 4, 2018, we completed a private placement offering and entered into a Registration Rights Agreement with LPH II for the purchase of $2.6 million of our common stock at a purchase price per share of $4.80, and issued 541,667 shares of common stock and warrants to purchase 135,417 shares of our common stock at an exercise price of $5.52 per share. The warrants are exercisable after 6 months and through the seventh anniversary of the issue date. Under the Registration Rights Agreement, we agreed to file an initial resale registration statement with the SEC to register for subsequent resale the shares and the warrant shares. We are required to seek registration of 25% of the shares and warrant shares on such initial resale registration statement. From time to time, following the 180th day from March 30, 2018, LPH II or a majority of the holders of the shares and warrant shares may require us to file additional registration statement(s) to register the resale of the balance of the shares and warrant shares, subject to certain limitations.

Share Purchase Agreement

Effective October 27, 2017, we entered into a Share Purchase Agreement (SPA) with LPH, an affiliate of Lee’s. Under the agreement, LPH invested $10 million (the Investment) in our common stock and acquired 2,311,604 shares (the Shares), at a price of $4.326 per share, which represented a 15% premium over the average of the daily volume-weighted average price per share (VWAP) over the 10-day trading period ending on and including the date of the SPA. Following the transactions described in the SPA, LPH beneficially owned 73% of our issued and outstanding shares of common stock. The Investment included cancellation of $3.9 million in outstanding loans that we borrowed from Lee’s (HK) under the Loan Agreement, effective August 14, 2017, between ourselves and Lee's (HK). Although the SPA granted LPH the right to appoint up to two individuals to serve on our Board of Directors, and LPH was permitted to designate such individuals on or prior to the 30th day following the closing of the transactions contemplated by the SPA (the Closing) no such appointments were made. In addition, the SPA also amended the executive employment agreement of each of our President and Chief Executive Officer (Craig Fraser), Senior Vice President and Chief Financial Officer (John A. Tattory) and Senior Vice President and Chief Medical Officer (Steven G. Simonson, M.D.), such that the executives agreed to waive the guaranteed Annual Bonuses (as defined in each executive's employment agreement) that otherwise would have been payable to the executives during the 24-month period following the change of control to Lee’s. Also under the SPA, each executive was awarded restricted stock units under our 2011 Long-Term Incentive Plan, as amended, having a value when issued equal to the combined total value of the 2017 and 2018 Target Bonus Amounts (as defined in each executive's employment agreement) and initially vesting in two equal installments on March 15, 2018 and March 15, 2019. Under the terms of the SPA, we also granted to LPH a preemptive right to purchase in future offerings of equity securities up to that number of shares of our equity securities needed to maintain LPH's percentage of beneficial ownership of our outstanding voting stock immediately prior to each such offering, subject to certain limitations and exclusions.

Contemporaneously with the execution of the SPA, we and LPH entered into a registration rights agreement pursuant to which we agreed to provide certain registration rights with respect to the Shares under the SPA, which rights are limited to registration of up to 25% of the Shares during the initial 18-month period following the closing of the SPA. We issued the Shares to LPH pursuant to Rule 506(b) of Regulation D and Regulation S under, and Section 4(a)(2) of, the Securities Act of 1933.

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February 2017 Private Placement

On February 15, 2017, we completed a private placement offering of 7,049 Series A Convertible Preferred Stock units at a price per unit of $1,495, for an aggregate purchase price of approximately $10.5 million, including $1.6 million of non-cash consideration representing a reduction in amounts due and accrued as of December 31, 2016 for current development services that otherwise would have become payable in cash in the first and second quarters of 2017. Each unit consisted of: (i) one share of Series A Convertible Preferred Stock, par value $0.001 per share (Preferred Shares); and (ii) Series A-1 Warrants to purchase 50 shares of common stock at an exercise price equal to $27.40 per share. Each Preferred Share was convertible at the holder's option at any time into 50 shares of common stock. The Series A-1 Warrants may be exercised through February 15, 2024. The Preferred Shares and Series A-1 Warrants may not be converted or exercised to the extent that the holder would, following such exercise or conversion, would beneficially own more than 9.99% (or other lesser percent as designated by each holder) of our outstanding shares of common stock. In the event of a liquidation, including without limitation, the sale of substantially all of our assets and certain mergers and other corporate transactions (as defined in the Certificate of Designation of Preferences, Rights and Limitations relating to the Preferred Shares), the holder of Preferred Shares would have had a liquidation preference that could result in the holder receiving a return of its initial investment before any payments are made to holders of common stock, and then participating with other equity holders until it received in the aggregate up to three times its original investment. In addition to the offering, the securities purchase agreement also provided that, until February 13, 2018, the investors were entitled to participate in subsequent bona fide capital raising transactions.

To facilitate consummation of the Share Purchase Agreement in October 2017 (see – Share Purchase Agreement), Battelle, which held 1,095 Preferred Shares, executed a waiver wherein Battelle waived its right to the liquidation preference with respect to their Preferred Shares. We considered the relevant accounting guidance and concluded that the waiver did not remove a substantive term or otherwise fundamentally change the Preferred Shares. As a result, the Preferred Shares were modified rather than extinguished, and Battelle did not receive incremental fair value in the modification. There was, therefore, no incremental expense to be recognized related to the waiver. In addition, we and Battelle entered into a non-binding memorandum of understanding outlining the key terms for a potential restructuring of the amounts due to Battelle under development and collaboration agreements between ourselves and Battelle.

As of December 31, 2018, all outstanding Preferred Shares have been converted into shares of common stock.

At-the-Market Program (ATM Program)

Stifel ATM Program

On February 11, 2013, we entered into an At-the-Market Equity Sales Agreement (ATM Agreement) with Stifel, under which Stifel, as our exclusive agent, at our discretion and at such times that we may determine from time to time, may sell over a three-year period up to a maximum of $25 million of shares of our common stock (ATM Program). We were not required to sell any shares at any time during the term of the ATM Program.

If we issued a sale notice to Stifel, we may have designated the minimum price per share at which shares may be sold and the maximum number of shares that Stifel is directed to sell during any selling period. We agreed to pay Stifel a commission equal to 3.0% of the gross sales price of any shares sold pursuant to the ATM Agreement. With the exception of expenses related to the shares, Stifel was responsible for all of its own costs and expenses incurred in connection with the offering.

During 2017, we completed registered offerings of our common stock under the ATM Program of 42,357 shares, resulting in aggregate gross and net proceeds to us of approximately $1.1 million and $1.0 million, respectively.

Effective with our transition to the OTCQB® Market (OTCQB) tier in early May 2017, the ATM Program was no longer available to us.

401(k) Plan Employer Match

We have a voluntary 401(k) savings plan (401(k) Plan) covering eligible employees that allows for periodic discretionary company matches equal to a percentage of each participant’s contributions (up to the maximum deduction allowed, including “catch up” amounts). During 2017, we provided for the company match by issuing shares of common stock that are registered pursuant to a registration statement on Form S-8 filed with the SEC. For the year ended December 31, 2017, the match resulted in the issuance of 7,561 shares of common stock. Expense associated with the 401(k) match for the year ended December 31, 2017 was $0.1 million. During 2018, we did not have a company match.

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Common Shares Reserved for Future Issuance

Common shares reserved for potential future issuance upon exercise of warrants

The chart below summarizes shares of our common stock reserved for future issuance upon the exercise of warrants:

(in thousands, except price per share data)	December 31, 2018	December 31, 2017	Exercise Price	Expiration Date
Investors - Aerosurf	2,963	-	$ -	02/14/24
Investors - December 2018 financing - long-term	3,889	-	$ 4.05	12/04/23
Investors - December 2018 financing - short-term	2,004	-	$ 3.68	06/24/20
Battelle - 2018 payables restructuring agreement (1)	75	-	$ 6.50	12/07/23
Panacea Venture Management Company Ltd.	188	-	$ 4.00	07/02/23
LPH II Investments Limited	135	-	$ 5.52	04/04/25
Investors - February 2017 financing	352	352	$ 27.40	02/15/24
Investors - July 2015 financing	240	240	$ 196.00	07/22/22
Battelle - 2014 collaboration agreement (1)	4	4	$ 1,400.00	10/10/24
Total	9,850	596		

(1) *See*, – Note 16 – Collaboration, Licensing and Research Funding Agreements, for further details on the Battelle collaboration agreement.

Common shares reserved for potential future issuance upon exercise of stock options or granting of additional equity incentive awards

At the 2017 Annual Meeting of Stockholders, our stockholders approved an increase in the number of shares available for issuance under our Amended and Restated 2011 Long-Term Incentive Plan (the “2011 Plan”) by 37,500. On October 25, 2017 the Board of Directors approved an increase to the number of shares available for issuance under the Plan by 1.75 million, which increase was approved by an action of the majority stockholder by written consent without a meeting of shareholders dated as of November 13, 2017. On December 24, 2018, the Compensation Committee of our Board of Directors approved an increase in the number of shares available for issuance under the Plan by approximately 4.2 million shares, which increase was also approved by an action by written consent without a meeting of holders of a majority of our outstanding shares of common stock.

As of December 31, 2018 and 2017, we had 1.5 million and 1.6 million shares, respectively, available for potential future issuance under the 2011 Plan.

Common shares reserved for potential future issuance under our 401(k) Plan

As of December 31, 2018 and 2017, we had 807 common shares reserved for potential future issuance under the 401(k) Plan.

Note 15 – Stock Options and Stock-based Employee Compensation

Long-Term Incentive Plans

We have the 2011 Plan that provides for the grant of long-term equity and cash incentive compensation awards and replaced a 2007 Long-Term Incentive Plan.

There are 6.1 million shares of our common stock authorized under the 2011 Plan, of which 1.5 million shares remain available for issuance. Awards under the Plan may include stock options, stock appreciation rights (SARs), restricted stock awards (RSAs), restricted stock units, other performance and stock-based awards, and dividend equivalents.

An administrative committee (the Committee – currently the Compensation Committee of the Board of Directors) or Committee delegates may determine the types, the number of shares covered by, and the terms and conditions of, such awards. Eligible participants may include any of our employees, directors, advisors or consultants.

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Stock options and restricted stock units (RSUs) outstanding and available for future issuance are as follows:

(in thousands)	December 31, 2018	December 31, 2017
Stock Options and RSUs Outstanding		
2011 Plan	4,558	263
Non-Plan	10	10
Total Outstanding	4,568	273
Available for Future Grants under 2011 Plan	1,453	1,623

No SARs, RSAs, other performance and stock-based awards, or dividend equivalents have been granted under the 2011 Plan. Although individual grants may vary, option awards generally are exercisable upon vesting, vest in a series of three successive, equal installments beginning with the first anniversary of the grant date, and have a 10-year term. Non-Plan stock options outstanding are in connection with the hiring of our Chief Executive Officer, Mr. Fraser, on February 1, 2016. Mr. Fraser was awarded an inducement grant in accordance with Nasdaq Listing Rule 5635(c)(4) and this inducement grant vests in a series of three successive, equal installments beginning with the first anniversary of the grant date, and has a 10-year term.

A summary of activity under our long-term incentive plans is presented below:

(in thousands, except for weighted-average data)

Stock Options	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (In Yrs)
Outstanding at January 1, 2018	84	$ 163.20	
Granted	4,337	4.22	
Forfeited or expired	(4)	617.75	
Outstanding at December 31, 2018	4,417	$ 6.73	9.9
Vested and exercisable at December 31, 2018	63	$ 171.87	6.5
Vested and expected to vest at December 31, 2018	4,243	$ 6.78	9.9

(in thousands, except for weighted-average data)

Restricted Stock Units	Shares	Weighted-Average Grant Date Fair Value
Unvested at January 1, 2018	190	$ 4.33
Awarded	56	4.22
Vested	(95)	4.33
Unvested at December 31, 2018	151	$ 4.29

Based upon application of the Black-Scholes option-pricing formula described below, the weighted-average grant-date fair value of options granted during the years ended December 31, 2018 and 2017 was $3.39 and $17.44, respectively. The weighted-average grant-date fair value of RSUs granted during the years ended December 31, 2018 and 2017 was $4.22 and $4.33, respectively. The total intrinsic value of options outstanding, vested, and exercisable as of December 31, 2018 are each $0.

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Stock-Based Compensation

We recognized stock-based compensation expense in accordance with ASC Topic 718 of $1.0 million and $1.6 million, respectively, for each of the years ended December 31, 2018 and 2017.

Stock-based compensation expense was classified as follows:

(in thousands)	Year Ended December 31, 2018	2017
Research and development	$ 232	$ 837
Selling, general and administrative	723	724
Total	$ 955	$ 1,561

Under the 2011 Plan, except as may be provided in an award agreement or an employment agreement, outstanding awards fully vest upon a change in control. Concurrent with the execution of the share purchase agreement with LPH in October 2017 (*see*, Note 14 – Stockholders' Equity – Private Placement Offerings) and the resulting change in control, all outstanding awards under the 2011 Plan, except as provided for in agreements for certain executive officers, fully vested and resulted in a $0.4 million charge to stock based compensation expense in 2017.

The fair value of each option award is estimated on the date of grant using the Black-Scholes option-pricing formula that uses assumptions noted in the following table. Expected volatilities are based upon the historical volatility of our common stock and other factors. We also use historical data and other factors to estimate option exercises, employee terminations and forfeiture rates. The risk-free interest rates are based upon the US Treasury yield curve in effect at the time of the grant.

	Year Ended December 31, 2018	2017
Weighted average expected volatility	93%	79%
Weighted average expected term (in years)	7.0	6.6
Weighted average risk-free interest rate	2.7%	2.2%
Expected dividends	-	-

The total fair value of the underlying shares of the options vested during 2018 and 2017 equals $0.6 million and $1.9 million, respectively. As of December 31, 2018, there was $13.9 million of total unrecognized compensation cost related to non-vested share-based compensation arrangements granted under the 2011 Plan. That cost is expected to be recognized over a weighted-average vesting period of 2.9 years.

Note 16 – Collaboration, Licensing and Research Funding Agreements

Collaboration Agreement

Battelle Memorial Institute

In October 2014, we entered into a Collaboration Agreement with Battelle Memorial Institute (Battelle) for the development of our phase 3 ADS. We had previously worked with Battelle, which has expertise in developing and integrating aerosol devices using innovative and advanced technologies, in connection with development of our prototype phase 2 ADS used in the AEROSURF phase 2b clinical trial. Under the Collaboration Agreement, we and Battelle shared the costs of development for a three-stage development plan that included (i) defining the requirements and a detailed project plan for a phase 3 ADS, (ii) executing the project plan, and (iii) completing required testing, verification and documentation, putting us in a position to manufacture a phase 3 ADS for use in the remaining AEROSURF development activities and, if approved, the initial commercial activities. We retained final decision-making authority over all matters related to the design, registration, manufacture, packaging, marketing, distribution and sale of the phase 3 ADS. We and Battelle shared equally the costs of the first stage and the planned costs of the remaining two stages. Battelle agreed to bear the cost of any cost overruns associated with the project plan and we agreed to bear the cost of any increase in cost resulting from changes in the scope of the product requirements. We also agreed that, if Battelle successfully completed the project plan in a timely manner, we would pay Battelle royalties equal to a low single-digit percentage of the worldwide net sales and license royalties on sales of AEROSURF for the treatment of RDS in premature infants, up to an initial aggregate limit of $25 million, which under the Battelle Payment Restructuring (discussed below) was increased to $35 million. The Collaboration Agreement will end at the time we fulfill our payment obligations to Battelle, unless sooner terminated by a party as provided therein.

In December 2018, we and Battelle entered into a Payment Restructuring Agreement. *See*, Note 9 – Collaboration and Device Development Payable, regarding the December 2018 Payment Restructuring Agreement.

Licensing and Research Funding Agreements

Lee's Pharmaceutical (HK) Ltd.

In June 2017, we entered into a License, Development and Commercialization Agreement (License Agreement) with Lee's Pharmaceutical (HK) Ltd., a company organized under the laws of Hong Kong (Lee's (HK)) and an affiliate of Lee's. Under the License Agreement, we granted to Lee's (HK) an exclusive license with a right to sublicense (i) to develop and commercialize our KL4 surfactant products, including SURFAXIN, which was approved by the FDA in 2012 for respiratory distress syndrome (RDS) in premature infants, SURFAXIN LS™, the lyophilized dosage form of SURFAXIN, and AEROSURF, and (ii) to register and manufacture SURFAXIN and SURFAXIN LS for use in the licensed territory, which includes the People's Republic of China ("PRC"), Hong Kong, Thailand, Taiwan and 12 other countries. In addition, we granted Lee's (HK) options to potentially add Japan to the Licensed Territory, which was made effective in an August 2017 amendment (License Amendment, discussed below) and to manufacture our ADS in the licensed territory, in each case subject to conditions set forth in the License Agreement.

Under the License Agreement, Lee's made an upfront payment to us of $1 million. We also may receive up to $37.5 million in potential clinical, regulatory and commercial milestone payments and will share in any sublicense income Lee's may receive at a rate equal to low double digits. In addition, Lee's will be responsible for all costs and expenses in and for the Licensed Territory related to development activities, including a planned AEROSURF phase 3 clinical trial, regulatory activities, and commercialization activities.

In August 2017, we entered into a Loan Agreement, pursuant to which Lee's (HK) agreed to lend us up to $3.9 million to support our activities through October 31, 2017, while we and Lee's worked to complete a $10 million securities purchase agreement (Lee's SPA) pursuant to which Lee's acquired a controlling interest in our common stock on November 1, 2017. In connection with Lee's SPA, we amended the License Agreement to expand certain of Lee's (HK) rights, including by immediately adding Japan to the licensed territory, accelerating the right to manufacture the ADS in and for the licensed territory, reducing or eliminating certain of the milestone and royalty payments and adding an affiliate of Lee's (HK) as a party to the License Agreement. As a result, the additional amounts for potential clinical, regulatory and commercial milestone were reduced to $35.8 million.

We will be eligible to receive tiered royalties based on a percent of Net Sales, depending on the product, in the range of high single to low-to-mid double-digit percentages. Royalties are payable on a country-by-country basis until the latest of (A) the expiration of the last valid patent claim covering the product in the country of sale, (B) the expiration or revocation of any applicable regulatory exclusivity in the country of sale, and (C) ten (10) years after the first commercial sale in the country of sale. Thereafter, in consideration of licensed rights other than patent rights, royalties shall continue for the commercial life of each product and, for the initial three years, shall be in the range of low-to-mid single digits. In addition, in the event that one or more generic products are introduced, the royalty rates will be reduced, subject to certain minimums if we are subject to continuing obligations at the time to pay royalties under our in-license agreements.

Under the License Agreement, Lee's will be responsible for all activities related to development, regulatory approval and commercialization of KL4 surfactant and combination drug / device products in the Licensed Territory. Lee's will hold the product licenses for all non-aerosolized products in the Licensed Territory and will seek regulatory approval initially for SURFAXIN and SURFAXIN LS for RDS. We will hold the product license in the Licensed Territory (except where prohibited by law) for all aerosolized products and will designate Lee's its exclusive agent and representative to develop and register AEROSURF and other aerosolized products in our name and on our behalf. Lee's also has agreed that, except as provided in the License Agreement, for a period of ten (10) years beginning with the later of the first commercial sale of the first aerosolized product and the first commercial sale of the first non-aerosolized product in the PRC, it will not develop, register, manufacture, or commercialize any product for the prevention and/or treatment of RDS in premature infants or other diseases and conditions in humans, in either case that administers, utilizes or contains pulmonary surfactant without our prior written consent.

Accounting Analysis under ASC 606

In evaluating the License Agreement in accordance with ASC Topic 606, we concluded that the contract counterparty, Lee's (HK), is a customer. We identified the following performance obligations: (i) a bundled performance obligation consisting of licensing rights to develop and commercialize our KL4 surfactant products and a technology transfer process for the manufacture of SURFAXIN and SURFAXIN LS; and (ii) a technology transfer process for the manufacture of our ADS. We determined that participation in the Joint Steering Committee (and other committees under its authority) and our ongoing product development, regulatory, and commercialization activities under the License Agreement were deemed immaterial in the context of the contract. Consistent with the guidance under ASC 606-10-25-16A, we disregarded immaterial promised goods and services when determining performance obligations.

We concluded that the licensing rights were not distinct within the context of the contract (i.e. separately identifiable) because the licensing rights do not have stand-alone value from other promised goods and services as Lee's (HK) could not benefit from the licensing rights without the completion of the technology transfer process for the manufacture of SURFAXIN and SURFAXIN LS. The ADS manufacturing right and the technology transfer process for the manufacture of our ADS are distinct within the context of the contract because each has stand-alone value from other promised goods and services as Lee's (HK) could benefit from each of these rights on a stand-alone basis. However, we determined that the ADS manufacturing right and the ADS technology transfer process have nominal stand-alone selling prices as the ADS is not yet verified and there is uncertainty with regard to the commercial value of the ADS given that the AEROSURF combination drug/device product is currently in clinical development.

With respect to Amendment No. 1, we elected to use the practical expedient for contract modifications that occur prior to the adoption of ASU 2014-09, and we determined that the impact was immaterial. Allocable arrangement consideration under the practical expedient comprised the upfront payment of $1 million and $0.3 million related to reductions in royalties and milestones in connection with Amendment No. 1. The $1.3 million was attributed in its entirety to the bundled performance obligation of licensing rights to develop and commercialize our KL4 surfactant products and a technology transfer process for the manufacture of SURFAXIN and SURFAXIN LS. Revenue associated with the bundled performance obligation was recognized beginning in November 2017 with the initiation of the technology transfer process for the manufacture of SURFAXIN and SURFAXIN LS and will be recognized over time as services are performed and based on the input method related to the level of effort expended. The expected completion date for the technology transfer is June 2019.

Regulatory and commercialization milestones were excluded from the transaction price, as all milestone amounts were fully constrained under the guidance. As part of our evaluation of the constraint, we considered a number of factors in determining whether there is significant uncertainty associated with the future events that would result in the milestone payments. Those factors include: our financial position; ongoing delays in our development activities and with initiating our phase 3 clinical trial; our limited experience with successful drug development; our limited experience with clinical trials; our recent failure to achieve primary endpoints in our phase 2b clinical trial; our limited experience with commercialization; our decision in 2015 to cease manufacturing and commercializing of SURFAXIN; and the fact that the uncertainty about the related consideration is not expected to be resolved for a long period of time (*see*, Item 1A – Risk Factors).

Consideration related to sales-based milestones and royalties will be recognized when the related sales occur, provided that the reported sales are reliably measurable and that we have no remaining performance obligations, as such sales were determined to relate predominantly to the license granted to Lee's (HK) and therefore have also been excluded from the transaction price. We will re-evaluate the transaction price in each reporting period and as uncertain events are resolved or other changes in circumstances occur.

Philip Morris USA Inc. and Philip Morris Products S.A.

Under license agreements with Philip Morris USA Inc. (PMUSA) and Philip Morris Products S.A. (PMPSA), we hold exclusive worldwide licenses to the ADS technology for use with pulmonary surfactants (alone or in combination with any other pharmaceutical compound(s)) for all respiratory diseases and conditions (the foregoing uses in each territory, the Exclusive Field), and an exclusive license in the US for use with certain non-surfactant drugs to treat a wide range of pediatric and adult respiratory indications in hospitals and other health care institutions. We generally are obligated to pay royalties at a rate equal to a low single-digit percent of sales of products sold in the Exclusive Field (as defined in the license agreements) in the territories, including sales of aerosol devices that are not based on the capillary aerosolization technology (unless we exercise our right to terminate the license with respect to a specific indication). We also agreed to pay minimum royalties quarterly beginning in 2014, but are entitled to a reduction of future royalties in an amount equal to the excess of any minimum royalty paid over royalties actually earned in prior periods. For 2017, we paid the minimum royalty of $300,000 to PMUSA and paid $487,500 to PMPSA, which included the minimum royalty of $300,000 as well as the $187,500 in deferred 2016 payments. For 2018, we paid the minimum royalty of $400,000 to each of PMUSA and to PMPSA.

Johnson & Johnson and Ortho Pharmaceutical Corporation

We, Johnson & Johnson (J&J) and its wholly-owned subsidiary, Ortho Pharmaceutical Corporation, are parties to a license agreement granting to us an exclusive worldwide license to the J&J proprietary KL4 surfactant technology. Under the license agreement, we are obligated to pay fees of up to $2.5 million in the aggregate upon our achievement of certain milestones, primarily upon receipt of marketing regulatory approvals for certain designated products. We have paid $1.0 million to date for milestones that have been achieved including a $0.5 million milestone payment in 2012 that became due as a result of the FDA's approval of SURFAXIN. In addition, we are required to make royalty payments at different rates, depending upon type of revenue and country, in amounts in the range of a high single-digit percent of net sales (as defined in the license agreement) of licensed products sold by us or sublicensees, or, if greater, a percentage of royalty income from sublicensees in the low double digits.

Laboratorios del Dr. Esteve, S.A.

We have a strategic alliance with Laboratorios del Dr. Esteve, S.A. (Esteve) for the development, marketing and sales of a broad portfolio of potential KL4 surfactant products in Andorra, Greece, Italy, Portugal, and Spain. Antonio Esteve, Ph.D., a principal of Esteve, served as a member of our Board of Directors from May 2002 until January 2013. Esteve will pay us a transfer price on sales of our KL4 surfactant products. We will be responsible for the manufacture and supply of all of the covered products and Esteve will be responsible for all sales and marketing in the territory. Esteve is obligated to make stipulated cash payments to us upon our achievement of certain milestones, primarily upon receipt of marketing regulatory approvals for the covered products. In addition, Esteve has agreed to contribute to phase 3 clinical trials for the covered products by conducting and funding development performed in the territory. As part of a 2004 restructuring in which Esteve returned certain rights to us in certain territories (Former Esteve Territories), we agreed to pay Esteve 10% of any cash up front and milestone fees (up to a maximum aggregate of $20 million) that we receive in connection with any strategic collaborations for the development and/or commercialization of certain of our KL4 surfactant products in the Former Esteve Territories.

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARY

Università degli Studi di Milano-Bicocca

Effective April 13, 2015, CVie Therapeutics, entered into an Agreement for Scientific Collaboration with the Università degli Studi di Milano-Bicocca (Bicocca) in Milan, Italy, focused on defining the role of sarco (endo) plasmic reticulum Ca2+ -ATPase 2a (SERCA2a) and phospholamban (PLN) in modulating cardiac contraction, and discovering new small molecules to modulate SERCA2a activity or new drugs for treating chronic and acute human heart failure. The term of the collaboration agreement would have expired after three years but was extended for approximately an additional year, with option for further renewal. We are currently in discussions potentially to extend this agreement, although there can be no assurance that we will be able to achieve an extension on acceptable terms, if at all.

Under the collaboration agreement, intellectual property resulting from the collaboration, including patents and know-how, will be jointly owned by the parties. For the development of any new SERCA2a compounds and diagnostic products suitable for further clinical development, we have the option to purchase Bicocca's interest for up to 12 months after the filing of a patent application. If the option is not exercised, then the parties shall remain joint owners and each can use the intellectual property with consent of the other on terms to be defined. If we exercise an option, we have agreed to pay Bicocca (corresponding to stage of development): (i) € 0.1 million (approximately $0.1 million) upon completion and the proof of concept of biological efficacy for new compounds modulating the SERCA2a activity caused by PLN mutations; and (ii) € 1.5 million (approximately $1.7 million) upon obtaining marketing authorization in the US, EU, or China of new compounds with the corresponding companion diagnostic assay. We have also agreed to pay royalties for any purchased intellectual property arising out of the collaboration in the range of a low- to mid-single digit percent of net sales for any products sold in any country for a period of ten years from the date of the first commercial sale.

Also, under the collaboration agreement, we have provided funds aggregating € 0.2 million (approximately $0.2 million) to date to upgrade equipment and pay laboratory expenses for the renewal term expiring in 2019. We also funded several related research contracts for the period covered by the collaboration agreement. In connection with our research activities, Bicocca agreed to provide us exclusive use of a research laboratory for the collaboration, and nonexclusive access to a physiology laboratory within the university. Bicocca serves as our primary location in Milan.

Note 17 – Related Party Transactions

Lee's Pharmaceutical Holdings Limited

As of December 31, 2018 and 2017, Lee's beneficial ownership of our issued and outstanding shares of common stock was 40% and 73%, respectively.

From June 2017 through December 2018 we entered into transactions with Lee's as follows:

- In June 2017, we entered into a licensing agreement with an affiliate of Lee's (*see*, Note 16 – Collaboration, Licensing and Research Funding Agreements)
- In October 2017, we completed a $10 million Share Purchase Agreement with an affiliate of Lee's (*see*, Note 14 – Stockholders Equity)
- During 2018, we entered into multiple loan agreements with an affiliate of Lee's (*see*, Note 11 – Loan Payable)
- In April 2018, we completed a $2.6 million private placement with an affiliate of Lee's (*see*, Note 14 – Stockholders Equity)
- In conjunction with the CVie Acquisition in December 2018, we issued shares of common stock to Lee's as a 49% shareholder in CVie Investment and entered into an indemnification letter agreement with Lee's (*see*, Note 3 – Business Combination)
- In December 2018, as part of the Private Placement Financing, we converted $6.0 million of existing loan payable obligations to the Lee's affiliate on the same economic terms as those of the other investors (*see*, Note 11 – Loan Payable)
- Our $4.5 million bank credit facility is guaranteed by Lee's (*see*, Note 11 – Loan Payable)

Panacea Venture and KPCB-China

Mr. James Huang, who in connection with the CVie Acquisition in December 2018 was appointed as a director and Chairman of our Board, is a founding and Managing Partner to Panacea Venture (Panacea) and, since 2011, has served as a Managing Partner of Kleiner Perkins Caufield & Byers (KPCB) – China. During 2018 we had the following transactions with Panacea and KCPB:

- In July 2018, we issued a $1.5 million secured convertible promissory note (Note) to an affiliate of Panacea. The Note was paid in full in December 2018 (*see*, Note 12 – Convertible Note Payable)
- In December 2018, we issued 114,415 shares of our common stock to Rui Jin (HK) Consulting Management Company Limited, an affiliate of Panacea, for services rendered before Panacea and Mr. Huang became related parties to us.
- In December 2018, conjunction with the CVie Acquisition, we issued shares of common stock to an investment fund managed by KPCB that was a 27% shareholder in CVie (*see*, Note 3 – Business Combination). Mr. Huang disclaims any beneficial interest in this KPCB investment fund.
- In December 2018, Panacea was an investor in the Private Placement Financing (*see*, Note 14 – Stockholders Equity)

As of December 31, 2018, Panacea and KPCB each had a 14% beneficial ownership of our issued and outstanding shares of common stock.

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARY

Note 18 – Commitments

Operating Leases

Our operating leases consist primarily of a facility leases for our operations in Warrington, Pennsylvania and Taipei, Taiwan.

We maintain our corporate headquarters and operations in Warrington, Pennsylvania. The facility serves as the main operating facility for drug and device development, regulatory, analytical technical services, research and development, and administration. We also maintain offices in Taipei, Taiwan, the former headquarters of CVie Therapeutics, where we perform certain manufacturing development and preclinical activities related to our cardiovascular drug product candidates.

In February 2018, we amended our Warrington, Pennsylvania lease to (i) reduce the leased space from 30,506 square feet to 21,189 square feet and (ii) reduce the security deposit under the lease in the form of a letter of credit from $225,000 to $140,000. The total aggregate base rental payments remaining under the leases as of December 31, 2018 are approximately $2.1 million.

Rent expense under these leases was $0.8 million and $0.7 million for the years ended December 31, 2018 and 2017, respectively.

Strategic and Retention Bonus

In November 2018, the Compensation Committee of our Board of Directors approved an Executive Strategic and Retention Bonus Program ("Strategic and Retention Bonus") that was intended to provide incentives to, and retain, certain key personnel while they focused on completing the CVie Acquisition and, if successful, integrating and executing an expanded business plan.

Under the terms of the Strategic and Retention Bonus, an Eligible Transaction (as that term is defined under the program) means either (a) a strategic transaction consisting of a merger that would advance our strategic needs, including by potentially allowing for diversification of our product candidates, or (b) an acquisition; and, in addition, one or more financings within a nine-month period that in the aggregate results in gross proceeds to us of at least $30 million. The Strategic and Retention Bonus payments could vary depending upon the aggregate amount raised in the financings. The maximum bonus amount would be determined by application of a multiplier to participants' 2018 base salary and would be payable only if we were to complete an Eligible Transaction with gross proceeds of at least $45 million, while the minimum bonus amount would equal 20% of the maximum bonus amount and would be payable if we were to raise at least $30 million. For other amounts raised, the maximum bonus amount would be reduced in a stepped-down fashion as provided under the program. The bonus payments, if earned, would be paid in two equal installments to support retention with the first installment due within five business days after the closing of the Eligible Transaction, and the second installment due on the nine-month anniversary of the closing of the Eligible Transaction, provided that the recipient is actively employed by us at the time of payment.

With completion of the CVie Acquisition and the $39 million Private Placement Financing on December 21, 2018, the participants became eligible to receive a total bonus of $1.4 million, of which the first installment of $0.7 million was paid in December 2018. The balance of $0.7 million will be due on the nine-month anniversary of the closing of the Eligible Transaction in September 2019.

Note 19 – Litigation

We are not aware of any pending or threatened legal actions that would, if determined adversely to us, have a material adverse effect on our business and operations.

We have from time to time been involved in disputes and proceedings arising in the ordinary course of business, including in connection with the conduct of our clinical trials. In addition, as a public company, we are also potentially susceptible to litigation, such as claims asserting violations of securities laws. Any such claims, with or without merit, if not resolved, could be time-consuming and result in costly litigation. There can be no assurance that an adverse result in any future proceeding would not have a potentially material adverse effect on our business, results of operations and financial condition.

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Note 20 – Income Taxes

Since our inception, we have never recorded a provision or benefit for federal and state income taxes.

The reconciliation of the income tax benefit computed at the federal statutory rates to our recorded tax benefit for the years ended December 31, 2018 and 2017 is as follows:

(in thousands)	December 31, 2018	2017
Income tax benefit, statutory rates	$ (4,312)	$ (6,272)
State taxes on income, net of federal benefit	(535)	(398)
Impact of tax reform	5	71,151
Research and development tax credit	(351)	(797)
Foreign rate differential	24	-
Employee related	2,875	953
Interest related	186	(147)
Income tax expense / (benefit), statutory rates	(2,108)	64,490
Valuation allowance	2,108	(64,490)
Income tax benefit, net	$ -	$ -

During 2017, we recorded tax charges for the impact of the 2017 Tax Cuts and Jobs Act (the 2017 Tax Act) effects using the current available information and technical guidance on the interpretations of the 2017 Tax Act. As permitted by SEC Staff Accounting Bulletin 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act, we recorded provisional estimates and have subsequently finalized our accounting analysis based on the guidance, interpretations, and data available as of December 31, 2018. Adjustments made in the fourth quarter of 2018 upon finalization of our accounting analysis were not material to our Consolidated Financial Statements.

The tax effects of temporary differences that give rise to deferred tax assets and deferred tax liabilities, at December 31, 2018 and 2017, are as follows:

(in thousands)	December 31, 2018	2017
Long-term deferred assets:		
Net operating loss carryforwards (federal and state)	$ 176,759	$ 168,263
Research and development tax credit	16,718	16,813
Compensation expense on stock	1,121	1,191
Charitable contribution carryforward	-	5
Other accrued	1,016	2,547
Deferred revenue	57	317
Depreciation	309	297
Total long-term deferred tax assets	195,980	189,433
Long-term deferred liabilities:		
IPR&D	(15,476)	-
Total long-term deferred tax liabilities	(15,476)	-
Valuation allowance	(195,980)	(189,433)
Deferred tax liabilities, net	$ (15,476)	$ -

We are in a net deferred tax liability position at December 31, 2018. We are in a net deferred tax asset position at December 31, 2017 before the consideration of a valuation allowance. Because we have never realized a profit, management has fully reserved the net deferred tax asset since realization is not assured. It is our policy to classify interest and penalties recognized on uncertain tax positions as a component of income tax expense. There was neither interest nor penalties accrued as of December 31, 2018 or 2017, nor were any incurred in 2018 or 2017.

At December 31, 2018 and 2017, we had available carryforward net operating losses for federal tax purposes of $606.6 million and $590.0 million, respectively, and a research and development tax credit carryforward of $16.7 million and $16.8 million, respectively. The Federal net operating loss and research and development tax credit carryforwards will continue to expire through 2037.

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARY

At December 31, 2018 and 2017, we had available carryforward losses of approximately $584.8 million and $567.7 million , respectively, for state tax purposes. Of the $583.9 million state tax carryforward losses, $570.2 million is associated with the state of Pennsylvania, with the remainder associated with the other 6 states within which we have established tax nexus.

Utilization of net operating loss (NOL) and research and development (R&D) credit carryforwards may be subject to a substantial annual limitation under Section 382 of the Internal Revenue Code of 1986 due to ownership change limitations that have occurred previously or that could occur in the future. These ownership changes may limit the amount of NOL and R&D credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. There also could be additional ownership changes in the future, which may result in additional limitations in the utilization of the carryforward NOLs and credits.

A full valuation allowance has been provided against our deferred tax assets and, if a future assessment requires an adjustment, an adjustment would be offset by an adjustment to the valuation allowance. Thus, there would be no impact to the consolidated balance sheet or statement of operations if an adjustment were required.

Note 21 – Selected Quarterly Financial Data (Unaudited)

The following tables contain unaudited statement of operations information for each quarter of 2018 and 2017. The operating results for any quarter are not necessarily indicative of results for any future period.

2018 Quarters Ended:

(in thousands, except per share data)	**Mar. 31**	**June 30**	**Sept. 30**	**Dec. 31**	**Total Year**
Revenues:					
Grant revenue	$ -	$ 695	$ 70	$ -	$ 765
License revenue with affiliate	204	356	159	304	1,023
Total revenues	204	1,051	229	304	1,788
Expenses:					
Research and development	3,118	2,879	2,197	2,368	10,562
Selling, general and administrative	1,926	1,208	1,500	2,787	7,421
Total expenses	5,044	4,087	3,697	5,155	17,983
Operating loss	(4,840)	(3,036)	(3,468)	(4,851)	(16,195)
Other income / (expense), net	328	(16)	(459)	(4,191)	(4,338)
Net (loss) / income	$ (4,512)	$ (3,052)	$ (3,927)	$ (9,042)	$ (20,533)
AEROSURF warrant dividend	-	-	-	(12,505)	(12,505)
Deemed dividend on preferred stock	-	-	-	(1,718)	(1,718)
Net (loss) / income attributable to common shareholders	$ (4,512)	$ (3,052)	$ (3,927)	$ (23,265)	$ (34,756)
Net (loss) / income per common share - basic	$ (1.40)	$ (0.81)	$ (1.04)	$ (3.24)	$ (7.74)
Net (loss) / income per common share - diluted	$ (1.40)	$ (0.81)	$ (1.04)	$ (3.24)	$ (7.74)
Weighted average number of common shares outstanding - basic	3,227	3,751	3,769	7,191	4,493
Weighted average number of common shares outstanding - diluted	3,227	3,751	3,769	7,191	4,493

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARY

2017 Quarters Ended:

(in thousands, except per share data)	Mar. 31	June 30	Sept. 30	Dec. 31	Total Year
Revenues:					
Grant revenue	$ 219	$ 1,147	$ 17	$ -	$ 1,383
License revenue with affiliate	-	-	-	102	102
Total revenues	219	1,147	17	102	1,485
Expenses:					
Research and development	6,413	5,483	3,062	2,418	17,376
Selling, general and administrative	1,922	1,804	1,749	1,182	6,657
Total expenses	8,335	7,287	4,811	3,600	24,033
Operating loss	(8,116)	(6,140)	(4,794)	(3,498)	(22,548)
Other income / (expense), net	(608)	(612)	(649)	5,971	4,102
Net (loss) / income	$ (8,724)	$ (6,752)	$ (5,443)	$ 2,473	$ (18,446)
Deemed dividend on preferred stock	(3,604)	(532)	(2,234)	-	(6,370)
Net (loss) / income attributable to common shareholders	$ (12,328)	$ (7,284)	$ (7,677)	$ 2,473	$ (24,816)
Net (loss) / income per common share - basic	$ (27.40)	$ (14.37)	$ (10.53)	$ 1.03	$ (24.14)
Net (loss) / income per common share - diluted	$ (27.40)	$ (14.37)	$ (10.53)	$ 0.97	$ (24.14)
Weighted average number of common shares outstanding - basic	450	507	729	2,405	1,028
Weighted average number of common shares outstanding - diluted	450	507	729	2,540	1,028

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WINDTREE THERAPEUTICS, INC. AND SUBSIDIARIES
Condensed Consolidated Balance Sheets
(in thousands, except share data)

	September 30, 2019	December 31, 2018
	Unaudited	
ASSETS		
Current Assets:		
Cash and cash equivalents	$ 4,437	$ 11,187
Available-for-sale marketable securities	-	13,959
Prepaid expenses and other current assets	826	507
Total current assets	5,263	25,653
Property and equipment, net	877	802
Restricted cash	154	171
Operating lease right-of-use assets	1,566	-
Intangible assets	77,090	77,090
Goodwill	15,682	15,682
Total assets	$ 100,632	$ 119,398
LIABILITIES & STOCKHOLDERS' EQUITY		
Current Liabilities:		
Accounts payable	$ 607	$ 3,420
Collaboration and device development payable, net	1,873	2,576
Accrued expenses	5,235	6,465
Operating lease liabilities - current portion	781	-
Deferred revenue	-	198
Loans payable	7,782	7,974
Total current liabilities	16,278	20,633
Operating lease liabilities - non-current portion	953	-
Restructured debt liability - contingent milestone payments	15,000	15,000
Deferred tax liabilities	15,224	15,476
Other liabilities	106	175
Total liabilities	47,561	51,284
Stockholders' Equity:		
Preferred stock, $0.001 par value; 5,000,000 shares authorized; 0 shares issued and outstanding at September 30, 2019 and December 31, 2018	-	-
Common stock, $0.001 par value; 120,000,000 shares authorized at September 30, 2019 and December 31, 2018; 32,188,929 and 32,133,263 shares issued at September 30, 2019 and December 31, 2018, respectively; 32,188,855 and 32,133,189 shares outstanding at September 30, 2019 and December 31, 2018, respectively	32	32
Additional paid-in capital	733,840	728,783
Accumulated deficit	(677,747)	(657,647)
Accumulated other comprehensive income	-	-
Treasury stock (at cost); 74 shares	(3,054)	(3,054)
Total stockholders' equity	53,071	68,114
Total liabilities & stockholders' equity	$ 100,632	$ 119,398

See notes to condensed consolidated financial statements

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARIES
Condensed Consolidated Statements of Operations
(Unaudited)

(in thousands, except per share data)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2019	**2018**	**2019**	**2018**
Revenues:				
Grant revenue	$ -	$ 70	$ -	$ 765
License revenue with affiliate	-	159	198	719
Total revenues	-	229	198	1,484
Expenses:				
Research and development	3,792	2,197	10,547	8,194
General and administrative	3,395	1,500	9,990	4,634
Total operating expenses	7,187	3,697	20,537	12,828
Operating loss	(7,187)	(3,468)	(20,339)	(11,344)
Other income / (expense):				
Interest income	25	1	124	9
Interest expense	(105)	(460)	(358)	(642)
Other income, net	141	-	473	486
Other income / (expense), net	61	(459)	239	(147)
Net loss	$ (7,126)	$ (3,927)	$ (20,100)	$ (11,491)
Net loss per common share				
Basic and diluted	$ (0.22)	$ (1.04)	$ (0.62)	$ (3.21)
Weighted average number of common shares outstanding				
Basic and diluted	32,189	3,769	32,173	3,585

See notes to condensed consolidated financial statements

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARIES
Condensed Consolidated Statements of Comprehensive Loss
(Unaudited)

(in thousands)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2019	**2018**	**2019**	**2018**
Net loss	$ (7,126)	$ (3,927)	$ (20,100)	$ (11,491)
Other comprehensive income:				
Unrealized gain (loss) on marketable securities	(12)	-	-	-
Comprehensive loss	$ (7,138)	$ (3,927)	$ (20,100)	$ (11,491)

See notes to condensed consolidated financial statements

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARIES
Condensed Consolidated Statements of Changes in Stockholders' Equity
(Unaudited)

(in thousands)

	Preferred Stock		Common Stock					Treasury Stock		
	Shares	Amount	Shares	Amount	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income	Shares	Amount	Total
Balance - December 31, 2017	**3**	**$ -**	**3,227**	**$ 3**	**$ 616,245**	**$ (637,114)**	**$ -**	**-**	**$ (3,054)**	**$ (23,920)**
Net Loss						(4,512)				(4,512)
Share Purchase Agreement, April 2018					(52)					(52)
Stock-based compensation expense					418					418
Balance - March 31, 2018	**3**	**$ -**	**3,227**	**$ 3**	**$ 616,611**	**$ (641,626)**	**$ -**	**-**	**$ (3,054)**	**$ (28,066)**
Net Loss						(3,052)				(3,052)
Issuance of common stock, Share Purchase Agreement, April 2018			542	1	2,593					2,594
Stock-based compensation expense					140					140
Balance - June 30, 2018	**3**	**$ -**	**3,769**	**$ 4**	**$ 619,344**	**$ (644,678)**	**$ -**	**-**	**$ (3,054)**	**$ (28,384)**
Net Loss						(3,927)				(3,927)
Issuance of warrants, equity consideration in debt issuance					833					833
Stock-based compensation expense					145					145
Balance - September 30, 2018	**3**	**$ -**	**3,769**	**$ 4**	**$ 620,322**	**$ (648,605)**	**$ -**	**-**	**$ (3,054)**	**$ (31,333)**

	Preferred Stock		Common Stock					Treasury Stock		
	Shares	Amount	Shares	Amount	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income	Shares	Amount	Total
Balance - December 31, 2018	**-**	**$ -**	**32,133**	**$ 32**	**$ 728,783**	**$ (657,647)**	**$ -**	**-**	**$ (3,054)**	**$ 68,114**
Net Loss						(6,537)				(6,537)
Vesting of restricted stock units			56							-
Withholding tax payments related to net share settlements of restricted stock units					(151)					(151)
Stock-based compensation expense					1,530					1,530
Unrealized gain (loss) on marketable securities							40			40
Balance - March 31, 2019	**-**	**$ -**	**32,189**	**$ 32**	**$ 730,162**	**$ (664,184)**	**$ 40**	**-**	**$ (3,054)**	**$ 62,996**
Net Loss						(6,437)				(6,437)
Stock-based compensation expense					1,739					1,739
Unrealized gain (loss) on marketable securities							(28)			(28)
Balance - June 30, 2019	**-**	**$ -**	**32,189**	**$ 32**	**$ 731,901**	**$ (670,621)**	**$ 12**	**-**	**$ (3,054)**	**$ 58,270**
Net Loss						(7,126)				(7,126)
Stock-based compensation expense					1,939					1,938
Unrealized gain (loss) on marketable securities							(12)			(12)
Balance - September 30, 2019	**-**	**$ -**	**32,189**	**$ 32**	**$ 733,840**	**$ (677,747)**	**$ -**	**-**	**$ (3,054)**	**$ 53,071**

See notes to condensed consolidated financial statements

WINDTREE THERAPEUTICS, INC. AND SUBSIDIARIES
Condensed Consolidated Statements of Cash Flows
(Unaudited)

(in thousands)

	Nine Months Ended September 30,	
	2019	**2018**
Cash flows from operating activities:		
Net loss	$ (20,100)	$ (11,491)
Adjustments to reconcile net loss to net cash used in operating activities:		
Recognition of deferred revenue	(198)	(789)
Depreciation	178	121
Amortization of operating lease right-of-use assets	741	-
Amortization of debt discount	127	303
Stock-based compensation	5,208	703
Realized gain on investments	(75)	-
Gain on sale of property and equipment	-	(9)
Changes in:		
Prepaid expenses and other current assets	389	23
Accounts payable	(2,813)	1,471
Collaboration and device development payable	(830)	146
Accrued expenses	(1,166)	(68)
Operating lease liabilities	(784)	-
Other liabilities	119	-
Net cash used in operating activities	(19,204)	(9,590)
Cash flows from investing activities:		
Proceeds from sale of marketable securities	13,988	-
Purchase of property and equipment	(129)	-
Proceeds from sale of property and equipment	-	9
Net cash provided by investing activities	13,859	9
Cash flows from financing activities:		
Proceeds from loan payable, net of expenses	-	4,280
Proceeds from private placement issuance of securities, net of expenses		2,541
Proceeds from convertible note payable	-	1,500
Principle payments on loans payable	(820)	-
Payment for taxes related to net share settlements of restricted stock units	(151)	-
Net cash (used in) / provided by financing activities	(971)	8,321
Effect of exchange rate changes on cash and cash equivalents	(451)	-
Net decrease in cash and cash equivalents	(6,767)	(1,260)
Cash, cash equivalents and restricted cash - beginning of period	11,358	2,040
Cash, cash equivalents and restricted cash - end of period	$ 4,591	$ 780
Supplementary disclosure of non-cash activity:		
Prepayment of director and officer insurance through 3rd party financing	$ 708	$ -

See notes to condensed consolidated financial statements

Notes to Condensed Consolidated Financial Statements (unaudited)

Note 1 – The Company and Description of Business

Windtree Therapeutics, Inc. (referred to as "we," "us," or the "Company") is a biotechnology and medical device company focused on developing drug product candidates and medical device technologies to address acute cardiovascular and pulmonary diseases. Through 2018, we focused on the development of our proprietary KL4 surfactant technology and aerosol delivery system (ADS) technology for the treatment and/or prevention of respiratory distress syndrome (RDS) in premature infants. In December 2018, we entered into an Agreement and Plan of Merger (the CVie Acquisition) with CVie Investments Limited (CVie Investments), an exempted company with limited liability incorporated under the laws of the Cayman Islands. We have operated CVie Investments, and its wholly-owned subsidiary, CVie Therapeutics Limited (CVie Therapeutics), a Taiwan corporation organized under the laws of the Republic of China, as a business division (these entities may be collectively referred to herein as CVie) focused on development of drug product candidates for cardiovascular diseases, including acute heart failure and hypertension and associated organ dysfunction.

Our four lead development programs are (1) istaroxime for treatment of (a) acute heart failure (AHF) and (b) early cardiogenic shock, (2) AEROSURF® (lucinactant for inhalation) for non-invasive delivery of our lyophilized KL4 surfactant to treat RDS in premature infants, (3) lyophilized KL4 surfactant intratracheal suspension for RDS, and (4) rostafuroxin for genetically associated hypertension. We are currently preparing for a study assessing the utility of istaroxime in early cardiogenic shock, as well as phase 2 clinical studies of istaroxime in acute heart failure and AEROSURF in RDS potentially to transition thereafter to phase 3. We also continue with our preclinical activities for follow-on oral and intravenous SERCA 2a heart failure compounds; however, we have slowed the pace of these activities while we seek the additional capital required to support our development activities and operations. *See*, "Note 3 – Liquidity Risks and Management's Plans."

The reader is referred to, and encouraged to read in its entirety, Item 1 – Business in our Annual Report on Form 10-K for the year ended December 31, 2018 that we filed with the Securities and Exchange Commission (SEC) on April 16, 2019, as amended by the Form 10-K/A that we filed with the SEC on April 23, 2019 (collectively, 2018 Form 10-K), and our Quarterly Reports on Form 10-Q filed thereafter, which contain discussions of our business and business plans, as well as information concerning our proprietary technologies and our current and planned development programs.

Note 2 – Basis of Presentation

These interim unaudited condensed consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the US (US GAAP) for interim financial information in accordance with the instructions to Form 10-Q and include accounts of Windtree and its wholly-owned subsidiaries. Accordingly, they do not include all of the information and footnotes required by US GAAP for complete consolidated financial statements. Intercompany balances and transactions have been eliminated in consolidation. In the opinion of management, all adjustments (consisting of normally recurring accruals) considered for fair presentation have been included. When necessary, the prior year interim unaudited condensed consolidated financial statements have been reclassified to conform to the current year presentation. Operating results for the three and nine months ended September 30, 2019 are not necessarily indicative of the results that may be expected for the year ending December 31, 2019. There have been no changes to our critical accounting policies since December 31, 2018. The accompanying interim unaudited condensed consolidated financial statements should be read in conjunction with annual audited financial statements and related notes as of and for the year ended December 31, 2018 contained in our 2018 Form 10-K and our Quarterly Reports on Form 10-Q filed thereafter.

Note 3 – Liquidity Risks and Management's Plans

As of September 30, 2019, we had cash and cash equivalents of $4.4 million and current liabilities of $16.3 million, including $7.8 million of Loans payable (*see*, Note 7 - Loans Payable). On October 24, 2019, LPH II Investments Ltd. (LPH II), an affiliate of Lee's Pharmaceutical Holdings Limited, agreed to lend the Company $1.0 million to fund the Company's operations, on an interim basis. We believe that, including the LPH II loan, we currently have cash and cash equivalent resources to fund our business operations through late-November 2019 while maintaining minimum cash resources to provide for an orderly shutdown of operations, if required.

We have an immediate need for additional capital to continue our operations. Even if we are able to secure such additional capital in the near term, we expect to continue to incur significant losses and will require significant additional capital to support our operations, advance our clinical development programs, and satisfy existing obligations. We currently only have cash and cash equivalent resources to fund our business operations through late-November 2019, and we do not currently have sufficient cash and cash equivalents for at least the next year following the date that the financial statements are issued. These conditions raise substantial doubt about our ability to continue as a going concern within one year after the date that the financial statements are issued.

To alleviate the conditions that raise substantial doubt about our ability to continue as a going concern, management plans, and is currently actively engaged in discussions with various parties, including our largest shareholders, seeking to secure additional capital, potentially through one or a combination of public or private equity offerings and strategic transactions, including potential alliances and drug product collaborations focused on specified geographic markets; however, none of these alternatives are committed at this time. There can be no assurance that we will be able to raise the required capital before our cash is exhausted, with acceptable terms and in an amount required to support our plans and operations, or identify and enter into any strategic transactions that would provide the capital that we will require or, if we do raise capital, it may not be in an amount sufficient to support all of our planned activities and we would therefore need to prioritize and potentially curtail certain programs. If none of these alternatives is available, or if available, we are unable to raise sufficient capital through such transactions, our current cash and cash equivalent resources is only adequate to fund our business operations through late-November 2019 and we will not have sufficient cash resources and liquidity to fund our business operations for at least the next year following the date that the financial statements are issued. Accordingly, management has concluded that substantial doubt exists with respect to our ability to continue as a going concern through one year after the issuance of the accompanying financial statements.

The accompanying financial statements have been prepared on a going concern basis, which contemplates the realization of assets and satisfaction of liabilities in the normal course of business, and do not include any adjustments relating to recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might be necessary should we be unable to continue as a going concern.

As of September 30, 2019, there were 120.0 million shares of common stock and 5.0 million shares of preferred stock authorized under our Certificate of Incorporation, and approximately 72.0 million shares of common stock and 5.0 million shares of preferred stock available for issuance and not otherwise reserved.

Note 4 – Summary of Significant Accounting Policies

Principles of Consolidation

The condensed consolidated financial statements are prepared in accordance with accounting principles generally accepted in the US (US GAAP) and include accounts of Windtree Therapeutics, Inc. and its wholly-owned subsidiaries, CVie Investments, CVie Therapeutics, and a presently inactive subsidiary, Discovery Laboratories, Inc.

Business Combinations

We follow the acquisition method for an acquisition of a business where the purchase price is allocated to the assets acquired and liabilities assumed based on their estimated fair values at the dates of acquisition. The excess of the fair value of purchase consideration over the fair value of the assets acquired and liabilities assumed is recorded as goodwill. Such valuations require management to make significant estimates and assumptions, especially with respect to intangible assets. Management's estimate of fair value is based upon assumptions believed to be reasonable, but which are inherently uncertain and unpredictable and as such, actual results may differ materially from estimates.

Goodwill and Intangible Assets

We record acquired identified intangibles, which includes intangible assets (such as goodwill and other intangibles), based on estimated fair value. The acquired in-process research and development (IPR&D) assets are considered indefinite-lived intangible assets until completion or abandonment of the associated research and development efforts. IPR&D is not amortized but reviewed for impairment at least annually, or when events or changes in the business environment indicate the carrying value may be impaired. The following table represents identifiable intangible assets as of September 30, 2019 and December 31, 2018:

(in thousands)		**Carrying Value**
Istaroxime drug candidate	$	22,340
Rostafuroxin drug candidate		54,750
Total	$	77,090

Goodwill represents the excess of the purchase price over the fair value of assets acquired and liabilities assumed in a business combination and is not amortized. We perform an annual impairment test for goodwill and evaluate the recoverability whenever events or changes in circumstances indicate that the carrying value of goodwill may not be fully recoverable. In making such an assessment, qualitative factors are used to determine whether it is more likely than not that our fair value is less than our carrying value. If the estimated fair value is less than our carrying value, then an impairment loss is recorded.

Foreign Currency Transactions

The functional currency for our foreign subsidiaries is US dollars. We remeasure monetary assets and liabilities that are not denominated in the functional currency at exchange rates in effect at the end of each period. Gains and losses from the remeasurement of foreign currency transactions are recognized in other income (expense). Foreign currency transactions resulted in gains of approximately $0.1 million and $0.4 million for the three and nine months ended September 30, 2019. There were no foreign currency transaction gains or losses for the three and nine months ended September 30, 2018.

Use of Estimates

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

Marketable Securities

Marketable securities consist of investments in US Treasury securities. Management determines the appropriate classification of these securities at the time they are acquired and evaluates the appropriateness of such classifications at each balance sheet date. We classify investments as available-for-sale pursuant to Financial Accounting Standards Board (FASB) Accounting Standard Codification (ASC) 320, Investments—Debt and Equity Securities. Investments are recorded at fair value, with unrealized gains and losses included as a component of accumulated other comprehensive loss in stockholders' equity and a component of total comprehensive loss in the condensed consolidated statements of comprehensive loss, until realized. Realized gains and losses are included in other income (expense) on a specific-identification basis. For the three months ended September 30, 2019, we had $14,000 in realized gains and $12,000 in unrealized losses on marketable securities. For the nine months ended September 30, 2019, we had $75,000 in realized gains and our unrealized gains and losses on marketable securities netted to zero. There were no realized or unrealized gains or losses on investments for the three and nine months ended September 30, 2018.

We review investments for other-than-temporary impairment whenever the fair value of an investment is less than the amortized cost and evidence indicates that an investment's carrying amount is not recoverable within a reasonable period of time. Other-than-temporary impairments of investments are recognized in the condensed consolidated statements of operations if we have experienced a credit loss, have the intent to sell the investment, or if it is more likely than not that we will be required to sell the investment before recovery of the amortized cost basis. Evidence considered in this assessment includes reasons for the impairment, compliance with our investment policy, the severity and the duration of the impairment and changes in value subsequent to the end of the period.

Available-for-sale marketable securities are classified as marketable securities, current or marketable securities, non-current depending on the contractual maturity date of the individual available-for-sale security.

Leases

Effective January 1, 2019, we adopted ASC Topic 842, *Leases* (ASC 842), using the modified retrospective transition approach and utilizing the effective date as the date of initial application. Consequently, prior period balances and disclosures have not been restated and are presented in accordance with the previous guidance in ASC Topic 840, *Leases*.

At the inception of an arrangement, we determine whether an arrangement is, or contains, a lease based on the unique facts and circumstances present in the arrangement. An arrangement is, or contains, a lease if the arrangement conveys the right to control the use of an identified asset for a period of time in exchange for consideration. Leases with a term greater than one year are generally recognized on the balance sheet as operating lease right-of-use assets and current and non-current operating lease liabilities, as applicable. We elected not to recognize on the balance sheet leases with terms of 12 months or less. We typically only include the initial lease term in our assessment of a lease arrangement. Options to extend a lease are not included in our assessment unless there is reasonable certainty that we will renew.

Operating lease liabilities and their corresponding operating lease right-of-use assets are recorded based on the present value of lease payments over the expected remaining lease term. Certain adjustments to the right-of-use asset may be required for items such as incentives received. The interest rate implicit in our leases is typically not readily determinable. As a result, we utilize our incremental borrowing rate, which reflects the fixed rate at which we could borrow on a collateralized basis the amount of the lease payments in the same currency, for a similar term, in a similar economic environment. In transition to ASC 842, we utilized the remaining lease term of our leases in determining the appropriate incremental borrowing rates.

Restructured Debt Liability – Contingent Milestone Payment

In conjunction with the November 2017 restructuring and retirement of long-term debt (*see*, Note 8 – Restructured Debt Liability), we established a $15 million long-term liability for contingent AEROSURF regulatory and commercial milestone payments, beginning with the filing for marketing approval in the United States, potentially due under the Exchange and Termination Agreement dated as of October 27, 2017 (Exchange and Termination Agreement), between ourselves and affiliates of Deerfield Management Company L.P. (Deerfield). The liability has been recorded at full value of the contingent milestones and will continue to be carried at full value until the milestones are achieved and paid or milestones are not achieved and the liability is written off as a gain on debt restructuring.

Research and Development

We account for research and development expense by the following categories: (a) product development and manufacturing, (b) clinical medical and regulatory operations, and (c) direct preclinical and clinical development programs. Research and development expense includes personnel, facilities, manufacturing and quality operations, pharmaceutical and device development, research, clinical, regulatory, other preclinical and clinical activities and medical affairs. Research and development costs are charged to operations as incurred in accordance with ASC Topic 730, *Research and Development*.

Net Loss per Common Share

Basic net loss per share is computed by dividing net loss by the weighted average number of common shares outstanding for the period. Diluted net loss per common share is computed by giving effect to all potentially dilutive securities outstanding for the period. As of September 30, 2019 and 2018, the number of shares of common stock potentially issuable upon the conversion of preferred stock or exercise of certain stock options and warrants was 15.6 million and 1.3 million shares, respectively. For the three and nine months ended September 30, 2019 and 2018, all potentially dilutive securities were anti-dilutive and therefore have been excluded from the computation of diluted net loss per share.

Income Taxes

We account for income taxes in accordance with ASC Topic 740, *Accounting for Income Taxes*, which requires the recognition of deferred tax liabilities and assets for the expected future tax consequences of temporary differences between financial statement carrying amounts and the tax basis of assets and liabilities.

We use a recognition threshold and measurement attribute for the financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. Because we have never realized a profit, management has fully reserved the net deferred tax asset since realization is not assured.

Recently Adopted Accounting Standards

In February 2016, the FASB issued Accounting Standards Update (ASU) No. 2016-02, *Leases* (ASU 2016-02). ASU 2016-02 establishes ASC 842 which amends ASC 840, *Leases*, by introducing a lessee model that requires balance sheet recognition for most leases and the disclosure of key information about leasing arrangements. ASC 842 was subsequently amended during 2018. Leases will be classified as finance or operating, with classification affecting the pattern and classification of expense recognition in the income statement. We adopted the new standard using the required modified retrospective approach on January 1, 2019 and used the effective date as its date of initial application. Consequently, financial information is not updated and the disclosures required under the new standard are not provided for dates and periods prior to January 1, 2019. Instead, the requirements of ASC 840 are presented for these prior periods.

ASC 842 provides several optional practical expedients in transition. We elected the package of practical expedients which allowed us to not reassess our existing conclusions on lease identification, classification, and initial direct costs. Further, we elected to utilize the short-term lease exemption for all leases with an original term of 12 months or less, for purposes of applying the recognition and measurement requirements of the new standard. We also elected the practical expedient to not separate lease and non-lease components for all our leases.

The adoption of this standard resulted in the recognition of operating lease liabilities and related right-of-use assets on our condensed consolidated balance sheets of $2.2 million and $2.0 million, respectively, related to our operating leases. The adoption of ASC 842 also resulted in the elimination of deferred rent of approximately $72,000 and $139,000 in accrued expenses and other long-term liabilities, respectively, in our condensed consolidated balance sheets. The adoption of the standard did not have a material impact on our condensed consolidated statements of operations and comprehensive loss or condensed consolidated statements of cash flows. Refer to Note 10 – Leases, for our current lease commitments.

In January 2017, the FASB issued ASU No. 2017-04, "Intangibles-Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment." The new standard simplifies the subsequent measurement of goodwill by eliminating the second step of the goodwill impairment test. This ASU will be applied prospectively and is effective for annual or interim goodwill impairment tests in fiscal years beginning after December 15, 2019 with early adoption permitted. We adopted this guidance on January 1, 2019 and will apply it to our annual impairment test, and any interim impairment tests during the year ending December 31, 2019.

Recently Issued Accounting Standards

In August 2018, the FASB issued ASU No. 2018-13, "Fair Value Measurement (Topic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement" (ASU 2018-13), which removes, adds and modifies certain disclosure requirements for fair value measurements in Topic 820. Companies will no longer be required to disclose the amount of and reasons for transfers between Level 1 and Level 2 of the fair value hierarchy as well as the valuation processes of Level 3 fair value measurements. However, companies will be required to additionally disclose the changes in unrealized gains and losses included in other comprehensive income for recurring Level 3 fair value measurements and the range and weighted average of assumptions used to develop significant unobservable inputs for Level 3 fair value measurements. ASU 2018-13 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. The amendments relating to additional disclosure requirements will be applied prospectively for only the most recent interim or annual period presented in the initial year of adoption. All other amendments will be applied retrospectively to all periods presented upon their effective date. We are currently evaluating the impact that the adoption of ASU 2018-13 will have on our condensed consolidated financial statements.

Note 5 – License Revenue with Affiliate

(in thousands)	Three Months Ended September 30, 2019	Three Months Ended September 30, 2018	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
License revenue with affiliate	$ -	$ 159	$ 198	$ 719

License revenue with affiliate represents revenue from a License Agreement with Lee’s Pharmaceutical (HK) Ltd. (Lee’s (HK)), an affiliate of our largest shareholder, Lee’s Pharmaceutical Holdings Limited (Lee’s), and constitutes a contract with a customer accounted for in accordance with ASC Topic 606. As of June 30, 2019, all revenue related to the License Agreement was recognized and no future material performance obligations are due.

Note 6 – Fair Value of Financial Instruments

Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date.

Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. The fair value hierarchy is based on three levels of inputs, of which the first two are considered observable and the last unobservable, as follows:

- Level 1 – Quoted prices in active markets for identical assets and liabilities.
- Level 2 – Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.
- Level 3 – Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

Fair Value on a Recurring Basis

The tables below categorize assets and liabilities measured at fair value on a recurring basis for the periods presented:

(in thousands)	Fair Value September 30, 2019	Fair value measurement using Level 1	Level 2	Level 3
Assets:				
Cash and cash equivalents	$ 4,437	$ 4,437	$ -	$ -
U.S. Treasury notes	-	-	-	-
Certificate of deposit	154	154	-	-
Total Assets	$ 4,591	$ 4,591	$ -	$ -

(in thousands)	Fair Value December 31, 2018	Fair value measurement using Level 1	Level 2	Level 3
Assets:				
Cash and cash equivalents	$ 5,234	$ 5,234	$ -	$ -
U.S. Treasury notes	19,912	19,912	-	-
Certificate of deposit	171	171	-	-
Total Assets	$ 25,317	$ 25,317	$ -	$ -

Note 7 – Loans Payable

In January 2018 and March 2018, LPH Investments Limited (LPH), an affiliate of Lee's, agreed to lend us $1.5 million and $1.0 million, respectively, to support our AEROSURF development activities and sustain our operations while we sought to identify and advance one or more potential strategic initiatives as defined in the related loan agreements (Funding Event). The loans accrued interest at a rate of 6% per annum and would mature upon the earlier of the closing date of the Funding Event or December 31, 2018. To secure our obligations under these loans, we granted LPH a security interest in substantially all our assets pursuant to the terms of a Security Agreement dated March 1, 2018 (LPH Security Agreement). Effective December 5, 2018, LPH assigned all outstanding loans to us to LPH II Investment Limited (LPH II), a subsidiary of Lee's. In connection with the Private Placement Financing, we converted to equity $6.0 million of the then outstanding loan payable obligations to LPH II on the same terms as those of the investors in the private placement. Included in the conversion were the $1.5 million and $1.0 million loans and following this conversion of the loans into equity securities, the security interest granted under the LPH Security Agreement was discharged.

Assumption of bank debt as part of the CVie Acquisition

As part of the CVie Acquisition, we assumed approximately $4.5 million in a bank credit facility due in March 2020.

In September 2016, CVie entered into a 12-month revolving credit facility of approximately $2.9 million with O-Bank Co., Ltd. (O-Bank) to finance operating activities. The facility was later renewed and increased to approximately $5.8 million in September 2017. The credit facility was guaranteed by Lee's, which pledged bank deposits in the amount of 110% of the actual borrowing amount. The guaranty was part of the facility; however, we do not have a written commitment from Lee's to maintain the collateral. Interest, payable in cash on a monthly basis, is determined based on 90-day TAIBOR (the Taipei Interbank Offer Rate) plus 0.91%. The credit facility expired on September 11, 2019 and the loans mature six months after the expiration date, on March 11, 2020. We have initiated a process with O-Bank potentially to extend the maturity date of the facility into 2021.

As of September 30, 2019, the outstanding principal was approximately $4.5 million.

Assumption of Lee's debt as part of the CVie Acquisition

As part of the CVie Acquisition, we assumed approximately $3.5 million of debt payable to Lee's Pharmaceutical International Limited (Lee's International).

From April 24, 2018 to November 16, 2018, CVie entered into four separate agreements to borrow an aggregate of approximately $3.5 million from Lee's International. The terms of the loan agreements are identical with interest, payable in cash upon maturity, at a rate of 4% per annum and maturing one year from the effective date of the respective loan agreement as follows: $0.5 million in April 2019; $0.3 million in September 2019; $0.2 million in October 2019; and $2.5 million in November 2019. Due to our current cash position, Lee's recently agreed in principle to defer payment of these loans until we have adequate cash resources to satisfy the outstanding obligations or no later than April 30, 2021.

During the quarter ended March 31, 2019, we made payments of $0.45 million against the April 2018 loan and paid the remaining $50,000 balance plus accrued interest in April 2019. As of September 30, 2019, the outstanding principal of the loans with Lee's International was $3.0 million.

Loan payable to Bank Direct Capital Finance

In May 2019, we entered into an insurance premium financing and security agreement with Bank Direct Capital Finance (Bank Direct). Under the agreement, we have financed $0.7 million of certain premiums at a 5.35% annual interest rate. Payments of approximately $80,000 are due monthly through March 2020. As of September 30, 2019, the outstanding principal of the loan was $0.4 million.

Note 8 – Restructured Debt Liability

(in thousands)	September 30, 2019	December 31, 2018
Restructured debt liability - contingent milestone payments	$ 15,000	$ 15,000

On November 1, 2017, we and Deerfield entered into an Exchange and Termination Agreement pursuant to which (i) promissory notes evidencing a loan with affiliates of Deerfield Management Company L.P. (Deerfield Loan) in the aggregate principal amount of $25 million and (ii) warrants to purchase up to 25,000 shares of our common stock at an exercise price of $786.80 per share held by Deerfield were cancelled in consideration for (i) a cash payment in the aggregate amount of $2.5 million, (ii) 71,111 shares of common stock, representing 2% of fully-diluted shares outstanding (as defined in the Exchange and Termination Agreement) on the closing date, and (iii) the right to receive certain milestone payments based on achievement of specified AEROSURF development and commercial milestones, which, if achieved, could potentially total up to $15 million. In addition, a related security agreement, pursuant to which Deerfield held a security interest in substantially all of our assets, was terminated. We established a $15 million long-term liability for the contingent milestone payments potentially due to Deerfield under the Exchange and Termination Agreement (*see*, Note 4 – Summary of Significant Accounting Policies). The liability has been recorded at full value of the contingent milestones and will continue to be carried at full value until the milestones are achieved and paid or milestones are not achieved and the liability is written off as a gain on debt restructuring.

Note 9 – Stock Options and Stock-Based Employee Compensation

We recognize in our condensed consolidated financial statements all stock-based awards to employees and non-employee directors based on their fair value on the date of grant, calculated using the Black-Scholes option-pricing model. Compensation expense related to stock-based awards is recognized ratably over the vesting period, which for employees is typically three years. We recognize restricted stock unit awards to employees and non-employee directors based on their fair value on the date of grant. Compensation expense related to restricted stock unit awards is recognized ratably over the vesting period, which typically has been between approximately six to 18 months.

A summary of activity under our long-term incentive plan is presented below:

(in thousands, except for weighted-average data) Stock Options	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (In Yrs)
Outstanding at January 1, 2019	4,417	$ 6.73	
Granted	1,144	4.20	
Forfeited or expired	(5)	467.57	
Outstanding at September 30, 2019	5,556	$ 5.80	9.2
Vested and exercisable at September 30, 2019	70	$ 128.45	6.3
Vested and expected to vest at September 30, 2019	5,245	$ 5.79	9.2

(in thousands, except for weighted-average data) Restricted Stock Units	Shares	Weighted-Average Grant Date Fair Value
Unvested at January 1, 2019	151	$ 4.29
Awarded	249	3.95
Vested	(95)	3.95
Cancelled	(144)	4.33
Unvested at September 30, 2019	161	$ 4.04

The fair value of each option award is estimated on the date of grant using the Black-Scholes option-pricing formula based on the following weighted average assumptions:

	Nine Months Ended September 30, 2019
Weighted average expected volatility	95%
Weighted average expected term (in years)	6.6
Weighted average risk-free interest rate	2.6%
Expected dividends	-

The table below summarizes the total stock-based compensation expense included in the condensed consolidated statements of operations for the periods presented:

(in thousands)	Three Months Ended September 30, 2019	Three Months Ended September 30, 2018	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
Research and development	$ 574	$ 29	$ 1,613	$ 169
General and administrative	1,365	116	3,595	534
Total	$ 1,939	$ 145	$ 5,208	$ 703

Note 10 – Leases

Our operating leases consist primarily of facility leases for our operations in Warrington, Pennsylvania and Taipei, Taiwan.

We maintain our corporate headquarters and operations in Warrington, Pennsylvania, with a remaining non-cancelable term of approximately three years. The facility serves as the main operating facility for drug and device development, regulatory, analytical technical services, research and development, and administration. We also maintain offices in Taipei, Taiwan, the former headquarters of CVie Therapeutics, where we perform certain manufacturing development and preclinical activities related to our cardiovascular drug product candidates.

Throughout the term of our leases, we are responsible for paying certain variable lease costs, in addition to the rent, as specified in the lease, including a proportionate share of applicable taxes, operating expenses and utilities.

The following table contains a summary of the lease costs recognized under ASC 842 and other information pertaining to our operating leases for the three and nine months ended September 30, 2019:

(in thousands)	Three Months Ended September 30, 2019	Nine Months Ended September 30, 2019
Operating lease cost	$ 212	$ 677
Variable lease cost	5	17
Total lease cost	$ 217	$ 694
Other Information		
Operating cash flows used for operating leases	$ 227	$ 721
Operating lease liabilities arising from obtaining right-of-use assets	$ 232	$ 364
Weighted average remaining lease term (in years)	2.4	2.4
Weighted average incremental borrowing rate	9.00%	9.00%

Future minimum lease payments under our non-cancelable operating leases as of September 30, 2019, are as follows:

(in thousands)	As of September 30, 2019
2019 (excluding the nine months ended September 30, 2019)	$ 230
2020	849
2021	638
2022	179
2023	23
Thereafter	-
Total lease payments	1,919
Less imputed interest	(184)
Total operating lease liabilities at September 30, 2019	1,735

Note 11 – Subsequent Event

Effective as of October 24, 2019, we entered into a Loan Agreement (“Loan Agreement”) with LPH II. Under the Loan Agreement, LPH II agreed to lend us $1.0 million (the “Loan”) to support our operations while we seek to complete a financing or Strategic Transaction (as defined in the Loan Agreement). The Loan, which was funded in a single installment on October 28, 2019, will accrue interest at a rate of 6% per annum and will mature upon the earlier of (i) the closing date for the Strategic Transaction on terms defined in the Loan Agreement, or (ii) December 31, 2019. If we are unable to complete the Strategic Transaction for any reason, based on our resources currently available to us, we likely will have insufficient resources to repay the Loan and may be forced to curtail some or all of our activities, and, ultimately, may be compelled to cease operations.

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13,221,430 Shares

Common Stock

Prospectus

, 2020

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution.

The following table sets forth the expenses payable by the Registrant expected to be incurred in connection with the issuance and distribution of Common Stock being registered hereby (other than underwriting discounts and commissions). All of such expenses are estimates, except for the Securities and Exchange Commission (SEC) registration fee.

SEC registration fee	$	6,641.47
Legal fees and expenses		50,000.00
Accounting fees and expenses		50,000.00
Total	$	106,641.47

Item 14. Indemnification of Directors and Officers.

Article Eight of our Amended and Restated Certificate of Incorporation, as amended, or Certificate of Incorporation, limits the liability of directors to the maximum extent permitted by Delaware law. Delaware law provides that directors of a corporation will not be personally liable for monetary damages for breach of their fiduciary duties as directors, except for liability for (i) any breach of their duty of loyalty to the corporation or its stockholders, (ii) acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law, (iii) unlawful payments of dividends or unlawful stock repurchases or redemptions as provided in Section 174 of the General Corporation Law of the State of Delaware or (iv) any transaction from which the director derives an improper personal benefit.

Our Amended and Restated By-Laws, or By-Laws, provide that we shall indemnify our directors and officers, the directors and officers of any of our subsidiaries and any other individuals acting as directors or officers of any other corporation at our request, to the fullest extent permitted by law.

We have entered into indemnification agreements with our executive officers and directors containing provisions that may require us, among other things, to indemnify them against liabilities that may arise by reason of their status or service as officers or directors, as applicable, other than liabilities arising from willful misconduct of a culpable nature and to advance certain expenses incurred as a result of any proceeding against them as to which they could be indemnified. We have obtained limited directors' and officers' liability insurance.

These provisions in our Certificate of Incorporation and our By-Laws do not eliminate the officers' and directors' fiduciary duty, and in appropriate circumstances, equitable remedies such as injunctive or other forms of non-monetary relief will remain available under Delaware law. In addition, each officer and director will continue to be subject to liability for breach of their duty of loyalty to us for acts or omissions not in good faith or involving intentional misconduct, for knowing violations of law, for actions leading to improper personal benefit to the officer or director and for payment of dividends or approval of stock repurchases or redemptions that are unlawful under Delaware law. The provisions also do not affect an officer's or director's responsibilities under any other law, such as the federal securities laws or state or federal environmental laws.

Item 15. Recent Sales of Unregistered Securities.

Set forth below is information regarding shares of our common stock and shares of our preferred stock issued, warrants issued, and stock options granted, by us within the past three years which were not registered under the Securities Act. All of the sales listed below were made pursuant to an exemption from registration afforded by Section 4(a)(2) of the Securities Act and Regulation D thereunder, as the securities were issued to accredited investors, without a view to distribution, and were not issued through any general solicitation or advertisement.

December 2019 Securities Purchase Agreement

On December 6, 2019, we entered into a Securities Purchase Agreement, or the SPA, and a Registration Rights Agreement, or the Registration Rights Agreement, with select institutional investors, or Investors, whereby we agreed to issued and sell to the Investors an aggregate of 8,749,999 shares of common stock at a price per share of $3.02, for an aggregate cash purchase price of approximately $26,424,997 million, or the Financing. In connection with the Financing, we issued Series I Warrants to the Investors to purchase up to an aggregate of 4,375,002 shares of common stock, or the Series I Warrant Shares, at an exercise price equal to $4.03 per share. The Series I Warrants may be exercised on the six-month anniversary of the date of issuance and through the 5-year anniversary of the date of issuance. The Series I Warrants may be exercised for cash or on a cashless basis if there is no effective registration statement registering the resale of the Series I Warrant Shares and may not be exercised to the extent that the holder thereof would, following such exercise or conversion, beneficially own more than 4.99% (or such other percent as designated by each holder not to exceed 19.99%) of our outstanding shares of common stock. The Series I Warrants contain customary provisions that adjust the exercise price and the number of Warrant Shares in the event of a corporate transaction.

Pursuant to the Registration Rights Agreement, we agreed to file by the earlier of four trading days following the filing of our annual report on Form 10-K with the U.S. Securities and Exchange Commission, or the SEC, or April 10, 2020, a resale registration statement with the SEC to register for subsequent resale the shares of common stock issued in the Financing and the Warrant Shares.

December 2018 Private Placement Financing

On December 21, 2018, we completed a private placement offering and entered into a Registration Rights Agreement, or December 2018 Registration Rights Agreement, with select institutional investors for the purchase of an aggregate of 11,785,540 shares of common stock at a price per share of $3.3132, for an aggregate purchase price of approximately $39.0 million, or the 2018 Private Placement Financing. Included in the purchase price, each of LPH II Investments Limited, or LPH II, an affiliate of Lee's Pharmaceuticals Holdings Limited, or Lee's, and Battelle Memorial Institute, or Battelle, converted $6.0 million and $1.0 million, respectively, of existing debt obligations on the same terms as the other select institutional investors. In connection with this offering, we issued (i) Series F Warrants to purchase an aggregate of 2,003,541 shares of common stock at an exercise price equal to $3.68 per share, which are exercisable through the 18-month anniversary of the date of issuance, or the Series F Warrants, and (ii) Series G Warrants to purchase an aggregate of 3,889,229 shares of common stock at an exercise price equal to $4.05 per share, which are exercisable through the 5-year anniversary of the date of issuance, or the Series G Warrants and, together with the Series F Warrants, the December 2018 Warrants. The December 2018 Warrants (i) may not be exercised to the extent that following such exercise, the holder would beneficially own more than 9.99% (or other percent as designated by each holder) of our outstanding shares of common stock, and (ii) contain customary provisions that adjust the exercise price and the number of shares of common stock into which the December 2018 Warrants are exercisable in the event of a corporate transaction.

Under the December 2018 Registration Rights Agreement, we filed on April 30, 2019 a resale registration statement with the SEC to register for subsequent resale the shares of common stock issued in the 2018 Private Placement Financing and the shares of common stock to be issued upon exercise of the December 2018 Warrants.

April 2018 Private Placement

In April 2018, we completed a private placement with LPH II for the purchase of $2.6 million of our common stock and warrants to purchase our common stock at a purchase price per share of $4.80. In connection with this offering, we issued 541,667 shares of common stock and warrants to purchase 135,417 shares of common stock at an exercise price of $5.52 per share. The warrants are exercisable after 6 months and through the seventh anniversary of the issue date. In addition, we entered into a registration rights agreement with LPH II whereby we agreed to file an initial resale registration statement with the SEC to register for subsequent resale the shares of common stock sold in this private placement and the warrant shares. We are required to seek registration of 25% of the shares and warrant shares on such initial resale registration statement. From time to time, following the 180th day from March 30, 2018, LPH II or a majority of the holders of the shares and warrant shares may require us to file additional registration statement(s) to register the resale of the balance of the shares and warrant shares, subject to certain limitations.

LPH Share Purchase Agreement

In October 2017, we entered into a Share Purchase Agreement, or LPH SPA, with LPH Investments Limited, or LPH, a company incorporated in the Cayman Islands with limited liability and an affiliate of Lee's, for the purchase of approximately $10 million of our common stock at a price of $4.326 per share, which represented a 15% premium over the average of the daily volume-weighted average price per share, or the VWAP, over the 10-day trading period ending on and including the date of the related agreement, and resulted in the issuance of 2,311,604 shares of our common stock to LPH. Following the transaction, Lee's beneficially owned 73% of our issued and outstanding shares of common stock. The investment included a cancellation of $3.9 million in outstanding loans that we had borrowed from Lee's Pharmaceutical (HK) Ltd., or Lee's (HK), a Hong Kong company organized and existing under the laws of Hong Kong under a Loan Agreement dated August 14, 2017, between ourselves and Lee's (HK). Although the LPH SPA granted LPH the right to appoint up to two individuals to serve on our Board of Directors, and LPH was permitted to designate such individuals on or prior to the 30th day following the closing of the transactions contemplated by the LPH SPA, no such appointments were made. In addition, the LPH SPA also amended the executive employment agreement of each of our President and Chief Executive Officer (Craig Fraser), Senior Vice President and Chief Financial Officer (John A. Tattory) and Senior Vice President and Chief Medical Officer (Steven G. Simonson, M.D.), such that the executives agreed to waive the guaranteed Annual Bonuses (as defined in each executive's employment agreement) that otherwise would have been payable to the executives during the 24-month period following the change of control to Lee's. Also under the LPH SPA, each executive was awarded restricted stock units under our 2011 Long-Term Incentive Plan, as amended, having a value when issued equal to the combined total value of the 2017 and 2018 Target Bonus Amounts (as defined in each executive's employment agreement) and initially vesting in two equal installments on March 15, 2018 and March 15, 2019. Under the terms of the LPH SPA, we also granted to LPH a preemptive right to purchase in future offerings of equity securities up to that number of shares of our equity securities needed to maintain LPH's percentage of beneficial ownership of our outstanding voting stock immediately prior to each such offering, subject to certain limitations and exclusions.

Contemporaneously with the execution of the LPH SPA, we and LPH entered into a registration rights agreement pursuant to which we agreed to provide certain registration rights with respect to the common stock issued under the LPH SPA, which rights are limited to registration of up to 25% of the shares of our common stock issued under the LPH SPA during the initial 18-month period following the closing of the LPH SPA. We sold and issued common stock to LPH pursuant to Rule 506(b) of Regulation D and Regulation S under, and Section 4(a)(2) of, the Securities Act of 1933, as amended.

February 2017 Securities Purchase Agreement

On February 15, 2017, we completed a private placement offering of 7,049 Series A Convertible Preferred Stock units at a price per unit of $1,495, for an aggregate purchase price of approximately $10.5 million, including $1.6 million of non-cash consideration representing a reduction in amounts due and accrued as of December 31, 2016 for current development services that otherwise would have become payable in cash in the first and second quarters of 2017. Each unit consists of (i) one share of Series A Convertible Preferred Stock, par value $0.001 per share, or the Preferred Shares; and (ii) 50 Series A-1 Warrants, or the A-1 Warrants, to purchase one share of common stock, par value $0.001 per share, at an exercise price equal to $27.40. The A-1 Warrants may be exercised beginning August 15, 2017 and through February 15, 2024. The Preferred Shares and the A-1 Warrants may not be converted or exercised to the extent that the holder would, following such exercise or conversion, beneficially own more than 9.99% (or other lesser percent as designated by each holder) of our outstanding shares of common stock. In the event of a liquidation, including without limitation, the sale of substantially all of our assets and certain mergers and other corporate transactions (as defined in the Certificate of Designation of Preferences, Rights and Limitations relating to the Preferred Shares), the holder of Preferred Shares had a liquidation preference that could result in the holder receiving a return of its initial investment before any payments were made to holders of common stock, and then participating with other equity holders until it had received in the aggregate up to three times its original investment. All outstanding Preferred Shares were converted in accordance with their terms in advance of the merger with CVie Investments Limited in December 2018.

Collaboration Agreement with Battelle

We entered into a Collaboration Agreement with Battelle in October 2014, which was amended on August 2015 and March 2016, for the development of a NextGen of our aerosol delivery system.

In December 2018, we and Battelle entered into the Battelle Payment Restructuring, which reflected the terms of an October 2017 nonbinding memorandum of understanding, in which we outlined terms to restructure approximately $4.3 million then due to Battelle, under a Research and Development Services Agreement dated as of June 22, 2012 and the Collaboration Agreement. In connection with the Battelle Payment Restructuring, on December 11, 2018, we issued to Battelle warrants to purchase 75,000 shares of common stock, exercisable at a price of $6.50 per share, which expire on the fifth anniversary of the Effective Date.

AEROSURF Warrants

In connection with the CVie Acquisition, our Board of Directors declared a dividend to the holders of record of our outstanding shares of common stock, and holders of certain warrants to purchase common stock, that were outstanding on December 20, 2018 of 0.6148 Series H (AEROSURF) Warrant, for each share of common stock held by a shareholder or each warrant held by a warrant holder, as applicable, on the record date, or the AEROSURF Warrants. The Company expects to distribute AEROSURF Warrants that are exercisable for an aggregate of 2,963,167 shares of common stock. Each AEROSURF Warrant has a term of five years and provides for automatic exercise into one share of common stock, without any exercise price, upon the Company's public announcement of the dosing of the first human subject enrolled in the Company's phase 3 clinical trial for AEROSURF.

Deerfield

In October 2017, we entered into an Exchange and Termination Agreement, or the Exchange and Termination Agreement, with affiliates of Deerfield Management Company, L.P., or Deerfield. Under the Exchange and Termination Agreement, (i) promissory notes evidencing an aggregate principal amount of $25,000,000 owed to Deerfield under that certain Facility Agreement dated as of February 13, 2013, or the Facility Agreement, as amended from time to time, and (ii) warrants to purchase up to 25,000 shares of the Company's common stock at an exercise price of $786.80 per share held by Deerfield, or the Deerfield Warrants, were cancelled in consideration for (i) a cash payment in the aggregate amount of $2,500,000, (ii) an aggregate of 71,111 shares of common stock and (iii) the right to receive certain milestone payments, or Milestone Payments, based on achievement of specified development and commercial milestones related to the Company's AEROSURF® development program, which, if achieved, could potentially total up to $15,000,000.

Item 16. Exhibits and Financial Statement Schedules.

Exhibit Number	Exhibit Title
3.1	Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to Windtree's Annual Report on Form 10-K, as filed with the SEC on April 17, 2018).
3.2	Amended and Restated By-Laws (incorporated by reference to Exhibit 3.2 to Windtree's Form 8-K filed on April 18, 2016).
4.1	Form of Warrant dated October 10, 2014 (incorporated by reference to Exhibit 4.11 to Windtree's Quarterly Report on Form 10-Q, as filed with the SEC on November 7, 2014).
4.2	Form of Series A Warrant dated July 22, 2015 (incorporated by reference to Exhibit 4.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on July 17, 2015).
4.3	Form of Series B Warrant dated July 22, 2015 (incorporated by reference to Exhibit 4.3 to Windtree's Current Report on Form 8-K, as filed with the SEC on July 17, 2015).
4.4	Form of Series A-1 Warrant dated February 13, 2017 (incorporated by reference to Exhibit 4.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on February 15, 2017).
4.5	Form of Series C Warrant dated April 4, 2018 (incorporated by reference to Exhibit 4.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on April 4, 2018).
4.6	Form of Series D Warrant dated July 2, 2018 (incorporated by reference to Exhibit 4.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on July 6, 2018).
4.7	Form of Series E Warrant dated December 11, 2018 (incorporated by reference to Exhibit 4.7 to Windtree's Annual Report on Form 10-K, as filed with the SEC on April 16, 2019).
4.8	Form of Series F Warrant dated December 24, 2018 (incorporated by reference to Exhibit 4.2 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 21, 2018).
4.9	Form of Series G Warrant dated December 24, 2018 (incorporated by reference to Exhibit 4.3 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 21, 2018).
4.10	Form of Series H Warrant dated February 14, 2019 (incorporated by reference to Exhibit 4.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 21, 2018).
4.11	Form of Series I Warrant dated December 6, 2019 (incorporated by reference to Exhibit 4.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 9, 2019).
5.1*	Opinion of Pepper Hamilton LLP.
10.1	Sublicense Agreement dated October 28, 1996 between Johnson & Johnson, Ortho Pharmaceutical Corporation and Acute Therapeutics, Inc. (incorporated by reference to Exhibit 10.6 to Windtree's Registration Statement on Form SB-2/A, as filed with the SEC on April 18, 1997 (Commission File Number 333-19375)).
10.2	Amended and Restated License Agreement dated March 28, 2008, between Windtree and Philip Morris USA Inc. (incorporated by reference to Exhibit 10.4 to Windtree's Quarterly Report on Form 10-Q for the quarter ended March 31, 2008, as filed with the SEC on May 9, 2008).
10.3	License Agreement dated March 28, 2008, between Windtree and Philip Morris Products S.A. (incorporated by reference to Exhibit 10.5 to Windtree's Quarterly Report on Form 10-Q for the quarter ended March 31, 2008, as filed with the SEC on May 9, 2008).

10.4	Amended and Restated Sublicense and Collaboration Agreement dated December 3, 2004, between Windtree and Laboratorios del Dr. Esteve, S.A. (incorporated by reference to Exhibit 10.28 to Windtree's Annual Report on Form 10-K for the year ended December 31, 2004, as filed with the SEC on March 16, 2005).
10.5	Amended and Restated Supply Agreement dated December 3, 2004, between Windtree and Laboratorios del Dr. Esteve, S.A. (incorporated by reference to Exhibit 10.29 to Windtree's Annual Report on Form 10-K for the year ended December 31, 2004, as filed with the SEC on March 16, 2005).
10.6	License, Development and Commercialization Agreement dated June 12, 2017, between Windtree and Lee's Pharmaceutical (HK) Ltd. (incorporated by reference to Exhibit 10.1 to Windtree's Quarterly Report on Form 10-Q for the quarter ended June 30, 2017, as filed with the SEC on August 21, 2017).
10.7	Amendment No. 1 dated August 14, 2017 to the License Development and Commercialization Agreement between Windtree and Lee's Pharmaceutical (HK) Ltd. dated June 12, 2017 (incorporated by reference to Exhibit 10.1 to Windtree's Quarterly Report on Form 10-Q for the quarter ended September 30, 2017, as filed with the SEC on November 14, 2017).
10.8	Windtree's 2011 Long-Term Incentive Plan, as amended (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 31, 2018).
10.9	Form of Employee Option Agreement under Windtree's 2011 Long-Term Incentive Plan (incorporated by reference to Exhibit 10.2 to Windtree's Quarterly Report on Form 10-Q for the quarter ended March 31, 2012, as filed with the SEC on May 15, 2012).
10.10	Form of Non-Employee Director Option Agreement under Windtree's 2011 Long-Term Incentive Plan (incorporated by reference to Exhibit 10.3 to Windtree's Quarterly Report on Form 10-Q for the quarter ended March 31, 2012, as filed with the SEC on May 15, 2012).
10.11	Form of Restricted Stock Unit Award Agreement for Non-Employee Directors under Windtree's 2011 Long-Term Incentive Plan (incorporated by reference to Exhibit 10.11 to Windtree's Annual Report on Form 10-K for the year ended December 31, 2014, as filed with the SEC on March 16, 2015).
10.12	Form of Restricted Stock Unit Award Agreement for Employees under Windtree's 2011 Long-Term Incentive Plan (incorporated by reference to Exhibit 10.14 to Windtree's Annual Report on Form 10-K for the year ended December 31, 2017, as filed with the SEC on April 17, 2018).
10.13	Employment Agreement dated February 1, 2016, between Windtree and Craig Fraser (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on February 3, 2016).
10.14	Inducement Stock Option Award Agreement dated February 1, 2016, between Windtree and Craig Fraser (incorporated by reference to Exhibit 10.3 to Windtree's Current Report on Form 8-K, as filed with the SEC on February 3, 2016).
10.15	Amendment dated March 13, 2018, to Employment Agreement dated February 1, 2016, between Windtree and Craig Fraser (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on March 16, 2018).
10.16	Employment Agreement dated December 19, 2014, between Windtree and Steven G. Simonson, M.D. (incorporated by reference to Exhibit 10.4 to Windtree's Quarterly Report on Form 10-Q, as filed with the SEC on May 11, 2015).

10.17	Amendment dated December 29, 2014 to Employment Agreement dated December 19, 2014, effective as of April 1, 2015, between Windtree and Steven G. Simonson, M.D. (incorporated by reference to Exhibit 10.5 to Windtree's Quarterly Report on Form 10-Q, as filed with the SEC on May 11, 2015).
10.18	Amendment dated March 13, 2018, to Employment Agreement dated December 19, 2014 between Windtree and Steven G. Simonson, M.D. (incorporated by reference to Exhibit 10.3 to Windtree's Current Report on Form 8-K, as filed with the SEC on March 16, 2018).
10.19	Employment Agreement dated March 21, 2014, between Windtree and John A. Tattory (incorporated by reference to Exhibit 10.1 to Windtree's Quarterly Report on Form 10-Q, as filed with the SEC on May 12, 2014).
10.20	Amendment dated December 29, 2014 to Employment Agreement dated March 21, 2014, effective as of April 1, 2015, between Windtree and John A. Tattory (incorporated by reference to Exhibit 10.19 to Windtree's Annual Report on Form 10-K for the year ended December 31, 2014, as filed with the SEC on March 16, 2015).
10.21	Amendment dated March 13, 2018 to Employment Agreement dated March 21, 2014 between John A. Tattory (incorporated by reference to Exhibit 10.2 to Windtree's Current Report on Form 8-K, as filed with the SEC on March 16, 2018).
10.22	Form of Indemnification Agreement between Windtree and certain named executive officers and directors (incorporated by reference to Exhibit 10.4 to Windtree's Current Report on Form 8-K, as filed with the SEC on February 3, 2016).
10.23	Form of Indemnification Agreement between Windtree and certain named directors (incorporated by reference to Exhibit 10.23 to Windtree's Annual Report on Form 10-K, as filed with the SEC on April 16, 2019).
10.24	Lease Agreement dated May 26, 2004, and First Amendment to Lease Agreement, dated April 2, 2007, between TR Stone Manor Corp. and Windtree (incorporated by reference to Exhibits 10.1 and 10.2 to Windtree's Current Report on Form 8-K, as filed with the SEC on April 6, 2007).
10.25	Second Amendment to Lease Agreement dated January 3, 2013 between TR Stone Manor Corp. and Windtree (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on January 8, 2013).
10.26	Fourth Amendment to Lease Agreement dated April 29, 2016, between PH Stone Manor LP and Windtree (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on May 31, 2016).
10.27	Fifth Amendment to Lease Agreement dated February 23, 2018, between PH Stone Manor LP and Windtree (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on March 1, 2018).
10.28	Master Services Agreement dated October 24, 2013 between Windtree and DSM Pharmaceuticals, Inc. (now known as Patheon Manufacturing Services LLC) (incorporated by reference to Exhibit 10.3 to Windtree's Quarterly Report on Form 10-Q, as filed with the SEC on November 12, 2013).
10.29	Supply Agreement dated December 22, 2010 between Corden Pharma (formerly Genzyme Pharmaceuticals LLC, now known as Corden Pharma) and Windtree (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 29, 2010).

10.30	Exchange and Termination Agreement dated October 27, 2017, between Windtree and Deerfield (incorporated by reference to Exhibit 10.2 to Windtree's Current Report on Form 8-K, as filed with the SEC on November 1, 2017).
10.31	Registration Rights Agreement dated October 27, 2017, between Windtree and LPH Investments Limited (incorporated by reference to Exhibit 99.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on November 1, 2017).
10.32	Registration Rights Agreement dated March 30, 2018, between Windtree and LPH II Investments Limited (incorporated by reference to Exhibit 10.2 to Windtree's Current Report on Form 8-K, as filed with the SEC on April 4, 2018).
10.33	Payment Restructuring Agreement effective December 7, 2018, between Windtree and Battelle Memorial Institute (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 7, 2018).
10.34	Loan Agreement dated October 25, 2018, between CVie Therapeutics, Lee's Pharmaceutical Holdings Limited, and O-Bank Co., Ltd. (incorporated by reference to Exhibit 10.34 to Windtree's Annual Report on Form 10-K, as filed with the SEC on April 16, 2019).
10.35	Shareholder Loan Agreement dated April 24, 2018, between Lee's Pharmaceutical International Limited and CVie Therapeutics (incorporated by reference to Exhibit 10.35 to Windtree's Annual Report on Form 10-K, as filed with the SEC on April 16, 2019).
10.36	Shareholder Loan Agreement dated September 20, 2018, between Lee's Pharmaceutical International Limited and CVie Therapeutics (incorporated by reference to Exhibit 10.36 to Windtree's Annual Report on Form 10-K, as filed with the SEC on April 16, 2019).
10.37	Shareholder Loan Agreement dated October 26, 2018, between Lee's Pharmaceutical International Limited and CVie Therapeutics (incorporated by reference to Exhibit 10.37 to Windtree's Annual Report on Form 10-K, as filed with the SEC on April 16, 2019).
10.38	Shareholder Loan Agreement dated November 16, 2018, between Lee's Pharmaceutical International Limited and CVie Therapeutics (incorporated by reference to Exhibit 10.38 to Windtree's Annual Report on Form 10-K, as filed with the SEC on April 16, 2019).
10.39	Merger Agreement dated December 21, 2018, between Windtree, WT Acquisition Corp., and CVie Investments Limited (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 21, 2018).
10.40	Indemnification Letter Agreement dated December 21, 2018, between Windtree and Lee's Pharmaceutical Holdings Limited (incorporated by reference to Exhibit 10.2 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 21, 2018).
10.41	Securities Purchase Agreement dated December 21, 2018 between Windtree and certain purchasers party thereto (incorporated by reference to Exhibit 10.3 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 21, 2018).
10.42	Registration Rights Agreement dated December 21, 2018 between Windtree and certain purchasers party thereto (incorporated by reference to Exhibit 10.4 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 21, 2018).
10.43	Loan Agreement dated October 24, 2019 between Windtree and LPH II Investments Ltd. (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on October 28, 2019).

10.44	Form of Securities Purchase Agreement dated December 6, 2019 by and among Windtree and the purchasers party thereto (incorporated by reference to Exhibit 10.1 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 9, 2019).
10.45	Form of Registration Rights Agreement dated December 6, 2019 by and among Windtree and the purchasers party thereto (incorporated by reference to Exhibit 10.2 to Windtree's Current Report on Form 8-K, as filed with the SEC on December 9, 2019).
21.1	Subsidiaries of Windtree (incorporated by reference to Exhibit 21.1 to Windtree's Annual Report on Form 10-K, as filed with the SEC on April 16, 2019).
23.1*	Consent of Ernst & Young LLP, independent registered public accounting firm.
24.1	Power of Attorney (contained in the signature page of this registration statement).
101.INS	Instance Document.
101.SCH	XBRL Taxonomy Extension Schema Document.
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.

* Filed herewith.
+ Compensation Related Contract.
† Confidential treatment received for certain portions of this exhibit.

Item 17. Undertakings.

(a) The undersigned Registrant hereby undertakes:

(1) to file, during any period in which offers or sales are being made, a post-effective amendment to this Registration Statement:

(i) to include any prospectus required by Section 10(a)(3) of the Securities Act;

(ii) to reflect in the prospectus any facts or events arising after the effective date of the Registration Statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the Registration Statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20% change in the maximum aggregate offering price set forth in the Calculation of Registration Fee" table in the effective Registration Statement; and

(iii) to include any material information with respect to the plan of distribution not previously disclosed in the Registration Statement or any material change to such information in the Registration Statement;

(2) that, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) to remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(5) that, for the purpose of determining liability under the Securities Act to any purchaser: each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness; provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Registrant pursuant to the foregoing provisions, or otherwise, the Registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized on January 21, 2020.

Windtree Therapeutics, Inc.

By: /s/ Craig E. Fraser
Name: Craig E. Fraser
Title: President and Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that the undersigned officers and directors of Windtree Therapeutics, Inc., a Delaware corporation, do hereby constitute and appoint each of Craig Fraser and John Tattory as his or her true and lawful attorney-in-fact and agent, with full power of substitution and re-substitution, for him and in his name, place, and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments, exhibits thereto and other documents in connection therewith) to this Registration Statement and any subsequent registration statement filed by the registrant pursuant to Rule 462(b) of the Securities Act of 1933, as amended, which relates to this Registration Statement, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agent, or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this registration statement has been signed below by the following persons in the capacities and on the dates indicated.

Signature	Name & Title	Date
/s/ Craig E. Fraser Craig E. Fraser	Director, President, and Chief Executive Officer (Principal Executive Officer)	January 21, 2020
/s/ John A. Tattory John A. Tattory	Senior Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)	January 21, 2020
/s/ James Huang James Huang	Director (Chairman of the Board)	January 21, 2020
/s/ Daniel E. Geffken Daniel Geffken	Director	January 21, 2020
/s/ John R. Leone John R. Leone	Director	January 21, 2020
/s/ Joseph M. Mahady Joseph M. Mahady	Director	January 21, 2020
/s/ Bruce A. Peacock Bruce A. Peacock	Director	January 21, 2020
/s/ Brian D. Schreiber Brian D. Schreiber, M.D.	Director	January 21, 2020

Exhibit 5.1

Pepper Hamilton LLP
Attorneys at Law

3000 Two Logan Square
Eighteenth and Arch Streets
Philadelphia, PA 19103-2799
215.981.4000
Fax 215.981.4750

January 21, 2020

Windtree Therapeutics, Inc.
2600 Kelly Road, Suite 100
Warrington, PA 18976

Re: Securities Registered under Registration Statement on Form S-1

Ladies and Gentlemen:

We have acted as counsel to Windtree Therapeutics, Inc., a Delaware corporation (the "***Company***"), in connection with the resale from time to time by the selling stockholders named in the Registration Statement on Form S-1 under the Securities Act of 1933, as amended (the "***Act***"), filed with the Securities and Exchange Commission (the "***Commission***") on January 21, 2020 (the "***Registration Statement***") of up to (i) 8,846,428 shares (the "***Common Shares***") of the Company's common stock, $0.001 par value per share (the "***Common Stock***") and (ii) up to 4,375,000 shares of Common Stock underlying the Series I Warrants dated December 6, 2019 (the "***Series I Warrants***") (the "***Warrant Shares***" and together with the Common Shares, the "***Shares***"). This opinion is being furnished in connection with the requirements of Item 601(b)(5) of Regulation S-K under the Act, and no opinion is expressed herein as to any matter pertaining to the contents of the Registration Statement or related Prospectus, other than as expressly stated herein with respect to the resale of the Shares.

As such counsel, we have examined such matters of fact and questions of law as we have considered appropriate for purposes of this letter. With your consent, we have relied upon certificates and other assurances of officers of the Company and others as to factual matters without having independently verified such factual matters. In our examination of the aforesaid documents, we have assumed the genuineness of all signatures, the legal capacity of all natural persons, the accuracy and completeness of all documents submitted to us, the authenticity of all original documents, and the conformity to authentic original documents of all documents submitted to us as copies (including pdfs). We are opining herein as to General Corporation Law of the State of Delaware, and we express no opinion with respect to any other laws.

Subject to the foregoing and the other matters set forth herein, it is our opinion that, as of the date hereof, the Shares have been duly authorized by all necessary corporate action of the Company, the Common Shares are validly issued, fully paid and nonassessable and the Warrant Shares, when issued and paid for in accordance with the terms of the Series I Warrants, will be validly issued, fully paid and nonassessable.

This opinion is for your benefit in connection with the Registration Statement and may be relied upon by you and by persons entitled to rely upon it pursuant to the applicable provisions of the Act. We consent to your filing this opinion as an exhibit to the Registration Statement and to the reference to our firm in the related Prospectus under the heading “Legal Matters.” In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ Pepper Hamilton LLP

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the reference to our firm under the caption "Experts" and to the use of our report dated April 16, 2019, in the Registration Statement (Form S-1) and related Prospectus of Windtree Therapeutics, Inc. and subsidiaries for the registration of 13,221,430 shares of its common stock.

/s/ Ernst & Young LLP

Philadelphia, Pennsylvania

January 20, 2020