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SUBMITTED CONFIDENTIALLY TO THE SECURITIES AND EXCHANGE COMMISSION ON NOVEMBER 21, 2014 AS AMENDMENT NO. 2 TO THE CONFIDENTIAL SUBMISSION FILE NO. 377-00621

As filed with the Securities and Exchange Commission on , 2014

Registration No. 333-

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

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

**BELLEROPHON THERAPEUTICS LLC**

(to be converted into Bellerophon Therapeutics, Inc.)  
(Exact name of registrant as specified in its charter)

<b>Delaware</b> (State or other jurisdiction of incorporation or organization)	<b>2834</b> (Primary Standard Industrial Classification Code Number)	<b>36-4771642</b> (I.R.S. Employer Identification No.)
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**53 Frontage Road, Suite 301  
Hampton, New Jersey 08827  
(908) 574-4770**

(Address, including zip code, and telephone number, including  
area code, of registrant's principal executive offices)

**Jonathan M. Peacock  
Chief Executive Officer  
Bellerophon Therapeutics LLC  
53 Frontage Road, Suite 301  
Hampton, New Jersey 08827  
(908) 574-4770**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

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**Approximate date of commencement of proposed sale to the public:  
As soon as practicable 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, 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, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer <input type="checkbox"/>	Accelerated filer <input type="checkbox"/>	Non-accelerated filer <input checked="" type="checkbox"/> (Do not check if a smaller reporting company)	Smaller reporting company <input type="checkbox"/>
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CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities To Be Registered	Proposed Maximum Aggregate Offering Price(1)	Amount of Registration Fee(2)
Common Stock, \$0.01 par value per share		

- (1) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(o) under the Securities Act of 1933, as amended.
- (2) Calculated pursuant to Rule 457(o) based on an estimate of the proposed maximum aggregate offering price.

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 or until the Registration Statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

## **EXPLANATORY NOTE**

Bellerophon Therapeutics LLC, the registrant whose name appears on the cover of this registration statement, is a Delaware limited liability company. Immediately prior to the effectiveness of this registration statement, Bellerophon Therapeutics LLC will be converted into a Delaware corporation, which we refer to as the Corporate Conversion, and renamed Bellerophon Therapeutics, Inc. Shares of the common stock, par value \$0.01 per share, of Bellerophon Therapeutics, Inc. are being offered by the prospectus that forms a part of this registration statement. For convenience, except as context otherwise requires, all information included in the prospectus that forms a part of this registration statement is presented giving effect to the Corporate Conversion.

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The information in this prospectus is not complete and may be changed. We may not sell these securities 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 an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated , 2014

PRELIMINARY PROSPECTUS

Shares



Common Stock

We are offering shares of our common stock. This is our initial public offering and no public market currently exists for our shares. We anticipate that the initial public offering price of our common stock will be between \$ and \$ per share.

We have applied to list our common stock on the NASDAQ Global Market under the symbol "BLPH."

We are an emerging growth company as that term is used in the Jumpstart Our Business Startups Act of 2012, and as such, are subject to reduced public company disclosure standards. See "Prospectus Summary—Implications of Being an Emerging Growth Company."

**Investing in our common stock involves a high degree of risk. Before buying any shares, you should carefully read the discussion of material risks of investing in our common stock in "Risk Factors" beginning on page 13 of this prospectus.**

	Per Share	Total
Initial public offering price	\$	\$
Underwriting discount	\$	\$
Proceeds to us, before expenses	\$	\$

We have granted the underwriters an option to purchase up to additional shares of our common stock to cover over-allotments. The underwriters can exercise this option at any time within 30 days after the date of this prospectus.

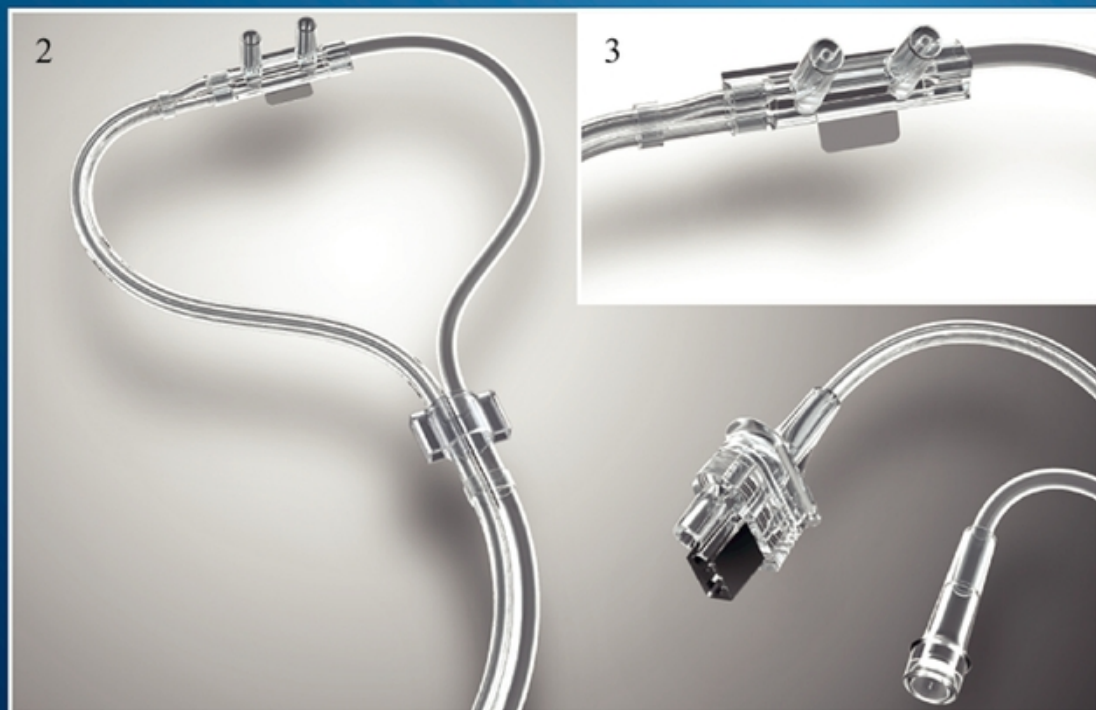
**Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed on the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.**

The underwriters expect to deliver the shares of common stock to investors on or about , 2014.

**Leerink Partners**

**Cowen and Company**

The date of this prospectus is , 2014.



Engineering CAD illustrations of our (1) INOpulse\* Mark2 device, (2) triple-lumen cannula and (3) nosepiece detail. These illustrations depict prototypes, which are currently under development and not commercially available.

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Neither we nor any of the underwriters have authorized anyone to provide you with information other than that contained in this prospectus or in any free writing prospectus prepared by or on behalf of us or to which we have referred you. We and the underwriters take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give to you. We are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or any sale of our common stock. Our business, financial condition, results of operations and prospects may have changed since that date.

No action is being taken in any jurisdiction outside the United States to permit a public offering of our common stock or possession or distribution of this prospectus in that jurisdiction. Persons who come into possession of this prospectus in jurisdictions outside the United States are required to inform themselves about and to observe any restrictions relating to this offering and the distribution of this prospectus applicable to that jurisdiction.

The trademarks, trade names and service marks appearing in this prospectus are the property of their respective owners.

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## PROSPECTUS SUMMARY

*This summary highlights information contained elsewhere in this prospectus. This summary does not contain all of the information you should consider before investing in our common stock. You should read this entire prospectus carefully, especially the "Risk Factors" section and our financial statements and the related notes appearing at the end of this prospectus, before making an investment decision.*





*This prospectus relates to an offering of our common stock following certain transactions described herein that will occur prior to the effectiveness of the registration statement of which this prospectus forms a part, which we refer to as the Corporate Conversion. As used in this prospectus, unless the context otherwise requires, references to the "Company," "Bellerophon," "we," "us" and "our" refer to (i) following the date of the Corporate Conversion discussed under the heading "Corporate Conversion," Bellerophon Therapeutics, Inc. and its consolidated subsidiaries, or any one or more of them as the context may require, and (ii) prior to the date of the Corporate Conversion, Bellerophon Therapeutics LLC and its consolidated subsidiaries, or any one or more of them as the context may require.*

### Company Overview

We are a clinical-stage therapeutics company focused on developing innovative products at the intersection of drugs and devices that address significant unmet medical needs in the treatment of cardiopulmonary and cardiac diseases. We have two programs in advanced clinical development. The first program, INOpulse, is based on our proprietary pulsatile nitric oxide delivery device. We are currently developing two product candidates under our INOpulse program: one for the treatment of pulmonary arterial hypertension, or PAH, for which we intend to commence Phase 3 clinical trials in the second half of 2015, and the other for the treatment of pulmonary hypertension associated with chronic obstructive pulmonary disease, or PH-COPD, which is in Phase 2 development. Our second program is bioabsorbable cardiac matrix, or BCM, which is currently in a placebo-controlled clinical trial designed to support CE mark registration in the European Union. Enrollment of this trial is almost complete with more than 290 out of 306 patients enrolled, as of November 15, 2014. Assuming positive results from this trial, we intend to conduct a pivotal pre-market approval trial of BCM beginning in the first half of 2016, which will be designed to support registration in the United States. We are developing BCM for the prevention of cardiac remodeling, which often leads to congestive heart failure following an ST-segment elevated myocardial infarction, or STEMI.

### Our Product Candidates

The following table summarizes key information about our development programs and product candidates. We have worldwide commercialization rights to all of our product candidates.

PROGRAMS	INDICATION		PHASE 1	PHASE 2	PHASE 3	UPCOMING MILESTONE
INOpulse	PAH					• Phase 3 clinical trial expected to start in second half of 2015
	PH-COPD					• Phase 2b clinical trial expected to start in second half of 2015
PROGRAMS	INDICATION	REGION	PILOT	FEASIBILITY	PIVOTAL	UPCOMING MILESTONE
BCM*	Prevention of Congestive Heart Failure	EU				• Trial results expected mid-2015
		US				

\* We are currently conducting a single clinical trial for BCM that, if positive, we plan to use as a CE mark registration trial in the European Union and following which we would conduct a second, larger clinical trial to support registration in the United States.

From the inception of our business through September 30, 2014, \$184.3 million was invested in our development programs. To date, our sole source of funding has been investments in us by our former parent company, Ikaria.

### ***INOpulse***

Our INOpulse program is an extension of the technology used in hospitals to deliver continuous-flow inhaled nitric oxide. Use of inhaled nitric oxide is approved by the U.S. Food and Drug Administration, or the FDA, and certain other regulatory authorities to treat persistent pulmonary hypertension of the newborn. Ikaria, Inc. or Ikaria, has marketed continuous-flow inhaled nitric oxide as INOmax for hospital use in this indication since approval in 1999. In October 2013, Ikaria transferred to us exclusive worldwide rights to develop and commercialize pulsed nitric oxide in PAH, PH-COPD and pulmonary hypertension associated with idiopathic pulmonary fibrosis, or PH-IPF, with no royalty obligations. Our INOpulse program is built on scientific and technical expertise developed for the therapeutic delivery of inhaled nitric oxide. In 2010, Ikaria filed an investigational new drug application, or IND, for INOpulse for the treatment of patients with PAH, which is a form of pulmonary hypertension that is closely related to persistent pulmonary hypertension of the newborn. In 2012, Ikaria filed a second IND for INOpulse for the treatment of patients with PH-COPD. These INDs were included in the assets that were transferred to us by Ikaria.

Nitric oxide is naturally produced and released by the lining of the blood vessel and results in vascular smooth muscle relaxation, an important factor in regulating blood pressure. As the muscles of the blood vessels relax, this allows the heart to increase blood flow to tissues and organs of the body, including the lung. When administered through inhalation, nitric oxide acts to selectively reduce pulmonary arterial pressure in the lung with minimal effects on blood pressure outside of the lungs, an important safety consideration.

Inhaled nitric oxide is widely used in the hospital setting for the treatment of a variety of conditions and, as reported by Ikaria, over 450,000 patients have been treated with inhaled nitric oxide worldwide since its first such use. However, chronic outpatient use of this therapy has previously been limited by a lack of a safe and compact delivery system for outpatient use. We have designed our INOpulse device, which is the means by which inhaled nitric oxide is delivered to the patient, to be portable, which enables use by ambulatory patients on a daily basis inside or outside their homes. Our INOpulse device has a proprietary mechanism that delivers brief, targeted pulses of nitric oxide timed to occur at the beginning of a breath for delivery to the well-ventilated alveoli of the lungs, which minimizes the amount of drug required for treatment. We estimate this, and the higher concentration of nitric oxide we use, reduces the volume of drug delivered to approximately 5% of the volume required for equivalent alveolar absorption using standard continuous flow delivery systems, and also reduces the amount of nitric oxide, as well as its by-product nitrogen dioxide, that is exhaled and released into the patient's environment. INOpulse is designed to automatically adjust nitric oxide delivery based on a patient's breathing pattern to deliver a constant and appropriate dose of the inhaled nitric oxide over time, independent of the patient's activity level, thus ensuring more consistent dosing of the nitric oxide to the alveoli of the lungs.

In our recently completed INOpulse clinical trials, we used the first generation INOpulse device, which we refer to as the INOpulse DS device. In future clinical trials, we intend to use our second generation device, which we refer to as the Mark2. The Mark2 has approximately the same dimensions as a paperback book and weighs approximately 2.5 pounds. The Mark2 has a simple and intuitive user interface and a battery life of approximately 24 hours when recharged, which takes approximately four hours and can be done while the patient sleeps. Based on the doses we have evaluated in our clinical trials, we expect that the cartridge will need to be replaced once a day. In addition, we have developed a triple-lumen nasal cannula, which forms part of the Mark2 and enables more accurate dosing of nitric oxide and minimizes infiltration of oxygen, which can react with nitric oxide to form nitrogen dioxide.



Our triple-lumen nasal cannula consists of a thin, plastic tube that is divided into three channels from end-to-end, including at the prongs that are placed in the patient nostrils, with one channel delivering inhaled nitric oxide, a second for breath detection and a third available for oxygen delivery. INOpulse is designed to be compatible with many long-term oxygen therapy systems. In the usability research we conducted, all eight patients with experience with the INOpulse DS device responded positively to the Mark2, and several of these patients indicated that the ability to take the Mark2 outside the home would likely reduce concerns with maintaining compliance.

Our technology is based on patents we have exclusively licensed from Ikaria for the treatment of PAH, PH-COPD and PH-IPF. These include patents with respect to the pulsed delivery of nitric oxide to ensure a consistent dose over time, which expire as late as 2027 in the United States and as late as 2026 in certain other countries, as well as with respect to the special triple-lumen cannula that allows for safer and more accurate dosing of pulsed nitric oxide, which expires in 2033. We have also licensed several other patent applications from Ikaria for certain of the innovations included in the Mark2 and certain of the resulting patents, if issued, would expire as late as 2033.

#### *INOpulse for PAH*

We are developing INOpulse for the treatment of PAH to address a significant and unmet medical need in an orphan disease, which is a disease that affects fewer than 200,000 individuals in the United States. This program represents a potential first-in-class therapy for this indication. In October 2014, we completed a randomized, placebo-controlled, double-blind Phase 2 clinical trial of INOpulse for PAH. The data from this trial showed trends toward lower pulmonary vascular resistance in both active arms compared to placebo and a slight trend toward increased six-minute walk distance in the higher dose group. While neither result reached the threshold for statistical significance, additional exploratory analyses of patients who were compliant with therapy, assessed as being on therapy for greater than 12 hours per day, as well as a similar analysis of patients on long-term oxygen therapy, or LTOT, showed clinically meaningful and statistically significant improvements in both the primary endpoint of pulmonary vascular resistance and the key secondary endpoint of six-minute walk distance, relative to placebo, for patients on the higher dose. These two sub groups each comprised more than 50% of the total patients enrolled in the trial.

We believe the results of this trial provide sufficient indication of efficacy and safety to continue development of INOpulse for PAH in pivotal Phase 3 clinical trials, the primary endpoints of which will be tied to functional capacity for patients with PAH. We have an End of Phase 2 meeting scheduled with the FDA in January 2015 to discuss this plan. We intend to finalize our plans for this product candidate, including for clinical trial design, following this meeting as well as following additional discussions with regulatory authorities, including the European Medicines Agency, or EMA. Currently, we intend to begin Phase 3 clinical trials in the second half of 2015.

The FDA has granted orphan drug designation to our nitric oxide program for the treatment of PAH. If a product with an orphan drug designation is the first to receive FDA approval, the FDA will not approve another product for the same indication that uses the same active ingredient for seven years, unless the other product is shown to be clinically superior.

PAH is characterized by abnormal constriction of the arteries in the lung that increases the blood pressure in the lungs which, in turn, results in abnormal strain on the heart's right ventricle, eventually leading to heart failure. While prevalence data varies widely, we estimate there are a total of at least 35,000 patients currently diagnosed with and treated for PAH in the United States and European Union. Moreover, because PAH is rare and causes varied symptoms, we believe there is significant under-diagnosis of the condition at its early stages. There are several approved therapies for PAH, and we estimate, based on public product sales data, that 2012 combined global sales for these therapies were over \$4.0 billion. Most PAH patients are treated with multiple medications and many are on

supportive therapy, including approximately 40% who are treated with LTOT. Despite the availability of multiple therapies for this condition, PAH continues to be a life-threatening, progressive disorder. A French registry initiated in 2002 and a U.S. registry initiated in 2006 estimate that the median survival of patients with PAH is three and five years from initial diagnosis, respectively.

#### *INOpulse for PH-COPD*

We are also developing INOpulse for the treatment of PH-COPD. The data from an initial three-month, open-label chronic-use Phase 2 trial conducted by a third party, which we in-licensed, showed that pulsed inhaled nitric oxide significantly reduced pulmonary arterial pressures in PH-COPD patients on LTOT and did so without causing hypoxemia, or an abnormally low level of oxygen in the blood, which is a significant concern for these patients. In June 2012, Ikaria submitted the data from this trial to the FDA as part of the IND package for INOpulse for PH-COPD. Based on discussions with the FDA, we believe this trial is an adequate Phase 2 trial. The FDA asked us to confirm the dose range and the safety related to hypoxemia in PH-COPD patients using the INOpulse device, prior to proceeding to large scale trials. Following this guidance, we conducted a Phase 2 acute dose ranging trial with the INOpulse DS device. This trial, which we completed in July 2014 identified a dose range that showed similar reduction in pulmonary arterial pressure versus baseline when compared to the initial acute effects of pulsed inhaled nitric oxide in the original chronic-use trial. In addition, in our confirmatory trial, none of the INOpulse doses tested had an adverse effect on hypoxemia relative to placebo. While the reduction in pulmonary arterial pressure did not reach statistical significance versus placebo in this acute setting, which was the primary endpoint of the trial, we believe that the results have confirmed a dose range for this therapy that delivers a significant reduction in pulmonary arterial pressure versus baseline and does not cause hypoxemia in patients with PH-COPD. We are currently evaluating our trial design for chronic use in this population in a Phase 2b trial and plan to finalize the protocol following discussions with regulatory authorities in the United States and European Union.

COPD is a disease characterized by progressive and persistent airflow limitations. Patients with more severe COPD frequently have hypoxemia and may be treated with LTOT. Despite treatment with oxygen, hypoxemia can progress and contribute to pulmonary hypertension. In 2010, Datamonitor estimated that over 1.4 million COPD patients in the United States were being treated with LTOT. Based on academic studies, we estimate that 50% of COPD patients on LTOT have pulmonary hypertension. PH-COPD patients have a lower median life expectancy and a higher rate of hospitalization than COPD patients with similar respiratory disease but without pulmonary hypertension. Currently, there are no approved therapies for treating PH-COPD, and the only generally accepted treatments are LTOT, pulmonary rehabilitation and lung transplant.

#### **BCM**

Our second program, BCM, is a medical device intended to prevent congestive heart failure following an ST-segment elevated myocardial infarction, or STEMI, which is a type of severe heart attack. Patients who suffer STEMI are at an increased risk for congestive heart failure due to potential cardiac remodeling, which is a structural change in the size and shape of the heart that affects its ability to function normally.

BCM is delivered during a minimally invasive, commonly performed cardiac procedure called a percutaneous coronary intervention procedure. BCM is a formulated sterile solution of sodium alginate and calcium gluconate designed to be administered as a liquid through the coronary artery. When administered following a STEMI, BCM flows into damaged heart muscle where, in the presence of abnormally high extracellular calcium released by the damaged cells, it forms a protective hydrogel meshwork within the wall of the heart's left ventricle. Based on pre-clinical animal studies, we believe that BCM has the potential to act as a flexible scaffold to provide physical support to the ventricle wall in the early stages of recovery following a STEMI and prevent further structural damage while the

heart muscle heals. In addition, in our pre-clinical animal studies, as calcium levels in the damaged area returned to normal, BCM dissolved and was excreted through normal kidney function.

In a 27-patient pilot clinical trial conducted in 2009, BCM was safely administered within seven days following a STEMI. Patients showed no deterioration from baseline of important measures of left ventricular function at one, three and six month measurements. Follow-up safety data for these patients, which was obtained four years after the completion of the pilot clinical trial, showed one death from T-cell lymphoma—likely a preexisting condition—and one hospitalization from congestive heart failure. One patient was lost to follow-up in year four, but this patient had no device related adverse events through the three-year evaluation. These results were below the incidence of adverse events of approximately 25% to 30% we expected for patients following an acute myocardial infarction, or AMI, commonly known as a heart attack. This expectation was based on our review of publicly reported data from two long-term third-party studies of AMI patients.

We initiated a clinical trial of BCM in December 2011 and enrolled the first patient in April 2012. Enrollment of this trial is almost complete with more than 290 out of 306 patients enrolled and with the device deployed at almost 90 clinical sites in Europe, Australia, North America and Israel, as of November 15, 2014. We expect to report top line results in mid-2015, following a six-month follow-up period for all patients. This trial is a CE mark registration trial in the European Union. If the results of this trial are positive, we expect it would form the basis for our application for CE marking in the European Union and we would expect to conduct a second, larger clinical trial to support approval in the United States through the premarket approval, or PMA, pathway.

In the United States, we are developing BCM under an investigational device exemption, or IDE. We sponsored an IDE application for our ongoing feasibility clinical trial of BCM to prevent ventricular remodeling and heart failure in patients who are at high risk for ventricular remodeling after an AMI and a successful percutaneous coronary intervention. The FDA has designated BCM as a Class III device. Class III devices are those which the FDA deems to pose the greatest risk, such as those that are life sustaining or life supporting. As a result, the FDA regulates Class III devices under the most rigorous device approval pathway, the PMA process. Device approval under the PMA pathway must be supported by extensive data, including from pre-clinical studies and clinical trials, that demonstrate the safety and efficacy of the device for its intended use. In August 2013, the FDA confirmed that no additional pre-clinical studies were required to support a PMA application. Assuming positive results from this trial, we intend to conduct a pivotal pre-market approval trial of BCM beginning in the first half of 2016, which will be designed to support registration in the United States.

We have an exclusive worldwide license to BCM from BioLineRx Ltd. and its subsidiary, or BioLine, including with respect to issued composition of matter patents on BCM that expire as late as 2029 in the United States, with a possible patent term extension to 2032 to 2034 depending on the timing of marketing approval and other factors, and 2024 in certain other countries. We licensed this product candidate in 2009, following completion of the 27-patient pilot clinical trial conducted by BioLineRx Ltd.

Data from the American Heart Association and the European Association for Percutaneous Cardiovascular Interventions suggests that a total of over 1,900,000 patients suffer a heart attack in the United States and European Union each year, with at least 750,000 of these patients having a STEMI. Following a STEMI, patients are at increased risk of developing cardiac remodeling and subsequent congestive heart failure, and data from long-term third-party studies suggest that the five-year post-AMI rate of congestive heart failure or death is approximately 35% to 40%.

## Our Strategy

Our goal is to become a leader in developing and commercializing innovative products at the intersection of drugs and devices that address significant unmet medical needs in the treatment of cardiopulmonary and cardiac diseases. The key elements of our strategy to achieve this goal include:

- *Advance the clinical development of INOpulse.* One of our lead product candidates is INOpulse for PAH. Based on the results from our recently completed Phase 2 clinical trial in PAH, we intend to initiate a Phase 3 clinical trial for this indication in the second half of 2015. In addition, we believe the results of the PH-COPD clinical trials support continued Phase 2 development and we plan to evaluate our options for further development including potentially through partnerships.
- *Advance the clinical development of BCM in the prevention of cardiac remodeling following a STEMI.* One of our other lead product candidates is BCM. Assuming positive results from our ongoing clinical trial, we expect to file for CE marking in the European Union in the second half of 2015 and to initiate a pivotal trial in early 2016 to support a PMA submission seeking marketing approval in the United States.
- *Leverage our historical core competencies to expand our pipeline.* We have years of institutional experience in the use of inhaled nitric oxide in treating pulmonary hypertension and in the development of drug-device combination product candidates. If we successfully advance INOpulse for the two product candidates we are currently developing, we expect to develop INOpulse for treatment of PH-IPF and, subject to obtaining additional license rights from Ikaria, potentially other outpatient pulmonary hypertension indications. Our longer-term vision is to identify and opportunistically in-license innovative therapies that are at the intersection of drugs and devices and to develop and commercialize these product candidates.
- *Build commercial infrastructure in select markets.* As we near completion of the development of our product candidates, we expect to build a commercial infrastructure to enable us to market and sell certain of our product candidates with a specialized sales force and to retain co-promotion or similar rights, when feasible, in indications requiring a larger commercial infrastructure. While we may partner with third parties to commercialize our product candidates in certain countries, we may also choose to establish commercialization capabilities in select countries outside the United States.

## The Spin-Out

In October 2013, Ikaria completed an internal reorganization of certain assets and subsidiaries, in which it transferred to us exclusive worldwide rights, with no royalty obligations, to develop and commercialize pulsed nitric oxide in PAH, PH-COPD and PH-IPF. Following the internal reorganization, in February 2014, Ikaria distributed all of our then outstanding units to its stockholders through the payment of a special dividend on a pro rata basis based on each stockholder's ownership of Ikaria capital stock. We refer to Ikaria's distribution of our then outstanding units to its stockholders as the Spin-Out. Shortly after the Spin-Out, Ikaria was acquired by entities affiliated with Madison Dearborn Partners, a private equity firm.

In connection with the Spin-Out, we entered into several agreements with Ikaria providing for, among other things, the provision of transition services, the cross license of certain intellectual property, commitments not to compete, the manufacture and supply of the INOpulse drug and device and certain employee matters.

As used in this prospectus, unless context otherwise requires, references to "Ikaria" refer to Ikaria, Inc. and its subsidiaries and any successor entity.

## Risk Factors

Our business is subject to a number of risks of which you should be aware before making an investment decision. As a clinical-stage biotherapeutics company, we may face inherent risks in our business and our industry generally. These risks are discussed more fully in the "Risk Factors" section of this prospectus immediately following this prospectus summary. These risks include, among others:

- We have incurred significant losses since inception. We expect to incur losses over the next several years and may never achieve or maintain profitability.
- Our very limited operating history as a stand-alone company may make it difficult for you to evaluate the success of our business to date and to assess our future viability. We currently rely on Ikaria for transition services and may be unable to make the changes necessary to operate as a stand-alone company.
- We will need substantial additional funding. Prior to the Spin-Out, we were funded by Ikaria. Going forward, if we are unable to raise capital when needed, we could be forced to delay, reduce or eliminate our product development programs or commercialization efforts.
- We are dependent on the success of our INOpulse and BCM product candidates and our ability to develop, obtain marketing approval for and successfully commercialize these product candidates. If we are unable to develop, obtain marketing approval for or successfully commercialize our product candidates, either alone or through a collaboration, or experience significant delays in doing so, our business could be materially harmed.
- We rely on Ikaria for our supply of nitric oxide for the clinical trials of INOpulse. Ikaria is the sole supplier of nitric oxide. Ikaria's inability to continue manufacturing adequate supplies of nitric oxide, or its refusal to supply us with commercial quantities of nitric oxide on commercially reasonable terms, or at all, could result in a disruption in the supply of, or impair our ability to market, INOpulse.
- Clinical trials involve a lengthy and expensive process with an uncertain outcome. We may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.
- We exclusively license BCM from BioLine and INOpulse from Ikaria, and we may enter into additional agreements to in-license technology from third parties. If we fail to comply with our obligations under any such license agreements, we could lose rights that are important to our business. BioLine has raised concerns with respect to our performance under the terms of our license agreement and with respect to certain alleged breaches by us under such agreement, including our alleged failure to use commercially reasonable efforts to develop our BCM product candidate, provide BioLine with material information concerning the development and commercialization plans for BCM and notify BioLine in advance of material public disclosures regarding BCM. BioLine could bring a legal action against us relating to these alleged breaches or seek to terminate the license agreement.
- We may seek to enter into collaborations with third parties for the development and commercialization of our product candidates. If we fail to enter into such collaborations, or such collaborations are not successful, we may not be able to capitalize on the market potential of our product candidates.
- If we are unable to obtain and maintain patent protection for our technology and products or if the scope of the patent protection obtained is not sufficiently broad, our competitors could

develop and commercialize technology and products similar or identical to ours, and our ability to successfully commercialize our technology and products may be impaired.

- Our principal stockholders will continue to have substantial control over us after this offering, which could limit your ability to influence the outcome of key transactions, including any change of control.

### **Corporate Information**

We were incorporated under the laws of the State of Delaware on October 17, 2013 under the name Ikaria Development LLC. We changed our name to Bellerophon Therapeutics LLC on January 27, 2014. We currently have three wholly-owned subsidiaries: Bellerophon BCM LLC, a Delaware limited liability company; Bellerophon Pulse Technologies LLC, a Delaware limited liability company; and Bellerophon Services, Inc., a Delaware corporation. Our website address [www.bellerophon.com](http://www.bellerophon.com). The information contained on, or that can be accessed through, our website does not constitute part of this prospectus. We have included our website address in this prospectus solely as an inactive textual reference.

Our executive offices are located at 53 Frontage Road, Suite 301, Hampton, New Jersey 08827, and our telephone number is (908) 574-4770.

### **Corporate Conversion**

We are currently a Delaware limited liability company. Prior to the effectiveness of the registration statement of which this prospectus forms a part, we will complete transactions pursuant to which we will convert into a Delaware corporation and change our name to Bellerophon Therapeutics, Inc. In connection with the conversion, all of our outstanding voting units and non-voting units will convert into shares of voting common stock and non-voting common stock, respectively, and options to purchase our non-voting units will become options to purchase non-voting shares of our common stock. Pursuant to their terms, upon the consummation of this offering, the non-voting common stock will be converted into voting common stock and options to purchase non-voting common stock will become options to purchase voting common stock. Also, in connection with our conversion into a Delaware corporation, certain entities affiliated with certain of our principal stockholders will be merged with and into us. See "Corporate Conversion."

### **Implications of Being an Emerging Growth Company**

We qualify as an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. As an emerging growth company we are permitted and intend to rely on exemptions from specified disclosure and other requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- being permitted to provide only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure;
- not being required to comply with the auditor attestation requirements in the assessment of our internal control over financial reporting;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements;
- reduced disclosure obligations regarding executive compensation; and

- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

We may take advantage of these exemptions for up to five years or such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company if we have more than \$1.0 billion in annual revenue, we have more than \$700.0 million in market value of our stock held by non-affiliates or we issue more than \$1.0 billion of non-convertible debt over a three-year period. We may choose to take advantage of some or all of the available exemptions. We have taken advantage of certain reduced reporting burdens in this prospectus. Accordingly, the information contained herein may be different than the information you receive from other public companies in which you hold stock.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This provision allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards, and therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

## THE OFFERING

Common stock offered	shares
Common stock to be outstanding after this offering	shares
Over-allotment option	The underwriters have an option for a period of 30 days from the date of this prospectus to purchase up to additional shares of our common stock to cover over-allotments.
Use of proceeds	<p>We estimate that the net proceeds from this offering, after deducting underwriting discounts and commissions and estimated offering expenses payable by us, will be approximately \$ million, or approximately \$ million if the underwriters exercise their option to purchase additional shares from us in full, assuming an initial public offering price of \$ , the midpoint of the estimated price range set forth on the cover page of this prospectus. We intend to use the net proceeds from this offering to fund to completion our ongoing clinical trial for BCM, to fund the first trial in our planned Phase 3 clinical program for INOpulse for PAH and for working capital and other general corporate purposes.</p> <p>See "Use of Proceeds" for more information.</p>
Risk factors	You should read the "Risk Factors" section beginning on page 13 of this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our common stock.
Proposed NASDAQ Global Market symbol	"BLPH"

The number of shares of our common stock to be outstanding after this offering is based on 98,919,412 voting and non-voting shares of our common stock outstanding as of September 30, 2014 and excludes:

- 13,754,598 shares of common stock issuable upon the exercise of stock options outstanding as of September 30, 2014 at a weighted average exercise price of \$0.80 per share;
- additional shares of our common stock that will be available for future issuance under our 2014 equity incentive plan; and
- additional shares of our common stock that will be available for future issuance, as of the closing of this offering, under our public company stock incentive plan.

Unless otherwise indicated, all information in this prospectus:

- assumes no exercise of the outstanding options described above;
- assumes no exercise of the underwriters' option to purchase additional shares;
- gives effect to the Corporate Conversion as described under "Corporate Conversion";
- assumes the conversion of all of the outstanding shares of our non-voting common stock into common stock upon the closing of this offering; and
- assumes the filing of our restated certificate of incorporation and the adoption of our amended and restated bylaws upon the closing of this offering.



## SUMMARY FINANCIAL INFORMATION

The following summary financial information as of and for the years ended December 31, 2013 and 2012 has been derived from our audited financial statements as of and for the years ended December 31, 2013 and 2012 included elsewhere in this prospectus. The following summary financial information as of September 30, 2014 and for the nine months ended September 30, 2014 and 2013 has been derived from our unaudited condensed consolidated financial statements included elsewhere in this prospectus. The summary financial information below should be read in conjunction with our historical financial statements and the related notes included elsewhere in this prospectus, as well as the "Selected Financial Information" and "Management's Discussion and Analysis of Financial Condition and Result of Operations" sections of this prospectus.

Our financial statements for periods prior to the Spin-Out, which occurred on February 12, 2014, include allocations of costs from certain shared functions provided to us by Ikaria, including general corporate and shared services expenses. These allocations were made based on either specific identification or the proportionate percentage of employee time or headcount to the respective total Ikaria employee time or headcount, as applicable, and have been included in our financial statements for periods prior to February 12, 2014.

The financial statements included in this prospectus may not necessarily reflect our financial position, results of operations and cash flows as if we had operated as a stand-alone company during all of the periods presented. Our historical results for any prior period are not necessarily indicative of results to be expected in any future period, and our interim period results are not necessarily indicative of results to be expected for a full fiscal year or any other interim period.

(in thousands, except per share data)	Nine Months Ended September 30,		Year Ended December 31,	
	2014	2013	2013	2012
	(unaudited)			
Statement of Operations and Comprehensive Loss Information				
Operating expenses:				
Research and development	\$ 36,368	\$ 39,068	\$ 52,985	\$ 38,727
General and administrative	10,537	6,155	9,013	7,185
Other operating expense	—	—	—	315
Net loss and comprehensive loss	<u>\$ (46,905)</u>	<u>\$ (45,223)</u>	<u>\$ (61,998)</u>	<u>\$ (46,227)</u>
Net loss per unit:				
Basic and diluted(1)	\$ (0.47)			

(in thousands)	As of September 30, 2014 (unaudited)	As of December 31,		As of September 30, 2014	
		2013	2012	Pro Forma(2)	Pro Forma As Adjusted(3)
<b>Balance Sheet Information</b>					
Cash and cash equivalents	\$ 30,605	—	—		
Restricted cash(4)	13,127	—	—		
Working capital (deficit)	27,906	(12,440)	(10,892)	—	—
Total assets	48,634	3,636	3,349		
Allocated portion of Ikaria special dividend bonus payable	—	4,273	2,865		
Other non-current liabilities	—	1,108	389		
Total long term liabilities	—	5,381	3,254		
Members' equity / invested (deficit)	35,100	(15,737)	(11,116)		—

- (1) The weighted average units outstanding for basic and diluted net loss per unit for the nine months ended September 30, 2014 is 98,930,615. No net loss per unit information is presented for periods prior to the Spin-Out.
- (2) The pro forma balance sheet information gives effect to the Corporate Conversion.

- (3) The pro forma as adjusted balance sheet information gives further effect to (i) our issuance and sale of \_\_\_\_\_ shares of common stock in this offering at an assumed initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, and (ii) the conversion of all of our outstanding shares of non-voting common stock into shares of voting common stock.
- (4) Represents cash deposited into escrow to pay amounts owed under the transition services agreement with Ikaria.

A \$1.00 increase (decrease) in the assumed initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working (deficit) capital, total assets and members' equity/invested (deficit) by \$ \_\_\_\_\_ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remain the same and after deducting estimated underwriting discounts and commissions. Each increase (decrease) of 1.0 million shares in the number of shares of common stock offered by us at the assumed initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working (deficit) capital, total assets and members' equity/invested (deficit) by \$ \_\_\_\_\_ million, after deducting estimated underwriting discounts and commissions.

## RISK FACTORS

*Investing in our common stock involves a high degree of risk. Before you decide to invest in our common stock, you should carefully consider the risks and uncertainties described below, together with the other information contained in this prospectus, including our financial statements and the related notes appearing at the end of this prospectus. If any of the following risks occur, our business, financial condition, results of operations and prospects could be materially and adversely affected. In these circumstances, the market price of our common stock could decline, and you might lose all or part of your investment.*

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

***We have incurred significant losses since inception. We expect to incur losses over the next several years and may never achieve or maintain profitability.***

Since inception, we have incurred significant operating losses. Our net loss was approximately \$46.2 million for the year ended December 31, 2012, \$62.0 million for the year ended December 31, 2013 and \$46.9 million for the nine months ended September 30, 2014. We do not know whether or when we will become profitable. We have not generated any revenues to date from product sales. We have not completed development of any product candidate and have devoted substantially all of our financial resources and efforts to research and development, including pre-clinical studies and clinical trials. We expect to continue to incur significant expenses and operating losses over the next several years. Our net losses may fluctuate significantly from quarter to quarter and year to year. Net losses and negative cash flows have had, and will continue to have, an adverse effect on our deficit and working capital. We anticipate that our expenses will increase substantially if and as we:

- continue our research and clinical development of our inhaled nitric oxide program using our proprietary pulsatile technology, which we refer to as our INOpulse program, for the treatment of pulmonary arterial hypertension, or PAH, and pulmonary hypertension associated with chronic obstructive pulmonary disease, or PH-COPD, and of our program in respect of bioabsorbable cardiac matrix, or BCM, for the prevention of left ventricular remodeling following an ST-segment elevated myocardial infarction, or STEMI;
- identify, develop and/or in-license additional product candidates;
- seek regulatory approvals for any product candidates that successfully complete clinical trials;
- in the future, establish a manufacturing, sales, marketing and distribution infrastructure;
- maintain, expand and protect our intellectual property portfolio;
- add equipment and physical infrastructure to support our research and development;
- hire additional clinical, regulatory, quality control and scientific personnel; and
- add operational, financial and management information systems and personnel, including personnel to support our product development, any future commercialization efforts and our transition to a public company.

To become and remain profitable, we must succeed in developing and eventually commercializing products that generate significant revenue. We do not expect to generate significant revenue unless and until we are able to obtain marketing approval for, and successfully commercialize, one or more of our product candidates. This will require us to be successful in a range of challenging activities, including completing pre-clinical studies and clinical trials of our product candidates, discovering additional product candidates, obtaining regulatory approval for our product candidates, manufacturing, marketing and selling any products for which we may obtain regulatory approval, satisfying any post-marketing requirements and obtaining reimbursement for our products from private insurance or government payors. We are in the early stages of most of these activities and have not yet commenced other of

these activities. We may never succeed in these activities and, even if we do, may never generate revenues that are significant enough to achieve profitability.

Because of the numerous risks and uncertainties associated with pharmaceutical product development, we are unable to accurately predict the timing or amount of increased expenses or when, or if, we will be able to achieve profitability. If we are required by the U.S. Food and Drug Administration, or the FDA, or the European Medicines Agency, or the EMA, to perform trials in addition to those currently expected, or if there are any delays in completing our clinical trials or the development of any of our product candidates, our expenses could increase.

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

In addition, our recurring losses from operations, accumulated deficit and our need to raise additional financing in order to continue to fund our operations, raise substantial doubt about our ability to continue as a going concern. If we are unable to obtain sufficient capital in this offering, our business, financial condition and results of operations will be materially and adversely affected and we will need to obtain alternative financing or significantly modify our operational plans to continue as a going concern. Further, even if we successfully complete and receive the net proceeds from this offering, given our planned expenditures for the next several years, including, without limitation, expenditures in connection with our clinical trials, our independent registered public accounting firm may conclude, in connection with the preparation of our financial statements for fiscal year 2014, or any other subsequent period, that there is substantial doubt regarding our ability to continue as a going concern.

***Our very limited operating history as a stand-alone company may make it difficult for you to evaluate the success of our business to date and to assess our future viability.***

We were formed as a wholly-owned subsidiary of Ikaria, Inc., or Ikaria, in October 2013 and became a stand-alone company in February 2014 following our spin-out from Ikaria, which we refer to as the Spin-Out, and, as such, have a very limited operating history as a stand-alone company. Prior to the Spin-Out, Ikaria assisted us by providing financing and certain corporate functions. Following the Spin-Out, Ikaria has no obligation to provide assistance to us other than on an interim basis as provided for in the agreements we entered into in connection with the Spin-Out. See "Certain Relationships and Related Person Transactions—Relationship with Ikaria."

Our operations to date have been limited to organizing and staffing our company, developing and securing our technology, and undertaking pre-clinical studies and clinical trials of our product candidates. We have not yet demonstrated the ability to successfully operate as a stand-alone company or to complete development of any product candidates, obtain marketing approvals, manufacture a commercial scale product, or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful product commercialization. Consequently, any predictions you make about our future success or viability may not be as accurate as they could be if we had a longer operating history or a history of successfully developing and commercializing products.

Assuming we obtain marketing approval for any of our product candidates, we will need to transition from a company with a research and development focus to a company capable of supporting commercial activities or we will need to enter into strategic partnerships. We may encounter unforeseen expenses, difficulties, complications and delays and may not be successful in such a transition.

***We will need substantial additional funding. If we are unable to raise capital when needed, we could be forced to delay, reduce or eliminate our product development programs or commercialization efforts.***

We expect our expenses to increase in connection with our ongoing activities, particularly as we initiate additional clinical trials of our INOpulse and BCM product candidates and continue research and development and seek regulatory approval for these and potentially other product candidates. In addition, if we obtain regulatory approval for any of our product candidates, we expect to incur significant commercialization expenses related to product manufacturing, marketing, sales and distribution. In particular, the costs that may be required for the manufacture of any product candidate that receives marketing approval may be substantial. Furthermore, upon the closing of this offering, we expect to incur additional costs associated with operating as a public company. As of September 30, 2014, we had cash and cash equivalents and restricted cash of \$43.7 million. From the inception of our business through September 30, 2014, Ikaria made cumulative investments of \$177.5 million in us and contributed an additional \$80.0 million to us in connection with the Spin-Out. Now that we are a stand-alone company, any additional funding will need to come from another source. 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 plan to use the net proceeds from this offering primarily to fund our ongoing research and development efforts. We will be required to expend significant funds in order to advance development of our INOpulse and BCM product candidates and any other potential product candidates. The net proceeds from this offering and our existing cash, cash equivalents and restricted cash will not be sufficient to fund all of the efforts that we plan to undertake, such as the further development of INOpulse for PH-COPD or BCM, or to fund completion of clinical development or commercialization of any of our product candidates. Accordingly, we will be required to obtain further funding through public or private equity offerings, debt financings, collaborations or licensing arrangements or other sources. Adequate additional funding may not be available to us on acceptable terms or at all. Our failure to raise capital as and when needed would have a negative impact on our financial condition and our ability to pursue our business strategy.

We believe that the net proceeds from this offering, together with our existing cash, cash equivalents and restricted cash as of September 30, 2014, will enable us to fund our operating expenses and capital expenditure requirements, as set forth below under "Use of Proceeds," for at least the next            months. We have based this estimate on assumptions that may prove to be wrong, and we could use our capital resources sooner than we currently expect. Our future capital requirements will depend on many factors, including:

- the progress and results of our current and planned clinical trials of our INOpulse and BCM product candidates;
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs of operating as a stand-alone company;
- the cost and timing of future commercialization activities, including product manufacturing, marketing, sales and distribution, for any of our product candidates for which we receive marketing approval;
- the revenue, if any, received from commercial sales of any product candidates for which we receive marketing approval;
- our ability to establish and maintain strategic partnerships, licensing or other arrangements and the financial terms of such agreements;

- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims;
- the scope, progress, results and costs of discovery, pre-clinical development and clinical trials for any other product candidates;
- the extent to which we acquire or in-license other product candidates and technologies;
- our headcount growth and associated costs; and
- the costs of operating as a public company.

Identifying potential product candidates and conducting pre-clinical studies and clinical trials 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. Our commercial revenues, if any, will be derived from sales of products that we do not expect to be commercially available for several years, if at all. Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Adequate additional financing may not be available to us on acceptable terms, or at all. 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.

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

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of public or private equity offerings, debt financings and/or license and development agreements with collaboration partners. We do not have any committed external source of funds. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest may be materially diluted, and the terms of such securities could 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 restrictive covenants that limit our ability to take specified actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves. If we raise funds through collaborations, strategic partnerships or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us.

## **Risks Related to Our Business and Industry**

***We may be unable to make, on a timely or cost-effective basis, the changes necessary to operate as a stand-alone company, and we may experience increased or unexpected costs after the Spin-Out or as a result of the Spin-Out.***

We have historically operated as part of Ikaria's broader corporate organization, and Ikaria has assisted us by providing certain corporate functions. However, following the Spin-Out, Ikaria is contractually obligated to provide to us only those services specified in the transition services agreement, or the TSA, and the other agreements we entered into with Ikaria to govern our relationship following the Spin-Out. See "Certain Relationships and Related Person Transactions—

Relationship with Ikaria" for a summary of these agreements. The TSA provides for certain services to be provided until February 2016. We may be unable to replace in a timely manner or on comparable terms the services or other benefits that Ikaria previously provided to us that are not specified in the TSA or the other agreements. Also, upon the termination of the services provided under the TSA or other agreements, such services will be provided internally or by unaffiliated third parties, and we expect that in some instances, we will incur higher costs to obtain such services than we incurred under the terms of such agreements. Ultimately, we may be unable to replace in a timely manner or on comparable terms the services specified in such agreements. In addition, during the transitional services period, we will rely, in part, on the same executive team at Ikaria that also will continue to manage the business of Ikaria during such time, and there may be conflicting demands on their time, which could result in an inadequate level of attention to the demands of our business. If Ikaria and its employees do not continue to perform effectively the transition services and the other services that are called for under the TSA and other agreements, we may not be able to operate our business effectively and our business and financial condition could be adversely affected.

Prior to the Spin-Out, we utilized the executive management team and administrative resources of Ikaria. Many daily functions were performed by Ikaria, including those related to the preparation of our financial statements and the engagement of auditors to audit our financial statements, which have become our responsibility following the Spin-Out. We may need to acquire assets and resources in addition to those provided to us by Ikaria, and we may face difficulty in integrating newly acquired assets into our business. Additionally, as a stand-alone company, we no longer have access to Ikaria's financial resources. Instead, our ability to fund our capital needs will depend on our ongoing ability to generate cash from operations, enter into partnering arrangements, obtain debt financing and access capital markets, which are subject to general economic, financial, competitive, regulatory and other factors that are beyond our control. Our business, financial condition and results of operations could be harmed, possibly materially, if we have difficulty operating as a stand-alone company, fail to acquire necessary capital or assets that prove to be important to our operations, or are unable to enter into partnering or other business development arrangements.

We also anticipate that we will incur additional incremental expenses associated with being a stand-alone company. These incremental pretax expenses are estimated to be \$3.0 million to \$5.0 million for the year ending December 31, 2014.

***Our historical and pro forma financial information is not necessarily representative of the results we would have achieved as a stand-alone company and may not be a reliable indicator of our future results.***

The historical financial and pro forma financial information we have included in this prospectus may not reflect what our results of operations, financial position and cash flows would have been had we been a stand-alone company during the periods presented. This is primarily because:

- our historical financial information reflects allocations for services historically provided to us by Ikaria, which allocations may not reflect the costs we will incur for similar services in the future as a stand-alone company; and
- our historical financial information does not reflect changes that we expect to incur in the future as a result of our separation from Ikaria and from reduced economies of scale, including changes in the cost structure, personnel needs, financing and operations of our business.

In addition, the pro forma financial information included in this prospectus is based on the best information available, which in part includes a number of estimates and assumptions. These estimates and assumptions may prove not to be accurate, and accordingly, our pro forma financial information should not be assumed to be indicative of what our financial condition or results of operations actually would have been as a stand-alone company, nor to be a reliable indicator of what our financial condition or results of operations actually may be in the future.

Following this offering, we also will be responsible for the additional costs associated with being a public company, including costs related to corporate governance and having listed and registered securities. Therefore, our financial statements may not be indicative of our future performance as a stand-alone public company.

For additional information about our past financial performance and the basis of presentation of our financial statements, please see "Summary Financial Information," "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and the notes thereto included elsewhere in this prospectus.

***The ownership by certain of our executive officers and directors of equity of Ikaria, as well as the continued roles of certain of our directors with Ikaria, may create, or may create the appearance of, conflicts of interest.***

Because of their current or former positions with Ikaria, our chief business officer, Manesh Naidu, our chief clinical development officer, Reinilde Heyrman, our chief scientific officer, Martin Meglasson, our treasurer, David Abrams, and two of our directors, Daniel Tassé and Howard Pien, own equity in Ikaria. In addition, two of our directors, Matthew Holt and Adam B. Weinstein, may be deemed to beneficially own equity in Ikaria. Such equity ownership may create, or may create the appearance of, conflicts of interest. The individual holdings of equity of Ikaria may be significant for some of these persons compared to such person's total assets. Ownership by certain of our executive officers and directors of equity of Ikaria creates, or may create the appearance of, conflicts of interest when these officers or directors are faced with decisions that could have different implications for Ikaria than the decisions have for us. In addition, Matthew Holt and Daniel Tassé are currently serving on our board of directors as well as Ikaria's board of directors, and Mr. Tassé is currently serving as the chief executive officer of Ikaria. We expect that following the consummation of this offering these directors will remain in their roles at both companies. The continued service at both companies creates, or may create the appearance of, conflicts of interest when these directors are faced with decisions that could have different implications for Ikaria than the decisions have for us, such as the allocation of time and resources to the provision of transitional services to us by Ikaria pursuant to the TSA and other agreements.

***We face substantial competition from other pharmaceutical, biotechnology and medical device companies and our operating results may suffer if we fail to compete effectively.***

The pharmaceutical, biotechnology and medical device industries are highly competitive. There are many pharmaceutical, biotechnology and medical device companies, public and private universities and research organizations actively engaged in the research and development of products that may be similar to our product candidates. In addition, other companies are increasingly looking at the cardiopulmonary and cardiac disease market as a potential opportunity. Currently, there are 12 drugs approved for the treatment of PAH, within the following categories: prostacyclin and prostacyclin analogs (including Flolan® (epoprostenol), which is marketed by GlaxoSmithKline, Tyvaso® (treprostinil), Orenitram® (treprostinil) and Remodulin® (treprostinil), which are marketed by United Therapeutics Corporation, and Ventavis® (iloprost) and Veletri® (epoprostenol), which are marketed by Actelion Pharmaceuticals US, Inc., or Actelion), phosphodiesterase type-5 inhibitors (including Adcirca® (tadalafil), which is marketed by United Therapeutics Corporation, and Revatio® (sildenafil), which is marketed by Pfizer Inc.), endothelin receptor antagonists (including Letairis® (ambrisentan), which is marketed by Gilead Sciences, Inc., and Opsumit® (macitentan) and Tracleer® (bosentan), which are marketed by Actelion) and a soluble guanylate cyclase stimulator (Adempas® (riociguat), which is marketed by Bayer HealthCare Pharmaceuticals Inc.). Actelion recently completed a Phase 3 clinical trial of selexipag, an additional potential prostacyclin. There are also other treatments in Phase 1 and Phase 2 clinical development, including other nitric oxide generation and delivery systems,



including GeNOsyl™, which is being developed by GeNO LLC, and a nebulized formulation of nitrite, which is being developed by Mast Therapeutics.

Currently, there are no approved therapies for treating PH-COPD, and the only generally accepted treatments are long-term oxygen therapy, pulmonary rehabilitation and lung transplant, and we are not aware of any therapies for PH-COPD in advanced clinical development.

There are no generally accepted products approved for structural support to prevent cardiac remodeling following an AMI. Other product candidates that are currently in clinical development include stem cell therapies to restore heart muscle cells following an AMI, with large Phase 3 trials expected to be completed in 2018 or 2019. We do not expect BCM to compete with, or replace, current treatments for congestive heart failure following AMI, but instead believe it will become part of the treatment regimen used in conjunction with other therapies. In addition, because BCM can be delivered by a minimally invasive percutaneous coronary intervention procedure, we do not believe it will directly compete with devices that are used to treat congestive heart failure, which are designed for administration during open heart surgery or by intra-cardiac injection involving a thoracotomy procedure. These include mesh restraining devices, for example HeartNet™; injectable biopolymers, for example Algisyl LVR™; and implantable electro stimulation devices, for example, CardioFit™. In addition, volume reduction surgery or cardiac assist devices, or pumps, are sometimes used to treat patients with congestive heart failure.

Many of our competitors, either alone or through their strategic partners, have substantially greater name recognition and financial, technical, manufacturing, marketing and human resources than we do and significantly greater experience and infrastructure in the research and clinical development of medical products, obtaining FDA and other regulatory approvals of those products, and commercializing those products around the world. Additional mergers and acquisitions in the pharmaceutical, biotechnology and medical device industries may result in even more resources being concentrated in our competitors. Large pharmaceutical and medical device companies in particular have extensive expertise in pre-clinical and clinical testing and in obtaining regulatory approvals for medical products. In addition, academic institutions, government agencies, and other public and private organizations conducting research may seek patent protection with respect to potentially competitive products or technologies. These organizations may also establish exclusive collaborative or licensing relationships with our competitors. Accordingly, our competitors may be more successful than we may be in obtaining approval for inhaled nitric oxide products and achieving widespread market acceptance. We anticipate that we will face intense and increasing competition as new products and technologies become available.

We will not be able to compete effectively unless we successfully:

- design, develop and commercialize products that are superior to other products in the market;
- attract qualified scientific, medical, sales and marketing, engineering and commercial personnel;
- obtain patent and/or other proprietary protection for our processes and product candidates; and
- obtain required regulatory approvals.

It is also possible that Ikaria will seek to develop and commercialize inhaled nitric oxide products or product candidates in PAH, PH-COPD and/or PH-IPF. While a subsidiary of Ikaria has granted to us an exclusive license to develop and commercialize pulsed nitric oxide in PAH, PH-COPD and PH-IPF and the scope of that license includes certain technology developed or acquired by that subsidiary after the date of the license agreement, the license does not include technology developed or acquired by other subsidiaries or affiliates of Ikaria. Because Ikaria and its subsidiaries and affiliates are not subject to any non-competition obligations in our favor, it is possible that these other subsidiaries or affiliates of Ikaria may seek to develop or commercialize inhaled nitric oxide or other products or product candidates, using technology not exclusively licensed to us, that are competitive with our products or product candidates.

## Risks Related to the Discovery, Development and Commercialization of Our Product Candidates

***We are dependent on the success of our INOpulse and BCM product candidates and our ability to develop, obtain marketing approval for and successfully commercialize these product candidates. If we are unable to develop, obtain marketing approval for or successfully commercialize our product candidates, either alone or through a collaboration, or experience significant delays in doing so, our business could be materially harmed.***

We currently have no products approved for sale and have invested a significant portion of our efforts and financial resources in the development of our INOpulse for PAH, INOpulse for PH-COPD and BCM product candidates. Our prospects are substantially dependent on our ability to develop, obtain marketing approval for and successfully commercialize these product candidates. The success of our product candidates will depend on, among other things, our ability to successfully complete clinical trials of each product candidate. The clinical trial process is uncertain, and failure of one or more clinical trials can occur at any stage of testing. For example, although we believe our recently completed Phase 2 clinical trials of INOpulse for PAH and INOpulse for PH-COPD support advancement into a Phase 3 and a Phase 2b clinical trial, respectively, the primary endpoints for both INOpulse for PAH and INOpulse for PH-COPD were not statistically significant for any of the doses tested.

In addition to the successful completion of clinical trials, the success of our product candidates will also depend on several other factors, including the following:

- receipt of marketing approvals from the FDA or other applicable regulatory authorities;
- establishment of supply arrangements with third-party raw materials suppliers and manufacturers;
- establishment of arrangements with third-party manufacturers to obtain finished drug products that are appropriately packaged for sale;
- the performance of our future collaborators for one or more of our product candidates, if any;
- the extent of any required post-marketing approval commitments to applicable regulatory authorities;
- obtaining and maintaining patent, trade secret protection and regulatory exclusivity, both in the United States and internationally;
- protection of our rights in our intellectual property portfolio;
- launch of commercial sales if and when our product candidates are approved;
- a continued acceptable safety profile of our product candidates following any marketing approval;
- commercial acceptance, if and when approved, by patients, the medical community and third-party payors;
- establishing and maintaining pricing sufficient to realize a meaningful return on our investment; and
- competition with other products.

If we are unable to develop, receive marketing approval for, or successfully commercialize our product candidates, or experience delays as a result of any of these factors or otherwise, our business could be materially harmed.

***Clinical trials involve a lengthy and expensive process with an uncertain outcome. We may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.***

We recently completed Phase 2 clinical trials of INOpulse for PAH and INOpulse for PH-COPD and are currently conducting a clinical trial of BCM. The risk of failure of all of our product candidates is high. It is impossible to predict when or if any of our product candidates will prove effective or safe in humans or will receive regulatory approval. Before obtaining marketing approval from regulatory authorities for the sale of any product candidate, we must conduct extensive clinical trials to demonstrate the safety and efficacy of our product candidates in humans. Clinical testing is expensive, difficult to design and implement, can take many years to complete and is uncertain as to outcome. A failure of one or more clinical trials can occur at any stage of testing. The clinical development of our product candidates is susceptible to the risk of failure inherent at any stage of development, including failure to demonstrate efficacy in a clinical trial or across a broad population of patients, the occurrence of severe or medically or commercially unacceptable adverse events, failure to comply with protocols or applicable regulatory requirements and determination by the FDA or any comparable non-U.S. regulatory authority that a drug product is not approvable. For example, although we believe our recently completed Phase 2 clinical trials of INOpulse for PAH and INOpulse for PH-COPD support advancement into a Phase 3 and a Phase 2b clinical trial, respectively, the primary endpoints for both INOpulse for PAH and INOpulse for PH-COPD were not statistically significant for any of the doses tested.

It is possible that even if one or more of our product candidates has a beneficial effect, that effect will not be detected during clinical evaluation as a result of one or more of a variety of factors, including the size, duration, design, measurements, conduct or analysis of our clinical trials. Conversely, as a result of the same factors, our clinical trials may indicate an apparent positive effect of a product candidate that is greater than the actual positive effect, if any. Similarly, in our clinical trials we may fail to detect toxicity of or intolerability caused by our product candidates, or mistakenly believe that our product candidates are toxic or not well tolerated when that is not in fact the case. Also, the exclusion criteria we define may not sufficiently rule out patients who are at a higher risk of being harmed by the treatment. For example, our exclusion criteria for pre-existing left heart dysfunction in our recently completed Phase 2 INOpulse clinical trials may not rule out patients who may experience an adverse event related to left ventricular function due to exposure to nitric oxide. In addition, patients who are not excluded for reactive pulmonary vasculature when exposed to nitric oxide may still experience pulmonary hypertension.

The outcome of pre-clinical studies and early clinical trials may not be predictive of the success of later clinical trials, and interim results of a clinical trial do not necessarily predict final results, particularly when earlier trials are small, open-label or non-placebo-controlled trials and in trials that have different endpoints than earlier trials. For example, we are relying on the results from a 32-patient Phase 2 PH-COPD trial, conducted in Austria, as part of our clinical development program of INOpulse for PH-COPD, and we may not be able to replicate the results of this trial in a larger trial or in a trial that uses a clinical endpoint rather than the anatomical endpoints used in the 32-patient trial. Similarly, for BCM, we are using the results of the 27-patient pilot trial conducted by BioLineRx Ltd. that used anatomical changes to measure efficacy and did not have a control group as support for our larger ongoing clinical trial, which may not achieve the same results as the BioLineRx Ltd. trial. Many companies in the biotechnology, pharmaceutical and medical device industries have suffered significant setbacks in late-stage clinical trials after achieving positive results in earlier development, and we cannot be certain that we will not face such setbacks.

The design of a clinical trial can determine whether its results will support approval of a product, and flaws in the design of a clinical trial may not become apparent until the clinical trial is well advanced or completed. We have limited experience in designing clinical trials and may be unable to

design and execute a clinical trial to support marketing approval. In addition, pre-clinical and clinical data are often susceptible to varying interpretations and analyses. Many companies that believed their product candidates performed satisfactorily in pre-clinical studies and clinical trials have nonetheless failed to obtain marketing approval for the product candidates. Even if we believe that the results of clinical trials for our product candidates warrant marketing approval, the FDA or comparable non-U.S. regulatory authorities may disagree and may not grant marketing approval of our product candidates.

In some instances, there can be significant variability in safety or efficacy results between different clinical trials of the same product candidate due to numerous factors, including changes in trial procedures set forth in protocols, differences in the size and type of the patient populations, changes in and adherence to the clinical trial protocols and the rate of dropout among clinical trial participants. Any Phase 3 or other clinical trials that we may conduct may not demonstrate the efficacy and safety necessary to obtain regulatory approval to market our product candidates.

***INOpulse is a sophisticated electro-mechanical device comprised of components that may fail or deteriorate over time or with improper use. If we experience problems with, failure of, or delays in obtaining any INOpulse components, our business could be materially adversely harmed.***

Because INOpulse is a sophisticated electro-mechanical device, the parts which comprise the device are subject to sudden failure or to wear and tear, which may result in decreased function or failure of those parts over time. Although we perform scheduled, preventive maintenance on our drug delivery system to limit device failures, and additional maintenance as needed whenever a user reports a device malfunction, components of our devices may fail. In addition, although we have designed INOpulse to be simple and easy to use and will provide user manuals and other training materials, users of INOpulse may use the devices improperly, which could cause the devices to fail or otherwise not work properly.

There are several components in INOpulse that are custom designed or assembled for us. We are dependent on a single company to supply us with some of these components. While we believe there are alternative suppliers from which we could purchase most of these components, there is a risk that a single-source supplier could fail to deliver adequate supply, or could suffer a business interruption that could affect our supply of these components.

We obtain some of the components for INOpulse through individual purchase orders executed on an as needed basis rather than pursuant to long-term supply agreements. Our business, financial condition or results of operations could be adversely affected if any of our principal third-party suppliers or manufacturers experience production problems, lack of capacity or transportation disruptions or otherwise cease producing such components.

***We are transitioning our INOpulse delivery system to a next generation device that was not utilized in our recently completed INOpulse Phase 2 clinical trials. Failure by the FDA or other regulatory authority to support the transition and bridging strategy for our transition to the new device could increase our development costs and/or delay commencement of our future clinical trials of INOpulse.***

Our recently completed INOpulse Phase 2 clinical trials utilized the first generation INOpulse DS device. We are near completion of a second generation INOpulse Mark2 device, or the Mark2, and we plan to transition our INOpulse delivery system from INOpulse DS to the Mark2 for any future INOpulse clinical trials. To facilitate the transition from our existing INOpulse DS device to the Mark2 in our clinical program, we plan to conduct comparability testing of nitric oxide dosing with the Mark2 as compared to the INOpulse DS device. This testing will include a comparison of critical parameters, including pulse width and nitric oxide output. We will also assess whether the Mark2 will meet the performance specifications of the INOpulse DS device in addition to Mark2-specific requirements. In addition, we are developing a bridging test report that we expect to include in the regulatory package

that we anticipate submitting to the FDA during the first quarter of 2015 to gain approval for the device transition. We discussed our strategy with the FDA during a meeting in May 2013, and we believe that, assuming the Mark2 meets the specified comparability parameters, this testing will be sufficient to gain FDA approval to use the Mark2 in future clinical trials, as planned. The FDA may not agree that our data support transition to this new device, in which case we may be required to provide additional data, perform a revised bridging assessment or repeat the Phase 2 clinical trial, any of which could increase our development costs and/or delay or prevent commencement of these future clinical trials. In addition, even if the FDA accepts our transition plan, use of the Mark2 in future clinical trials could produce results that are different than those we would expect based on the results from the Phase 2 clinical trial using the INOpulse DS device.

***We intend to conduct, and may in the future conduct, clinical trials for certain of our product candidates at sites outside the United States, and the FDA may not accept data from trials conducted in such locations.***

We have conducted, and may in the future choose to conduct, one or more of our clinical trials outside the United States. For example, our Phase 2 clinical trial of INOpulse for PAH included sites in Canada and our clinical trial of BCM includes sites in Europe, Canada, Australia and Israel.

Although the FDA may accept data from clinical trials conducted outside the United States, acceptance of this data is subject to certain conditions imposed by the FDA. For example, the clinical trial must be well designed and conducted and performed by qualified investigators in accordance with good clinical practices, or GCP, in the case of drug trials, or the Declaration of Helsinki or the laws and regulations of the country in which the research is conducted, whichever affords greater protection to the human subjects, in the case of device trials. The trial population must also adequately represent the U.S. population, and the data must be applicable to the U.S. population and U.S. medical practice in ways that the FDA deems clinically meaningful. Generally, the patient population for any clinical trials conducted outside of the United States must be representative of the population for whom we intend to seek approval in the United States. In addition, while these clinical trials are subject to the applicable local laws, FDA acceptance of the data will be dependent upon its determination that the trials also complied with all applicable U.S. laws and regulations. There can be no assurance that the FDA will accept data from trials conducted outside of the United States. If the FDA does not accept the data from our Phase 2 clinical trial of INOpulse for PAH in Canada or our clinical trial of BCM in Europe, Canada, Australia or Israel, or any future trial that we conduct outside the United States, it would likely result in the need for additional trials, which would be costly and time-consuming and delay or permanently halt our development of INOpulse for PAH and BCM or any future product candidates.

In addition, the conduct of clinical trials outside the United States could have a significant impact on us. Risks inherent in conducting international clinical trials include:

- foreign regulatory requirements that could restrict or limit our ability to conduct our clinical trials;
- administrative burdens of conducting clinical trials under multiple foreign regulatory schema;
- foreign exchange fluctuations; and
- diminished protection of intellectual property in some countries.

***If clinical trials of our product candidates fail to demonstrate safety and efficacy of our product candidates to the satisfaction of the FDA and comparable non-U.S. regulators, we may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of these product candidates.***

We are not permitted to commercialize, market, promote or sell any product candidate in the United States without obtaining marketing approval from the FDA. Comparable non-U.S. regulatory authorities, such as the EMA, impose similar restrictions. We may never receive such approvals. We must complete extensive pre-clinical studies and clinical trials to demonstrate the safety and efficacy of our product candidates in humans before we will be able to obtain these approvals.

Clinical testing is expensive, difficult to design and implement, can take many years to complete and is inherently uncertain as to outcome. We have not previously submitted a new drug application, or an NDA, to the FDA or similar drug approval filings to comparable non-U.S. regulatory authorities for any of our product candidates.

Any inability to successfully complete pre-clinical and clinical development could result in additional costs to us and impair our ability to generate revenues from product sales. In addition, if (1) we are required to conduct additional clinical trials or other testing of our product candidates beyond the trials and testing that we contemplate, (2) we are unable to successfully complete clinical trials of our product candidates or other testing, (3) the results of these trials or tests are unfavorable, uncertain or are only modestly favorable, such as in our Phase 2 clinical trials of INOpulse for PAH and INOpulse for PH-COPD, or (4) there are unacceptable safety concerns associated with our product candidates, we, in addition to incurring additional costs, may:

- be delayed in obtaining marketing approval for our product candidates;
- not obtain marketing approval at all;
- obtain approval for indications or patient populations that are not as broad as we intended or desired;
- obtain approval with labeling that includes significant use or distribution restrictions or significant safety warnings, including boxed warnings;
- be subject to additional post-marketing testing or other requirements; or
- be required to remove the product from the market after obtaining marketing approval.

For example, the FDA has granted us an investigational device exemption, or IDE, for our ongoing clinical trial of BCM, which we refer to as our PRESERVATION I trial, which currently limits at 60 the number of patients we can enroll in the United States. This limitation is due to the novelty of BCM and the lack of prior data on administration to human patients of four milliliters of BCM that we are using in the trial because we did not conduct a pilot study of BCM with the four milliliter volume. Due to the lack of a pilot study or other data supporting the safety or efficacy of four milliliters of BCM in human patients, the FDA may require that, prior to approval, we conduct additional trials of BCM or that we provide additional data to support the safety and/or efficacy of four milliliters of BCM in human patients.

In addition, the FDA has asked us to conduct a study to test the environmental impact of using INOpulse at home. When inhaled nitric oxide is administered through INOpulse, a small portion of the nitric oxide will be exhaled or otherwise emitted and could react with oxygen in room air to form nitrogen dioxide, which is an environmental pollutant. The study will measure the nitrogen dioxide in the room air with use of INOpulse under actual or simulated patient use conditions. If the FDA or other regulatory authority requires us to conduct additional testing or determines that an unacceptable amount of nitrogen dioxide is formed through the use of INOpulse, we may be required to alter the

design of INOpulse, which may not be possible, and the clinical development timeline for INOpulse may be delayed or prove to be more costly than we currently anticipate.

***If we experience any of a number of possible unforeseen events in connection with clinical trials of our product candidates, potential marketing approval or commercialization of our product candidates could be delayed or prevented.***

We may experience numerous unforeseen events during, or as a result of, clinical trials that could delay or prevent marketing approval of our product candidates, including:

- clinical trials of our product candidates may produce unfavorable or inconclusive results;
- we may decide, or regulators may require us, to conduct additional clinical trials or abandon product development programs;
- the number of patients required for clinical trials of our product candidates may be larger than we anticipate, patient enrollment in these clinical trials may be slower than we anticipate or participants may drop out of these clinical trials at a higher rate than we anticipate;
- our third-party contractors, including those manufacturing our product candidates or components or ingredients thereof or conducting clinical trials on our behalf, may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner or at all;
- regulators or institutional review boards may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we may experience delays in reaching or fail to reach agreement on acceptable clinical trial contracts or clinical trial protocols with prospective trial sites;
- patients who enroll in a clinical trial may misrepresent their eligibility to do so or may otherwise not comply with the clinical trial protocol, resulting in the need to withdraw such patients from the clinical trial, increase the needed enrollment size for the clinical trial or extend the clinical trial's duration;
- we may have to suspend or terminate clinical trials of our product candidates for various reasons, including a finding that the participants are being exposed to unacceptable health risks, undesirable side effects or other unexpected characteristics of a product candidate;
- regulators or institutional review boards may require that we or our investigators suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements or their respective standards of conduct, a finding that the participants are being exposed to unacceptable health risks, undesirable side effects or other unexpected characteristics of the product candidate or findings of undesirable effects caused by a chemically or mechanistically similar drug or drug candidate;
- the FDA or comparable non-U.S. regulatory authorities may disagree with our clinical trial design or our interpretation of data from pre-clinical studies and clinical trials;
- the FDA or comparable non-U.S. regulatory authorities may find regulatory non-compliance with the manufacturing processes or facilities of third-party manufacturers with which we enter into agreements for clinical and commercial supplies;

- the supply or quality of raw materials or manufactured product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient, inadequate or not available at an acceptable cost, or we may experience interruptions in supply; and
- the approval policies or regulations of the FDA or comparable non-U.S. regulatory authorities may significantly change in a manner rendering our clinical data insufficient to obtain marketing approval.

Product development costs for us will increase if we experience delays in testing or pursuing marketing approvals and we may be required to obtain additional funds to complete clinical trials and prepare for possible commercialization of our product candidates. We do not know whether any pre-clinical studies or clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. For example, although we recently completed a Phase 2 clinical trial for INOpulse for PH-COPD, we are currently evaluating our options for further Phase 2 development in this indication. Significant pre-clinical study or clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before we do and impair our ability to successfully commercialize our product candidates and may harm our business and results of operations. In addition, many of the factors that cause, or lead to, clinical trial delays may ultimately lead to the denial of marketing approval of any of our product candidates.

***If we experience delays or difficulties in the enrollment of patients in clinical trials, we may not achieve our clinical development on our anticipated timeline, or at all, and our receipt of necessary regulatory approvals could be delayed or prevented.***

We may not be able to initiate or continue clinical trials for our INOpulse or BCM product candidates if we are unable to locate and enroll a sufficient number of eligible patients to participate in clinical trials. Patient enrollment is a significant factor in the timing of clinical trials, and is affected by many factors, including:

- the size and nature of the patient population;
- the severity of the disease under investigation;
- the proximity of patients to clinical sites;
- the eligibility criteria for the trial;
- the design of the clinical trial;
- limitations placed on enrollment by regulatory authorities;
- efforts to facilitate timely enrollment;
- competing clinical trials; and
- clinicians' and patients' perceptions as to the potential advantages and risks of the product candidate being studied in relation to other available therapies, including any new product candidates that may be approved for the indications we are investigating.

For example, we may experience difficulty enrolling our clinical trials, including, but not limited to, any future clinical trials of INOpulse for PAH, which is an orphan disease due to the small number of patients who suffer from PAH, or any future clinical trials of INOpulse for PH-COPD because such trials may require that patients meet the restrictive enrollment criteria, such as having been diagnosed with both COPD and pulmonary hypertension, be undergoing treatment with long-term oxygen therapy and not having significant left ventricular dysfunction.



In addition, with respect to our PRESERVATION I trial, the FDA has limited us to enrolling a maximum of 60 patients in the United States. This limitation is due to the novelty of BCM and the lack of prior data on the administration to human patients of four milliliters of BCM that we are using in the trial because we did not conduct a pilot study of BCM with this dose. We will need to obtain the FDA's approval of any expansion of this U.S. enrollment cap, and such approval would likely be based on our submission of data to the FDA supporting the safety of four milliliters of BCM in human patients, if any. The Israeli Ministry of Health is also requiring that we submit to it additional safety data once 70 patients are enrolled in Israel.

Our inability to enroll a sufficient number of patients for our clinical trials could result in significant delays or may require us to abandon one or more clinical trials altogether. Enrollment delays in our clinical trials may result in increased development costs for our product candidates, delay or halt the development of and approval processes for our product candidates and jeopardize our ability to achieve our clinical development timeline and goals, including the dates by which we will commence, complete and receive results from clinical trials. Enrollment delays may also delay or jeopardize our ability to commence sales and generate revenues from our product candidates. Any of the foregoing could cause the value of our company to decline and limit our ability to obtain additional financing, if needed.

***We may not obtain orphan drug exclusivity, or we may not receive the full benefit of orphan drug exclusivity even if we obtain such exclusivity.***

Regulatory authorities in some jurisdictions, including the United States and European Union, may designate drugs and biologics for relatively small patient populations as orphan drugs. Under the Orphan Drug Act, the FDA may designate a product as an orphan drug if it is a drug or biologic intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200,000 individuals in the United States who have been diagnosed as having the disease or condition at the time of the submission of the request for orphan drug designation. The FDA has granted orphan drug designation to our nitric oxide program for the treatment of PAH. Accordingly, the first company to receive FDA approval for nitric oxide for the treatment of PAH will obtain seven years of marketing exclusivity, during which time the FDA may not approve another product containing nitric oxide as its active ingredient for the treatment of PAH, unless such product is shown to be clinically superior.

Even though we have obtained orphan drug designation for our nitric oxide program to treat PAH, and even if we obtain orphan drug designation for our product candidates in other indications or for our future product candidates, due to the uncertainties associated with developing pharmaceutical products, we may not be the first to obtain marketing approval for any particular orphan indication, or we may not obtain approval for an indication for which we have obtained orphan drug designation. Further, even if we obtain orphan drug exclusivity for a product candidate, that exclusivity may not protect the product effectively from competition because different drugs can be approved for the same condition. Even after an orphan drug is approved, the FDA can subsequently approve the same drug for the same condition if the FDA concludes that the later drug is 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. Orphan drug exclusivity may be lost if the FDA determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the product to meet the needs of patients with the rare disease or condition.

***Serious adverse events or undesirable side effects or other unexpected properties of our product candidates may be identified during development that could delay or prevent the product candidate's marketing approval.***

Serious adverse events or undesirable side effects caused by, or other unexpected properties of, our product candidates could cause us, an institutional review board or regulatory authorities to interrupt, delay or halt clinical trials of one or more of our product candidates and could result in a more restrictive label or the delay or denial of marketing approval by the FDA or comparable non-U.S. regulatory authorities. If any of our product candidates is associated with serious adverse events or undesirable side effects or has properties that are unexpected, we may need to abandon development or limit development of that product candidate to certain 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. Many drugs or devices that initially showed promise in clinical or earlier stage testing have later been found to cause undesirable or unexpected side effects that prevented further development of the drug or device.

For example, in our recently completed Phase 2 clinical trial for INOpulse for PAH, serious adverse events were reported for four patients in the 25 mcg/kg ideal body weight/hour, or mcg, low-dose active treatment arm, including bacteremia, myelodysplastic syndrome, increased shortness of breath and dyspnea, one of which was assessed as possibly related to trial therapy. In the 75 mcg high-dose active treatment arm, nine patients had serious adverse events. The most common serious adverse events reported were syncope and bronchitis/tracheobronchitis, one of which was assessed as possibly related to trial therapy. Discontinuation of trial therapy due to adverse events occurred for two patients in the 75 mcg arm and one subject in the 25 mcg arm. Additional or more serious adverse events, undesirable side effects or other unexpected properties of INOpulse for PAH or our other product candidates could arise or become known either during further clinical development. If such an event occurs during development, clinical trials for our product candidates could be suspended or terminated and the FDA or comparable foreign regulatory authorities could order us or our collaborators to cease further development, require us to conduct additional clinical trials or other tests or studies or deny approval of the applicable product candidate. Further, pending discussions with regulatory authorities, we may be required to conduct a drug-drug interaction study of INOpulse for PH-COPD. We expect the FDA to require us primarily to study interactions with long-acting beta agonists, which is the only class of COPD drug that has been identified as having potential adverse cardiac side effects, to confirm that pulsed inhaled nitric oxide does not increase systemic bio-availability of inhaled beta agonists. If the results of such a study indicate increased bioavailability that we are not able to address to the satisfaction of the FDA, marketing approval of INOpulse for PH-COPD, if any, may be limited to patients who do not use long-acting beta agonists.

Additionally, INOpulse is an extension of the technology that is used in hospitals to deliver inhaled nitric oxide to neonates with a form of pulmonary hypertension called persistent pulmonary hypertension of the newborn. Persistent pulmonary hypertension is an FDA-approved use of inhaled nitric oxide, which is currently marketed by Ikaria as INOmax. Because INOpulse draws on the established efficacy and safety of INOmax, if any serious adverse events or undesirable side effects or other unexpected properties of INOmax or other inhaled nitric oxide delivery systems developed by Ikaria are identified, INOpulse may be adversely affected and we may be required to interrupt, delay or halt our INOpulse clinical trials.

***We may not be successful in our efforts to identify or discover additional potential product candidates.***

A significant portion of the research that we are conducting involves the development of innovative approaches to the pulsed delivery of nitric oxide. Our drug-device discovery efforts may not be successful in creating drugs or devices that have commercial value or therapeutic utility. Our research programs may initially show promise in creating potential product candidates, yet fail to yield viable product candidates for clinical development for a number of reasons, including that potential

product candidates may, on further study, be shown to have harmful side effects or other characteristics that indicate that they are unlikely to be product candidates that will receive marketing approval and achieve market acceptance. Currently, we are dependent on Ikaria for our business development functions pursuant to the TSA and lack the capability to bring such functions in-house. Accordingly, if Ikaria does not perform such business development functions effectively, our business and prospects may be materially and adversely affected.

Our research programs to identify new product candidates will require substantial technical, financial and human resources. We may be unsuccessful in our efforts to identify new potential product candidates. In addition, we may focus our efforts and resources on one or more potential product candidates that ultimately prove to be unsuccessful.

Pursuant to the terms of our license agreement with Ikaria, we only have the right to develop and commercialize pulsed nitric oxide in PAH, PH-COPD and PH-IPF; Ikaria retains the right to develop and commercialize inhaled nitric oxide products, including pulsed products, in all other indications. Additionally, we are limited in the scope of potential product candidates that we can identify or discover due to non-competition agreements that we entered into with Ikaria. Pursuant to these agreements, we and each of our subsidiaries agreed not to engage, anywhere in the world, in any manner, directly or indirectly, until the earlier of five years after the effective date of such non-competition agreement or the date on which Ikaria and all of its subsidiaries are no longer engaged in such business, in:

- the development, manufacture, commercialization, promotion, sale, import, export, servicing, repair, training, storage, distribution, transportation, licensing, or other handling or disposition of any product or service (including, without limitation, any product or service that utilizes, contains or includes nitric oxide for inhalation, a device intended to deliver nitric oxide or a service that delivers or supports the delivery of nitric oxide), bundled or unbundled, for or used in connection with (a) the diagnosis, prevention or treatment, in both adult and/or pediatric populations, and whether in- or out-patient, of: (i) hypoxic respiratory failure associated with pulmonary hypertension, (ii) pulmonary hypertensive episodes and right heart failure associated with cardiovascular surgery, (iii) bronchopulmonary dysplasia, (iv) the management of ventilation-perfusion mismatch in acute lung injury, (v) the management of ventilation-perfusion mismatch in acute respiratory distress syndrome, (vi) the management of pulmonary hypertension episodes and right heart failure in congestive heart failure, (vii) pulmonary edema from high altitude sickness, (viii) the management of pulmonary hypertension episodes and right heart failure in pulmonary or cardiac surgery, (ix) the management of pulmonary hypertension episodes and right heart failure in organ transplant, (x) sickle cell vaso-occlusive crisis, (xi) hypoxia associated with pneumonia or (xii) ischemia-reperfusion injury or (b) the use of nitric oxide to treat or prevent conditions that are primarily managed in the hospital; or
- any and all development, manufacture, commercialization, promotion, sale, import, export, storage, distribution, transportation, licensing, or other handling or disposition of any terlipressin or any other product within the pressin family, (a) intended to treat (i) hepatorenal syndrome in any form, (ii) bleeding esophageal varices or (iii) septic shock or (b) for or in connection with the management of low blood pressure.

In the event that we or one of our subsidiaries materially breach the provisions of the non-competition agreements and do not cure such breach within 30 days after receiving written notice thereof from Ikaria, Ikaria will have the right to terminate the license agreement.

If we are unable to identify suitable additional compounds for pre-clinical and clinical development, or at all, our ability to develop product candidates and obtain product revenues in future periods could be compromised, which could result in significant harm to our financial position and adversely impact our stock price.

***If any of our product candidates receives marketing approval and we, or others, later discover that the product is less effective than previously believed or causes undesirable side effects that were not previously identified, our ability to market the product could be compromised.***

Clinical trials of our product candidates are conducted in carefully defined subsets of patients who have agreed to enter into clinical trials. Consequently, it is possible that our clinical trials may indicate an apparent positive effect of a product candidate that is greater than the actual positive effect, if any, or alternatively fail to identify undesirable side effects. If, following approval of a product candidate, we, or others, discover that the drug is less effective than previously believed or causes undesirable side effects that were not previously identified, any of the following undesirable events could occur:

- regulatory authorities may withdraw their approval of the product or seize the product;
- we may be required to recall the product or change the way the product is administered;
- additional restrictions may be imposed on the marketing of, or the manufacturing processes for, the particular product;
- we may be subject to fines, injunctions or the imposition of civil or criminal penalties;
- regulatory authorities may require the addition of labeling statements, such as a "black box" warning or a contraindication;
- we may be required to create a handout, sometimes referred to as a Medication Guide, outlining the risks of the previously unidentified side effects for distribution to patients;
- we could be sued and held liable for harm caused to patients;
- the product may become less competitive; and
- our reputation may suffer.

Any of these events could have a material and adverse effect on our operations and business and could adversely impact our stock price.

***Even if one of our product candidates receives marketing approval, it may fail to achieve the degree of market acceptance by physicians, patients, third-party payors and others in the medical community necessary for commercial success, and the market opportunity for the product candidate may be smaller than we estimate.***

We have never commercialized a product. Even if one of our product candidates is approved by the appropriate regulatory authorities for marketing and sale, it may nonetheless fail to gain sufficient market acceptance by physicians, patients, third-party payors and others in the medical community. For example, physicians are often reluctant to switch their patients from existing therapies even when new and potentially more effective or convenient treatments enter the market. Further, patients often acclimate to the therapy that they are currently taking and do not want to switch unless their physicians recommend switching products or they are required to switch therapies due to lack of reimbursement for existing therapies.

Efforts to educate the medical community and third-party payors on the benefits of our product candidates may require significant resources and may not be successful. If any of our product candidates is approved but does not achieve an adequate level of market acceptance, we may not generate significant revenues and we may not become profitable. The degree of market acceptance of, and potential market opportunity for, our product candidates, if approved for commercial sale, will depend on a number of factors, including:

- the efficacy and safety of the product;
- the potential advantages of the product compared to alternative treatments;

- the prevalence and severity of any side effects;
- the clinical indications for which the product is approved;
- whether the product is designated under physician treatment guidelines as a first-line therapy or as a second- or third-line therapy;
- limitations or warnings, including distribution or use restrictions, contained in the product's approved labeling;
- our ability to offer the product for sale at competitive prices;
- our ability to establish and maintain pricing sufficient to realize a meaningful return on our investment;
- our ability to prevent use of our INOpulse for PH-COPD device by PAH patients due to expected pricing differences;
- the product's convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try, and of physicians to prescribe, the product;
- the strength of sales, marketing and distribution support;
- the approval of other new products for the same indications;
- changes in the standard of care for the targeted indications for the product;
- the timing of market introduction of our approved products as well as competitive products and other therapies;
- availability and amount of reimbursement from government payors, managed care plans and other third-party payors;
- adverse publicity about the product or favorable publicity about competitive products; and
- potential product liability claims.

The potential market opportunities for our product candidates are difficult to estimate precisely. Our estimates of the potential market opportunities, including our estimates with respect to pricing and reimbursement, are predicated on many assumptions, including industry knowledge and publications, third-party research reports and other surveys. While we believe that our internal assumptions are reasonable, these assumptions involve the exercise of significant judgment on the part of our management, are inherently uncertain and the reasonableness of these assumptions has not been assessed by an independent source. If any of the assumptions proves to be inaccurate, the actual markets for our product candidates could be smaller than our estimates of the potential market opportunities.

***If we are unable to establish sales, marketing and distribution capabilities or enter into acceptable sales, marketing and distribution arrangements with third parties, we may not be successful in commercializing any product candidates that we develop, if and when those product candidates are approved.***

We do not have a sales, marketing or distribution infrastructure and have limited experience in the sale, marketing and distribution of pharmaceutical products. To achieve commercial success for any approved product, we must either develop a sales and marketing organization or outsource these functions to third parties. We expect to build a commercial infrastructure to allow us to market and sell certain of our product candidates when approved, if any, using a specialty sales force in the United States, and we may choose to establish commercialization capabilities in select countries outside the United States. The development of sales, marketing and distribution capabilities will require substantial

resources, will be time-consuming and could delay any product launch. We expect that we will commence the development of these capabilities prior to receiving approval of any of our product candidates. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing and distribution capabilities is delayed or does not occur for any reason, we could have prematurely or unnecessarily incurred these commercialization costs. Such a delay may be costly, and our investment could be lost if we cannot retain or reposition our sales and marketing personnel. In addition, we may not be able to hire or retain a sales force in the United States that is sufficient in size or has adequate expertise in the medical markets that we plan to target. If we are unable to establish or retain a sales force and marketing and distribution capabilities, our operating results may be adversely affected. If a potential partner has development or commercialization expertise that we believe is particularly relevant to one of our product candidates, then we may seek to collaborate with that potential partner even if we believe we could otherwise develop and commercialize the product independently.

We may partner with third parties to commercialize our product candidates in certain countries outside the United States. As a result of entering into arrangements with third parties to perform sales, marketing and distribution services, our product revenues or the profitability of these product revenues may be lower, perhaps substantially lower, than if we were to directly market and sell products in those markets. Furthermore, we may be unsuccessful in entering into the necessary arrangements with third parties or may be unable to do so on terms that are favorable to us. In addition, we may have little or no control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market our product candidates effectively.

If we do not establish sales and marketing capabilities, either on our own or in collaboration with third parties, we will not be successful in commercializing any of our product candidates that receive marketing approval.

***Even if we are able to commercialize any product candidate that we develop, the product may become subject to unfavorable pricing regulations, third-party payor reimbursement practices or healthcare reform initiatives that could harm our business.***

The commercial success of our product candidates will depend substantially, both in the United States and abroad, on the extent to which the costs of our product candidates will be paid by health maintenance, managed care, pharmacy benefit and similar healthcare management organizations, or reimbursed by government health administration authorities, private health coverage insurers and other third-party payors. If reimbursement is not available, or is available only to limited levels, we may not be able to successfully commercialize our product candidates. Even if coverage is provided, the approved reimbursement amount may not be high enough to allow us to establish and maintain pricing sufficient to realize a meaningful return on our investment.

There is significant uncertainty related to third-party payor coverage and reimbursement of newly approved drugs and devices. Marketing approvals, pricing and reimbursement for new drug and device products vary widely from country to country. Some countries require approval of the sale price of a drug or device before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some non-U.S. markets, pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain marketing approval for a product in a particular country, but then be subject to price regulations that delay commercial launch of the product, possibly for lengthy time periods, which may negatively impact the revenues we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if our product candidates obtain marketing approval.

Our ability to commercialize our product candidates will depend in part on the extent to which coverage and reimbursement for these products and related treatments will be available from government health administration authorities, private health insurers and other organizations. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will cover and establish reimbursement levels. The healthcare industry is acutely focused on cost containment, both in the United States and elsewhere. Government authorities and third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications, which could affect our ability to sell our product candidates profitably. These payors may not view our products, if any, as cost-effective, and coverage and reimbursement may not be available to our customers, or may not be sufficient to allow our products, if any, to be marketed on a competitive basis. Cost-control initiatives could cause us to decrease the price we might establish for products, which could result in lower than anticipated product revenues. If the prices for our products, if any, decrease or if governmental and other third-party payors do not provide adequate coverage or reimbursement, our prospects for revenue and profitability will suffer. Approval of a product does not guarantee sufficient reimbursement to commercialize. For example, assuming positive results, approval of CE marking for BCM in the European Union may be achieved with our ongoing clinical trial but, based on current reimbursement practices in the European Union, this data may not be sufficient to gain sufficient reimbursement for us to invest in commercialization activities.

There may also be delays in obtaining coverage and reimbursement for newly approved products, and coverage may be more limited than the indications for which the product is approved by the FDA or comparable non-U.S. regulatory authorities. Moreover, eligibility for reimbursement does not imply that any product will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution. Reimbursement rates may vary, by way of example, according to the use of the product and the clinical setting in which it is used. Reimbursement rates may also be based on reimbursement levels already set for lower cost products or may be incorporated into existing payments for other services.

In addition, increasingly, third-party payors are requiring higher levels of evidence of the benefits and clinical outcomes of new technologies and are challenging the prices charged. We cannot be sure that coverage will be available for any product candidate that we commercialize and, if available, that the reimbursement rates will be adequate. Further, the net reimbursement for drug products may be subject to additional reductions if there are changes to laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. An inability to promptly obtain coverage and adequate payment rates from both government-funded and private payors for any our product candidates for which we obtain marketing approval could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products and our overall financial condition.

We anticipate that reimbursement of BCM will be based on the patient's diagnosis related group, or DRG, for patients who are covered by Medicare or Medicaid, or through similar reimbursement programs for patients to who are covered by private third-party payors. Within the DRG system, patients are classified by similar diagnoses, which are mapped from the International Statistical Classification of Diseases and Related Health Problems, or ICD, a medical classification list provided by the World Health Organization. The version of ICD that is currently in use with respect to DRG classifications is ICD-9. However, an updated version, ICD-10, has been adopted. We expect that DRG classifications will be required to be mapped against ICD-10 by October 2015 and, as a result, we believe that the DRG classifications will be mapped from ICD-10 rather than ICD-9 at the time we commercialize BCM, if ever, which would result in favorable reimbursement. However, if ICD-9 continues to be used for DRG classification mapping by hospitals or Medicare or Medicaid or other payors, or our expectations with respect to the applicable DRG classification prove incorrect, reimbursement for BCM may prove less favorable or inadequate. In addition, even if ICD-10 is

adopted for reimbursement assessments, the mapping to the DRGs, or the amount reimbursed for the DRGs, may change, all of which could adversely affect the ability of our customers to gain sufficient reimbursement, and therefore, the adoption of, or price we could charge for, BCM.

***If the FDA or comparable non-U.S. regulatory authorities approve generic versions of any of our products that receive marketing approval, or such authorities do not grant our products appropriate periods of data exclusivity before approving generic versions of our products, the sales of our products could be adversely affected.***

Once an NDA is approved, the product covered thereby becomes a "reference listed drug" in the FDA's publication, "Approved Drug Products with Therapeutic Equivalence Evaluations." Manufacturers may seek approval of generic versions of reference listed drugs through submission of abbreviated new drug applications, or ANDAs, in the United States, or through a similar process in foreign jurisdictions. In support of an ANDA, a generic manufacturer need not conduct clinical studies. Rather, the applicant generally must show that its product has the same active ingredient(s), dosage form, strength, route of administration and conditions of use or labeling as the reference listed drug and that the generic version is bioequivalent to the reference listed drug, meaning it is absorbed in the body at the same rate and to the same extent. Generic products may be significantly less costly to bring to market than the reference listed drug and companies that produce generic products are generally able to offer them at lower prices. Thus, following the introduction of a generic drug, a significant percentage of the sales of any branded product or reference listed drug may be typically lost to the generic product.

The FDA may not approve an ANDA for a generic product until any applicable period of non-patent exclusivity for the reference listed drug has expired. Manufacturers may seek to launch these generic products following the expiration of the applicable marketing exclusivity period, even if we still have patent protection for our product.

Competition that our products may face from generic versions of our products could materially and adversely impact our future revenue, profitability and cash flows and substantially limit our ability to obtain a return on the investments we have made in those product candidates.

***Product liability lawsuits against us could divert our resources, cause us to incur substantial liabilities and limit commercialization of any products that we may develop.***

We face an inherent risk of product liability claims as a result of the clinical testing of our product candidates despite obtaining appropriate informed consents from our clinical trial participants. We will face an even greater risk if we commercially sell any product that we may develop. For example, we may be sued if any product we develop allegedly causes injury or is found to be otherwise unsuitable during clinical 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 or a breach of warranties. For example:

- improper use or failure of INOpulse may result in rebound pulmonary hypertension, which can be fatal in some patients;
- rebound pulmonary hypertension may also occur if both the primary and back-up devices fail before we can replace them, if the built-in back-up with a device does not work properly or if the patient does not carry or have access to his or her back-up device; and
- rebound pulmonary hypertension can also occur in patients who were not previously considered at risk for this reaction and who may not have been provided an adequate back-up device.

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. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for products that we may develop;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- significant costs to defend resulting litigation;
- substantial monetary awards to trial participants or patients;
- loss of revenue;
- reduced resources of our management to pursue our business strategy; and
- the inability to commercialize any products that we may develop.

Although we maintain general liability insurance of \$1.0 million in the aggregate, umbrella insurance in the amount of \$10.0 million in the aggregate and clinical trial liability insurance of \$20.0 million in the aggregate, this insurance may not fully cover potential liabilities that we may incur. The cost of any product liability litigation or other proceeding, even if resolved in our favor, could be substantial. We will need to increase our insurance coverage if and when we begin the commercial sale of any product candidate that receives marketing approval. In addition, insurance coverage is becoming increasingly expensive. If we are unable to obtain or maintain sufficient insurance coverage at an acceptable cost or to otherwise protect against potential product liability claims, it could prevent or inhibit the development and commercial production and sale of our product candidates, which could adversely affect our business, financial condition, results of operations and prospects.

***Our INOpulse devices use lithium-ion battery cells, which have been observed to catch fire or vent smoke and flame, and these events may raise concerns about the batteries we use.***

The battery pack used in our INOpulse devices makes use of lithium-ion cells. On rare occasions, lithium-ion cells can rapidly release the energy they contain by venting smoke and flames in a manner that can ignite nearby materials. Highly publicized incidents of laptop computers and cell phones bursting into flames have focused consumer attention on the safety of these cells. There can be no assurance that the battery packs we use would not fail, which could lead to property damage, personal injury or death, and may subject us to lawsuits. We may also have to recall our products, if any, which would be time consuming and expensive. Also, negative perceptions in the healthcare and patient communities regarding the suitability of lithium-ion cells for medical applications or any future incident involving lithium-ion cells could seriously harm our business, even in the absence of an incident involving us.

#### **Risks Related to Our Dependence on Third Parties**

***The intellectual property underlying INOpulse is exclusively licensed from Ikaria. If Ikaria terminates the license agreement, or fails to prosecute, maintain or enforce the underlying patents, our business will be materially harmed.***

We have licensed the intellectual property underlying INOpulse from Ikaria. Despite our best efforts, Ikaria may conclude that we have breached a material term of the license agreement and, as a result, seek to terminate the agreement. In the event the license agreement is terminated, we will lose our ability to market INOpulse, and, upon Ikaria's written request, we will be required to transfer any regulatory approvals that we have obtained for INOpulse to Ikaria.

The license agreement prohibits us from sublicensing to any competitor of Ikaria any intellectual property licensed to us by Ikaria. In addition, we are required to ensure that all of our products, if any,

are used solely for the chronic treatment of PAH, PH-COPD and PH-IPF and to enter into written agreements with any customers that contain restrictions on the use of our products and termination rights in the event such restrictions are violated.

Ikaria has the initial right, but not the obligation, to prosecute and maintain all patents that are licensed to us pursuant to the license agreement. While we have certain step-in rights to assume control if Ikaria declines to file, prosecute or maintain certain licensed patents that are core to our business, in the event Ikaria reasonably determines that our actions could materially impair its business operations or intellectual property rights, Ikaria may prohibit us from taking such actions. In addition, Ikaria has the initial right, but not the obligation, to initiate a legal action against a third party with respect to any actual or suspected infringement of patent rights licensed to us pursuant to the license agreement. We have the right to initiate legal action against a third party infringer of licensed patents that are core to our business in the event Ikaria declines to take action with respect to such infringement, however, if Ikaria determines that our pursuit of any such action could materially impair its business operations or intellectual property rights, Ikaria may prohibit us from taking any such action.

The license agreement terminates, on an INOpulse product-by-INOpulse product basis, at such time as we are no longer actively and continuously engaged in the development or commercialization of such product. In addition, Ikaria may terminate the license agreement if, among other things, (1) we breach or fail to comply with any material term or condition required to be performed or complied with by us and do not cure such breach or failure within 30 days after receiving written notice of such breach from Ikaria, (2) we or any of our affiliates breaches any of our agreements not to compete with Ikaria, (3) we or any of our affiliates challenges the validity or enforceability of the licensed patents or (4) we or any person that is a successor to our license rights markets a generic nitric oxide product that is competitive with Ikaria's INOmax product. Upon termination of the license agreement with respect to any INOpulse product candidate, we will lose our ability to market such INOpulse product candidate, and upon, Ikaria's written request, be required to transfer any and all regulatory approvals relating to such INOpulse product candidate to Ikaria.

***We rely, and expect to continue to rely, on third parties to conduct our clinical trials, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials.***

We currently rely on third-party clinical research organizations, or CROs, to conduct our clinical trials. We expect to continue to rely on third parties, such as CROs, clinical data management organizations, medical institutions and clinical investigators, to conduct our clinical trials. Our agreements with these third parties generally allow the third party to terminate the agreement at any time. If we are required to enter into alternative arrangements because of any such termination, the introduction of our product candidates to market could be delayed.

Our reliance on these third parties for research and development activities will reduce our control over these activities but will not relieve us of our responsibilities. For example, we design our clinical trials and will remain responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the trial. Moreover, the FDA requires us to comply with GCPs for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. Our reliance on third parties that we do not control does not relieve us of these responsibilities and requirements. We also are required to register ongoing clinical trials and post the results of completed clinical trials on a government-sponsored database, ClinicalTrials.gov, within specified timeframes. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions.

Furthermore, these third parties may also have relationships with other entities, some of which may be our competitors. If these third parties do not successfully carry out their contractual duties,

meet expected deadlines or conduct our clinical trials in accordance with regulatory requirements or our stated protocols, we will not be able to obtain, or may be delayed in obtaining, marketing approvals for our product candidates and will not be able to, or may be delayed in our efforts to, successfully commercialize our product candidates.

We also expect to rely on other third parties to store and distribute drug and device supplies for our clinical trials. Any performance failure on the part of our distributors could delay clinical development or marketing approval of our product candidates or commercialization of our products, producing additional losses and depriving us of potential product revenue.

***We rely on Ikaria for our supply of nitric oxide for the clinical trials of INOpulse. Ikaria is the sole supplier of nitric oxide. Ikaria's inability to continue manufacturing adequate supplies of nitric oxide, or its refusal to supply us with commercial quantities of nitric oxide on commercially reasonable terms, or at all, could result in a disruption in the supply of, or impair our ability to market, INOpulse.***

We have entered into a drug clinical supply agreement with Ikaria, pursuant to which Ikaria will manufacture and supply our requirements for nitric oxide for inhalation and corresponding placebo for use in clinical trials of INOpulse. Ikaria manufactures pharmaceutical-grade nitric oxide at its facility in Port Allen, Louisiana, which is the only FDA-inspected site for manufacturing pharmaceutical-grade nitric oxide in the world. Ikaria's Port Allen facility is subject to the risks of a natural disaster or other business disruption. We maintain under controlled storage conditions a two- to three-month supply of clinical trial drug product, but there can be no assurance that we would be able to meet our requirements for INOpulse if there were a catastrophic event or failure of Ikaria's manufacturing system. Because Ikaria's Port Allen facility is the only FDA-inspected site that can manufacture INOpulse and because the manufacture of a pharmaceutical gas requires specialized equipment and expertise, there are few, if any, third-party manufacturers to which we could contract this work in a short period of time. Therefore, any disruption in Ikaria's Port Allen facility, or the failure by Ikaria for any other reason to provide us with nitric oxide, could materially and adversely affect supplies of INOpulse and our ongoing and planned clinical trials. In addition, we do not currently have any arrangements with Ikaria to provide us with commercial quantities of nitric oxide. If we are unable to arrange for Ikaria to provide such quantities on commercially reasonable terms, or at all, we may not be able to successfully produce and market INOpulse or may be delayed in doing so.

We have also entered into a device clinical supply agreement with Ikaria, pursuant to which Ikaria will manufacture and supply our requirements for nitric oxide delivery devices for use in our INOpulse clinical trials. This agreement will expire in February 2015. Ikaria's failure to perform effectively the services that are called for under the device clinical supply agreement could result in a disruption in the supply of, or impair our ability to develop, INOpulse. Furthermore, if we are unable to negotiate a new agreement with Ikaria for the manufacture and supply of such delivery devices following the expiration of the device clinical supply agreement or fail to identify and contract with another third-party manufacturer who can meet such requirements, or fail to do so on commercially reasonable terms, our clinical trials and ability to commercialize our product candidates could be materially and adversely affected.

***We rely on third-party suppliers and manufacturers to produce and deliver clinical drug supplies for our BCM product candidate and may also do so for other product candidates. Any failure by a third-party supplier or manufacturer to produce or deliver supplies for us may delay or impair our ability to complete our clinical trials.***

We currently rely, and expect to continue to rely, on third parties for supply of the ingredients for our BCM product candidate. These suppliers are, and any future third-party suppliers with whom we enter into agreements may be, our sole suppliers of BCM or any of our other current or future product candidates. These suppliers are commonly referred to as single-source suppliers. If our suppliers fail to deliver materials and provide services needed for the production of BCM or our other product

candidates in a timely and sufficient manner, if they fail to comply with applicable regulations, or if we do not qualify alternate suppliers, clinical development or regulatory approval of our product candidates or commercialization of our products could be delayed, increasing our costs to complete clinical development and to obtain regulatory approval, which could deprive us of potential additional product revenue.

In addition, we currently outsource the manufacture of BCM for use in clinical trials pursuant to the terms of a manufacturing and supply agreement with a third-party which expires in April 2017. We plan to enter into a manufacturing and supply agreement for BCM with a new third-party manufacturer prior to April 2017. If we fail to enter into a new manufacturing and supply agreement for BCM with a third-party prior to the expiration of our existing manufacturing and supply agreement or if such new agreement is on less favorable terms, our ability to complete our clinical trials for BCM may be impaired.

Reliance on third-party manufacturers entails risks to which we would not be subject if we manufactured product candidates ourselves, including reliance on the third party for regulatory compliance and quality assurance, the possibility of breach of the manufacturing agreement by the third party because of factors beyond our control (including a failure to synthesize and manufacture our product candidates in accordance with our product specifications) and the possibility of termination or nonrenewal of the agreement by the third party, based on its own business priorities, at a time that is costly or damaging to us. In addition, the FDA and other regulatory authorities require that our product candidates be manufactured according to current Good Manufacturing Practices, or cGMP, and similar foreign standards. Any failure by our third-party manufacturers to comply with cGMP or failure to scale up manufacturing processes, including any failure to deliver sufficient quantities of product candidates in a timely manner, could lead to a delay in, or failure to obtain, regulatory approval of any of our product candidates. In addition, such failure could be the basis for action by the FDA or other regulatory authorities to withdraw approvals for product candidates previously granted to us and for other regulatory action, including recall or seizure, fines, imposition of operating restrictions, total or partial suspension of production or injunctions.

We rely on our manufacturers to purchase the materials necessary to produce our product candidates for our clinical trials from third-party suppliers. There are a small number of suppliers for certain capital equipment and raw materials that are used to manufacture our product candidates. Such suppliers may not sell these raw materials to our manufacturers at the times we need them or on commercially reasonable terms. We do not have any control over the process or timing of the acquisition of these raw materials by our manufacturers. Any significant delay in the supply of a product candidate or the raw material components thereof for an ongoing clinical trial due to the need to replace a third-party manufacturer could considerably delay completion or increase the costs of our clinical trials, product testing and potential regulatory approval of our product candidates. If our manufacturers or we are unable to purchase these raw materials after regulatory approval has been obtained for our product candidates, the commercial launch of our product candidates would be delayed or there would be a shortage in supply, which would impair our ability to generate revenues from the sale of our product candidates.

***We intend to rely on third parties to produce commercial supplies of any approved product candidates. Any failure by a third-party supplier or manufacturer to produce or deliver supplies for us may delay or impair our ability to commercialize our product candidates.***

To date, our product candidates have been manufactured in small quantities for pre-clinical studies and clinical trials. If one or more of our product candidates are approved by the FDA or comparable regulatory authorities in other countries for commercial sale, we will need to manufacture such product candidate in larger quantities. We do not currently have any arrangements with Ikaria or another third-party manufacturer to provide commercial quantities of our product candidates. If we are unable to arrange for such a third-party manufacturing source, or fail to do so on commercially reasonable terms,

we may not be able to successfully produce and market our product candidates or may be delayed in doing so.

If we successfully commercialize any of our product candidates, we may be required to establish or access large-scale commercial manufacturing capabilities. We do not own or operate manufacturing facilities for the production of clinical or commercial quantities of our product candidates, and we currently have no plans to build our own clinical or commercial scale manufacturing capabilities.

***Our BCM product candidate currently in development is exclusively licensed from BioLineRx Ltd., and we may enter into additional agreements to in-license technology from third parties. If BioLineRx Ltd. or other future licensors terminate the applicable license, or fail to maintain or enforce the underlying patents, our competitive position and market share will be harmed.***

We have an exclusive worldwide license for our BCM product candidate, subject to certain retained rights of the licensor, from BioLineRx Ltd. and its subsidiary, who we collectively refer to as BioLine. Under the terms of the license agreement, we are obligated to use commercially reasonable efforts to develop and commercialize at least one product containing BCM. BioLine has the right to terminate its license agreement with us for an uncured material breach by us, upon which our exclusive license for BCM will terminate. We have recently been engaged in discussions with BioLine relating to our performance under the license agreement. BioLine has indicated to us that it believes that we have breached the license agreement in several ways, including, but not limited to, failure to use commercially reasonable efforts to develop BCM, failure to provide BioLine with material information concerning the development and commercialization plans for BCM and failure to notify BioLine in advance of material public disclosures regarding BCM. We and BioLine also disagree about the timing of a \$12.5 million milestone payment that we would owe BioLine based upon progress in our BCM clinical development program. If we are unable to reach agreement with BioLine on these issues, BioLine could bring a lawsuit against us or seek to terminate the license agreement. Although we believe that we would have strong defenses in any litigation that could be brought by BioLine, if BioLine were to prevail in any such litigation, one of the potential remedies would be the termination of the license agreement and our consequent loss of rights to BCM. In addition, if BioLine were to prevail in any such litigation, or if we were required to pay the milestone in dispute sooner than we had planned, or if we were required to return BCM to BioLine, these events could have a material adverse effect on our business, results of operations, financial condition and/or liquidity.

We have also exclusively licensed INOpulse, for certain indications and settings, and subject to certain retained rights of the licensor, from Ikaria. See "Certain Relationships and Related Person Transactions—Relationship with Ikaria" for a summary of our exclusive cross-license, technology transfer and regulatory matters agreement with Ikaria.

We may enter into additional license agreements as part of the development of our business in the future. Such licensors, if any, may be responsible for prosecution of certain patent applications and maintenance of certain patents. Such licensors may not successfully prosecute such patent applications or maintain such patents, which we have licensed and on which our business depends. Our licensors may fail to pursue litigation against third-party infringers, may fail to prove infringement, or may fail to defend against counterclaims of patent invalidity or unenforceability. If these in-licenses are terminated, or if the underlying patents fail to provide the intended market exclusivity, competitors would have the freedom to seek regulatory approval of, and to market, products identical to ours. This could have a material adverse effect on our competitive business position and our business prospects.

***We may have received better terms from unaffiliated third parties than the terms we received in our agreements with Ikaria.***

The agreements related to the Spin-Out, including the separation and distribution agreement, TSA, license agreement, drug clinical supply agreement, device clinical supply agreement, agreements not to

compete and the other agreements, were negotiated in the context of our separation from Ikaria while we were still part of Ikaria and, accordingly, may not reflect terms that would have resulted from arm's-length negotiations among unaffiliated third parties. The terms of the agreements we negotiated in the context of our separation related to, among other things, allocation of assets, liabilities, rights, indemnifications and other obligations among Ikaria and us. We may have received better terms from third parties because third parties may have competed with each other to win our business. Some of our board members are also members of the Ikaria board. See "Certain Relationships and Related Person Transactions—Relationship with Ikaria."

***Third parties may seek to hold us responsible for liabilities of Ikaria that we did not assume in our agreements.***

In connection with our separation from Ikaria, Ikaria has generally agreed to retain all liabilities that did not historically arise from our business. Third parties may seek to hold us responsible for Ikaria's retained liabilities. Under our agreements with Ikaria, Ikaria has agreed to indemnify us for claims and losses relating to these retained liabilities. However, if those liabilities are significant and we are ultimately liable for them, we cannot assure you that we will be able to recover the full amount of our losses from Ikaria.

***Any disputes that arise between us and Ikaria with respect to our past and ongoing relationships could harm our business operations.***

Disputes may arise between Ikaria and us in a number of areas relating to our past and ongoing relationships, including:

- intellectual property, technology and business matters, including failure to make required technology transfers and failure to comply with non-compete provisions applicable to Ikaria and us;
- labor, tax, employee benefit, indemnification and other matters arising from our separation from Ikaria;
- distribution and supply obligations;
- employee retention and recruiting;
- business combinations involving us;
- the nature, quality and pricing of transitional services Ikaria has agreed to provide us; and
- business opportunities that may be attractive to both Ikaria and us.

We may not be able to resolve any potential conflicts, and even if we do, the resolution may be less favorable than if we were dealing with an unaffiliated party.

***We may seek to enter into collaborations with third parties for the development and commercialization of our product candidates. If we fail to enter into such collaborations, or such collaborations are not successful, we may not be able to capitalize on the market potential of our product candidates.***

We may seek third-party collaborators for development and commercialization of our product candidates. Our likely collaborators for any marketing, distribution, development, licensing or broader collaboration arrangements include large and mid-size pharmaceutical and medical device companies, regional and national biotechnology companies and pharmaceutical companies. We are not currently party to any such arrangement. However, if we do enter into any such arrangements with any third parties in the future, we will likely have limited control over the amount and timing of resources that our collaborators dedicate to the development or commercialization of our product candidates. Our

ability to generate revenues from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements.

Collaborations involving our product candidates would pose the following risks to us:

- collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not pursue development and commercialization of our product candidates or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in the collaborators' strategic focus or available funding, or external factors such as an acquisition that diverts resources or creates competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing;
- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our products or product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours;
- collaborators with marketing and distribution rights to one or more of our products may not commit sufficient resources to the marketing and distribution of such product or products;
- collaborators may not properly maintain or defend our intellectual property rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential litigation;
- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability;
- disputes may arise between the collaborators and us that result in the delay or termination of the research, development or commercialization of our products or product candidates or that result in costly litigation or arbitration that diverts management attention and resources; and
- collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates.

Collaboration agreements may not lead to development or commercialization of product candidates in the most efficient manner or at all. If a collaborator of ours were to be involved in a business combination, the continued pursuit and emphasis on our product development or commercialization program could be delayed, diminished or terminated.

***If we are not able to establish collaborations, we may have to alter our development and commercialization plans.***

Our drug and device development programs and the potential commercialization of our product candidates will require substantial additional cash to fund expenses. For some of our product candidates, we may decide to collaborate with biotechnology and pharmaceutical companies for the development and potential commercialization of those product candidates.

We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. Those factors may include the design or results of clinical trials, the likelihood of approval by the FDA or similar regulatory authorities outside

the United States, the potential market for the subject product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge and industry and market conditions generally. The collaborator may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us for our product candidate. The terms of our current or future license agreements may restrict our ability to enter into agreements on certain terms with future collaborators. For example, our license agreement with Ikaria prohibits us from granting a sublicense under any of the intellectual property licensed to us under such license agreement to any of our affiliates or any third party, in each case, that directly or indirectly competes with the Ikaria nitric oxide business, and any future license agreements may contain similar restrictions. Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators.

We may not be able to negotiate collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of a product candidate, reduce or delay its development program or one or more of our other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop our product candidates or bring them to market and generate product revenue.

## **Risks Related to Our Intellectual Property**

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

Our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to our proprietary technology and products. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our novel technologies and product candidates. The patents we have licensed from Ikaria relating to INOpulse expire as late as 2027 in the United States and as late as 2026 in certain other countries and the patents we have licensed from BioLine relating to our BCM product candidate expire as late as 2029 in the United States, with a possible patent term extension to 2032 to 2034, and 2024 in certain other countries.

The patent prosecution process is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. Moreover, pursuant to our license agreement with Ikaria, we do not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, covering the INOpulse technology that we license from Ikaria, except in the event that Ikaria declines to prosecute or maintain certain licensed patents that are core to our business, elects to allow any of such patents to lapse or elects to abandon any such patents, in which case we would have step-in rights to assume control of the prosecution and/or maintenance of such patents, subject to Ikaria's right to prohibit us from taking such actions if it reasonably determines that such actions could materially impair its business, operations or intellectual property rights. Similarly, under the terms of any future agreements that we may enter into with other third parties, we



may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, covering the technology that is licensed to us under such agreements. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business.

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

Recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our owned or licensed issued patents. On September 16, 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to U.S. patent law. The Leahy-Smith Act includes provisions that affect the way patent applications are prosecuted and affect patent litigation. The U.S. Patent and Trademark Office, or USPTO, recently developed new regulations and procedures to govern administration of the Leahy-Smith Act. Many of the substantive changes to patent law associated with the Leahy-Smith Act, and in particular, the first to file provisions, became effective on March 16, 2013. Accordingly, it is not clear what, if any, impact the Leahy-Smith Act will have on the operation of our business. However, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our owned or licensed patent applications and the enforcement or defense of our owned or licensed issued patents, all of which could have a material adverse effect on our business and financial condition.

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

Even if our owned and licensed patent applications issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors from competing with us, or otherwise provide us with any competitive advantage. Our competitors may be able to circumvent our owned or licensed patents by developing similar or alternative technologies or products in a non-infringing manner. We may not receive patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Act, that we expect or our rights during the extension period may be more limited than the full scope of the patent, making it easier for our competitors to develop and market non-infringing technologies or products.

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

***We may become involved in lawsuits to protect or enforce our patents or other intellectual property, which could be expensive, time consuming and unsuccessful.***

Competitors may infringe our owned or licensed patents or other intellectual property. To counter infringement or unauthorized use, we may be required to file or participate in infringement claims, which can be expensive and time consuming. Any claims we or our licensors assert against perceived infringers could provoke these parties to assert counterclaims against us alleging that we infringe their patents. In addition, in a patent infringement proceeding, a court may decide that a patent of ours or our licensor is invalid or unenforceable, in whole or in part, construe the patent's claims narrowly or refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation proceeding could put one or more of our owned or licensed patents at risk of being invalidated or interpreted narrowly.

Under the terms of our license agreement with Ikaria, in the event a third party is suspected of infringing any patent rights licensed to us by Ikaria, Ikaria has the initial right, but not the obligation, to initiate a legal action against such third party. In the event that Ikaria declines to take any action with respect to an alleged infringement of certain licensed patents that are core to our business, we have the right, in certain circumstances, to initiate a legal action against such third party, provided that, if Ikaria reasonably determines that our pursuit of any action with respect to infringement of any of such core patents could materially impair Ikaria's business operations or intellectual property rights, Ikaria may require us to not undertake or to cease any such action. Our inability to initiate a legal action against a third party suspected of infringing intellectual property rights important to our business may have a material adverse effect on our competitive business position and our business prospects.

***If we fail to comply with our obligations under license agreements, we could lose rights that are important to our business. BioLine has raised concerns with respect to our performance under the terms of our license agreement and may bring suit against us.***

We are party to a license agreement with BioLine relating to our BCM product candidate that imposes, and we may enter into additional license agreements that may impose, various diligence, milestone payment, royalty and other obligations on us. Under our existing license agreement with BioLine, we are obligated to pay royalties on the net sales of product candidates or related technologies to the extent they are covered by the agreement. We also have diligence and development obligations under this agreement. Moreover, under our license agreement with Ikaria, we have granted Ikaria a sole and exclusive worldwide license to any intellectual property rights that we control for use in Ikaria's nitric oxide business, are required to ensure that all of our products, if any, are used solely for the chronic treatment of PAH, PH-COPD and PH-IPF and to enter into written agreements with any customers that contain restrictions on the use of our products and termination rights in the event such restrictions are violated, and have agreed to pay 100% of the reasonable and documented costs incurred by Ikaria for the prosecution and maintenance of certain licensed patents that are core to our business and 10% of such costs incurred by Ikaria for all other licensed patents. If we fail to comply

with our obligations under current or future license agreements, our counterparties may have the right to terminate these agreements, in which event we might not be able to develop, manufacture or market any product that is covered by the agreement or face other penalties under the agreement. Such an occurrence could materially adversely affect the value of the product candidate being developed under any such agreement.

We have recently been engaged in discussions with BioLine relating to our performance under the license agreement. BioLine has indicated to us that it believes that we have breached the license agreement in several ways, including, but not limited to, failure to use commercially reasonable efforts to develop BCM, failure to provide BioLine with material information concerning the development and commercialization plans for BCM and failure to notify BioLine in advance of material public disclosures regarding BCM. We and BioLine also disagree about the timing of a \$12.5 million milestone payment that we would owe BioLine based upon progress in our BCM clinical development program. If we are unable to reach agreement with BioLine on these issues, BioLine could bring a lawsuit against us or seek to terminate the license agreement. Although we believe that we would have strong defenses in any litigation that could be brought by BioLine, if BioLine were to prevail in any such litigation, one of the potential remedies would be the termination of the license agreement and our consequent loss of rights to BCM. In addition, if BioLine were to prevail in any such litigation, or if we were required to pay the milestone in dispute sooner than we had planned, or if we were required to return BCM to BioLine, these events could have a material adverse effect on our business, results of operations, financial condition and/or liquidity. Termination of our license agreement with BioLine, or any future license agreements we may enter into, or reduction or elimination of our rights under such agreements may result in our having to negotiate new or reinstated agreements with less favorable terms, or cause us to lose our rights under these agreements, including our rights to important intellectual property or technology.

***Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain and could have a material adverse effect on the success of our business.***

Our commercial success depends upon our ability to develop, manufacture, market and sell our product candidates and use our proprietary technologies without infringing the proprietary rights of third parties. There is considerable intellectual property litigation in the pharmaceutical, biotechnology and medical device industries. We may become party to, or be threatened with, future adversarial proceedings or litigation regarding intellectual property rights with respect to our products and technology, including interference or derivation proceedings before the USPTO. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future.

If we are found to infringe a third party's intellectual property rights, we could be required to obtain a license from such third party to continue developing and marketing our products and technology. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. We could be forced, including by court order, to cease commercializing the infringing technology or product. In addition, we could be found liable for monetary damages, including treble damages and attorneys' fees if we are found to have willfully infringed a patent. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

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

Many of our employees were previously employed at other pharmaceutical, biotechnology or medical device companies, including our competitors or potential competitors. Although we try to ensure that our employees do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or these employees have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such employee's former employer. Litigation may be necessary to defend against these claims.

In addition, while it is our policy to require our employees and contractors who may be involved in the development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in timely obtaining such an agreement with each party who in fact develops intellectual property that we regard as our own. Even if timely obtained, such agreements may be breached, and we may be forced to bring claims against third parties, or defend claims they may bring against us, to determine the ownership of what we regard as our intellectual property.

If we fail in prosecuting or defending any such claims, we may lose valuable intellectual property rights or personnel, in addition to paying monetary damages. Even if we are successful in prosecuting or defending against such claims, litigation could result in substantial costs and be a distraction to management.

***Intellectual property litigation could cause us to spend substantial resources and distract our personnel from their normal responsibilities.***

Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses, and could distract our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments, and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to conduct such litigation or proceedings adequately. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could compromise our ability to compete in the marketplace.

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

In addition to seeking patents for some of our technology and product candidates, we also rely on trade secrets, including unpatented know-how, technology and other proprietary information, to maintain our competitive position. We seek to protect these trade secrets, in part, by entering into non-disclosure and confidentiality agreements with parties who have access to them, such as our employees, outside scientific collaborators, contract manufacturers, consultants, advisors and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants. Despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. Even if we are successful in prosecuting such claims, any remedy awarded may be insufficient to fully compensate us for the improper disclosure or misappropriation. In addition, some

courts inside and outside the United States are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, our competitive position would be harmed.

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

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

- Others may be able to develop and commercialize treatments that are similar to our product candidates but that are not covered by the claims of the patents that we own or have exclusively licensed.
- We or our licensors might not have been the first to make the inventions covered by the issued patent or pending patent application that we own or have exclusively licensed.
- We or our licensors might not have been the first to file patent applications covering certain of our inventions.
- Others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights.
- It is possible that our pending patent applications will not lead to issued patents.
- Issued patents that we own or have exclusively licensed may not provide us with any competitive advantages, or may be held invalid or unenforceable, as a result of legal challenges by our competitors.
- Our competitors 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 have an adverse effect on our business.
- Another party may be granted orphan exclusivity for an indication that we are seeking before us or may be granted orphan exclusivity for one of our products for another indication.

**Risks Related to Regulatory Approval of Our Product Candidates and Other Legal Compliance Matters**

***Even if we complete the necessary clinical trials, the marketing approval process is expensive, time consuming and uncertain and may prevent us from obtaining approvals for the commercialization of some or all of our product candidates. If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals, we will not be able to commercialize our product candidates, and our ability to generate revenue will be materially impaired.***

Our product candidates and the activities associated with their development and commercialization, including their design, testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale and distribution, are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and by the EMA and similar regulatory authorities outside the United States. Failure to obtain marketing approval for a product candidate will prevent us from commercializing the product candidate. Our product candidates are in the early stages of development and are subject to the risks of failure inherent in drug and device development. We have not received approval

to market any of our product candidates from regulatory authorities in any jurisdiction. We have only limited experience in conducting and managing the clinical trials, and in filing and supporting the applications necessary to gain marketing approvals and expect to rely on third-party CROs to assist us in this process. Securing marketing approval requires the submission of extensive pre-clinical and clinical data and supporting information to regulatory authorities for each therapeutic indication to establish the product candidate's safety and efficacy. Securing marketing approval also requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the regulatory authorities. Our product candidates may not be effective, may be only moderately effective or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may preclude our obtaining marketing approval or prevent or limit commercial use.

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

***Our failure to obtain marketing approval in foreign jurisdictions would prevent our product candidates from being marketed abroad, and any approval we are granted for our product candidates in the United States would not assure approval of product candidates in foreign jurisdictions.***

In order to market and sell our products in the European Union and many other jurisdictions, we must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ substantially from that required to obtain FDA approval. The regulatory approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. In addition, in many countries outside the United States, it is required that the product be approved for reimbursement before the product can be approved for sale in that country. We may not obtain approvals from regulatory authorities outside the United States on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the United States does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA. We may not be able to file for marketing approvals and may not receive necessary approvals to commercialize our products in any market.

***Even if we obtain marketing approval for our product candidates, the terms of approvals and ongoing regulation of our products may limit how we manufacture and market our products and compliance with such requirements may involve substantial resources, which could materially impair our ability to generate revenue.***

Even if marketing approval of a product candidate is granted, an approved product and its manufacturer and marketer are subject to ongoing review and extensive regulation, including the requirement to implement a risk evaluation and mitigation strategy or to conduct costly post-marketing studies or clinical trials and surveillance to monitor the safety or efficacy of the product. We must also

comply with requirements concerning advertising and promotion for any of our product candidates for which we obtain marketing approval. Promotional communications with respect to prescription drugs are subject to a variety of legal and regulatory restrictions and must be consistent with the information in the product's approved labeling. Thus, we will not be able to promote any products we develop for indications or uses for which they are not approved. In addition, manufacturers of approved products and those manufacturers' facilities are required to ensure that quality control and manufacturing procedures conform to cGMP, which include requirements relating to quality control and quality assurance as well as the corresponding maintenance of records and documentation and reporting requirements. We and our contract manufacturers could be subject to periodic unannounced inspections by the FDA and other regulatory authorities to monitor and ensure compliance with cGMP.

Accordingly, assuming we receive marketing approval for one or more of our product candidates, we and our contract manufacturers will continue to expend time, money and effort in all areas of regulatory compliance, including manufacturing, production, product surveillance and quality control. If we are not able to comply with post-approval regulatory requirements, we could have the marketing approvals for our products withdrawn by regulatory authorities and our ability to market any future products could be limited, which could adversely affect our ability to achieve or sustain profitability. Thus, the cost of compliance with post-approval regulations may have a negative effect on our operating results and financial condition.

***Any product candidate for which we obtain marketing approval will be subject to strict enforcement of post-marketing requirements and we could be subject to substantial penalties, including withdrawal of our product from the market, if we fail to comply with all regulatory requirements or if we experience unanticipated problems with our products, when and if any of them are approved.***

Any product candidate for which we obtain marketing approval, along with the manufacturing processes, post-approval clinical data, labeling, advertising and promotional activities for such product, will be subject to continual requirements of and review by the FDA and other regulatory authorities. These requirements include, but are not limited to, restrictions governing promotion of an approved product, submissions of safety and other post-marketing information and reports, registration and listing requirements, cGMP requirements relating to manufacturing, quality control, quality assurance and corresponding maintenance of records and documents, and requirements regarding the distribution of samples to physicians and recordkeeping.

The FDA and other federal and state agencies, including the Department of Justice, closely regulate compliance with all requirements governing prescription drug and device products, including requirements pertaining to marketing and promotion of drugs and devices in accordance with the provisions of the approved labeling and manufacturing of products in accordance with cGMP requirements. Violations of such requirements may lead to investigations alleging violations of the Food, Drug, and Cosmetic Act and other statutes, including the False Claims Act and other federal and state health care fraud and abuse laws as well as state consumer protection laws. Our failure to comply with all regulatory requirements, and later discovery of previously unknown adverse events or other problems with our products, manufacturers or manufacturing processes, may yield various results, including:

- litigation involving patients taking our products;
- restrictions on such products, manufacturers or manufacturing processes;
- restrictions on the labeling or marketing of a product;
- restrictions on product distribution or use;
- requirements to conduct post-marketing studies or clinical trials;

- untitled or warning letters;
- withdrawal of the products from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- recall of products;
- fines, restitution or disgorgement of profits or revenues;
- suspension or withdrawal of marketing approvals;
- damage to relationships with any potential collaborators;
- unfavorable press coverage and damage to our reputation;
- refusal to permit the import or export of our products;
- product seizure; or
- injunctions or the imposition of civil or criminal penalties.

Non-compliance by us or any future collaborator with regulatory requirements regarding safety monitoring or pharmacovigilance, and with requirements related to the development of products for the pediatric population, can also result in significant financial penalties. Similarly, failure to comply with regulatory requirements regarding the protection of personal information can also lead to significant penalties and sanctions.

***Our relationships with customers and third-party payors will be subject to applicable anti-kickback, fraud and abuse and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm and diminished profits and future earnings.***

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

- the federal Anti-Kickback Statute prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under a federal healthcare program such as Medicare and Medicaid;
- the federal False Claims Act imposes criminal and civil penalties, including civil whistleblower or qui tam actions, against individuals or entities for, among other things, knowingly presenting, or causing to be presented false or fraudulent claims for payment by a federal government program, or making a false statement or record material to payment of a false claim or avoiding, decreasing or concealing an obligation to pay money to the federal government;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program and also imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;



- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act and its implementing regulations, also imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;
- the federal false statements statute prohibits knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement in connection with the delivery of or payment for healthcare benefits, items or services;
- the federal transparency requirements under the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively the PPACA, requires applicable manufacturers of covered drugs, devices, biologics and medical supplies to report to the Department of Health and Human Services information related to payments and other transfers of value to physicians and teaching hospitals and physician ownership and investment interests; and
- analogous state laws and regulations such as state anti-kickback and false claims laws and analogous non-U.S. fraud and abuse laws and regulations, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, and some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug manufacturers to report information related to payments to physicians and other health care providers or marketing expenditures. Some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government and may require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures. State and non-U.S. laws also govern the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion of products from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

***Laws and regulations governing any international operations we may have in the future may preclude us from developing, manufacturing and selling certain product candidates and products outside of the United States and require us to develop and implement costly compliance programs.***

If we expand our operations outside of the United States, we must dedicate additional resources to comply with numerous laws and regulations in each jurisdiction in which we plan to operate. The Foreign Corrupt Practices Act, or the FCPA, prohibits any U.S. individual or business from paying, offering, authorizing payment or offering anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of such third party in

order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with certain accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the company, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations.

Compliance with the FCPA is expensive and difficult, particularly in countries in which corruption is a recognized problem. In addition, the FCPA presents particular challenges in the medical device industry, because, in many countries, hospitals are operated by the government, and doctors and other hospital employees are considered foreign officials. Certain payments to hospitals in connection with clinical trials and other work have been deemed to be improper payments to government officials and have led to FCPA enforcement actions.

Various laws, regulations and executive orders also restrict the use and dissemination outside of the United States, or the sharing with certain non-U.S. nationals, of information classified for national security purposes, as well as certain products and technical data relating to those products. If we expand our presence outside of the United States, it will require us to dedicate additional resources to comply with these laws, and these laws may preclude us from developing, manufacturing or selling certain product candidates and products outside of the United States, which could limit our growth potential and increase our development costs.

The failure to comply with laws governing international business practices may result in substantial civil and criminal penalties and suspension or debarment from government contracting. The Securities and Exchange Commission also may suspend or bar issuers from trading securities on U.S. exchanges for violations of the FCPA's accounting provisions.

***If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could harm our business.***

Currently, we do not operate any research and development or production facilities, including laboratory, development or manufacturing facilities. However, if we decided to operate our own research and development and production facilities, we would be subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Such operations may involve the use of hazardous and flammable materials, including chemicals and biological materials. Our operations may also produce hazardous waste products. Even if we contract with third parties for the disposal of these materials and wastes, we would not be able to eliminate the risk of contamination or injury from these materials. In the event of contamination or injury resulting from our use or disposal of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties for failure to comply with such laws and regulations.

Although we would increase our level of workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not expect to maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our possible future storage or disposal of biological, 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. These current or future laws and regulations may impair our research, development or production efforts. Our failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

## **Risks Related to Employee Matters and Managing Growth**

### ***Our future success depends on our ability to retain key executives and to attract, retain and motivate qualified personnel.***

We are dependent on the scientific, business development and clinical expertise of our management team, including Jonathan Peacock, our chief executive officer, Manesh Naidu, our chief business officer, Reinilde Heyrman, our chief clinical development officer, and Martin Meglasson, our chief scientific officer. We recently hired our chief executive officer. Leadership transitions can be inherently difficult to manage and may cause some disruptions in our business.

Recruiting and retaining qualified scientific, clinical, manufacturing and sales and marketing personnel will also be critical to our success. Any of our employees may terminate their employment with us at any time. The loss of the services of our executive officers or other key employees could impede the achievement of our research, development and commercialization objectives and seriously harm our ability to successfully implement our business strategy. We do not maintain "key person" insurance for any of our executives or other employees. Furthermore, replacing executive officers and key employees may be difficult and may take an extended period of time because of the limited number of individuals in our industry with the breadth of skills and experience required to successfully develop, gain regulatory approval of and commercialize products. Competition to hire from this limited pool is intense, and we may be unable to hire, train, retain or motivate these key personnel on acceptable terms given the competition among numerous pharmaceutical, biotechnology and medical device companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us.

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

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include intentional failures to comply with FDA regulations, to provide accurate information to the FDA, to comply with federal and state healthcare fraud and abuse laws and regulations, to report financial information or data accurately, to disclose unauthorized activities to us or to comply with our Code of Business Conduct and Ethics. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, false claims, inappropriate promotion, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. The precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of significant fines or other sanctions.

In addition, during the course of our operations, our directors, executives and employees may have access to material, non-public information regarding our business, our results of operations or potential transactions we are considering. We may not be able to prevent a director, executive or employee from violating our insider trading policies and trading in our common stock on the basis of, or while having

access to, material, non-public information. If a director, executive or employee was to be investigated, or an action was to be brought against a director, executive or employee for insider trading, it could have a negative impact on our reputation and our stock price. Such a claim, with or without merit, could also result in substantial expenditures of time and money, and divert attention of our management team from other tasks important to the success of our business.

***We expect to expand our development and regulatory capabilities and potentially implement sales, marketing and distribution capabilities, and as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.***

As of September 30, 2014, we had 47 full-time employees, of which 41 employees were engaged in research and development. We expect to experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of development, regulatory affairs and, if any of our product candidates receives marketing approval, sales, marketing and distribution. To manage our anticipated future growth, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such anticipated growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. The expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

#### **Risks Related to This Offering and Ownership of Our Common Stock**

***Our principal stockholders will continue to have substantial control over us after this offering, which could limit your ability to influence the outcome of key transactions, including any change of control.***

Upon the completion of this offering, we anticipate that our largest stockholder, investment funds affiliated with New Mountain Capital, or the New Mountain Entities, will own, in the aggregate, approximately % of our outstanding common stock ( % if the underwriters exercise their option to purchase additional shares in full). In addition, we expect that the New Mountain Entities, together with Linde North America, Inc., an indirect wholly-owned subsidiary of Linde AG, or Linde, and investment funds affiliated with ARCH Ventures, Venrock and 5AM Ventures, which we sometimes refer to collectively as our principal stockholders, will own, in the aggregate, approximately % of our outstanding shares of common stock ( % if the underwriters exercise their option to purchase additional shares in full). Following the completion of this offering, pursuant to the terms of a stockholders agreement, the New Mountain Entities will be entitled to nominate one director to our board of directors and to the board of directors (or equivalent governing body) of each of our subsidiaries and to appoint the lead non-employee director of our board of directors, in each case, for so long as the New Mountain Entities and their respective assignees beneficially own (i) 50% or more of the sum of (a) the aggregate number of shares of our common stock that they collectively own immediately prior to the closing of this offering and (b) the number of shares of our common stock, if any, acquired following the closing of this offering and (ii) at least 15% or more of our common stock outstanding (as set forth on the cover of our then most recently filed annual report on Form 10-K or quarterly report on Form 10-Q). See "Certain Relationships and Related Person Transactions—Stockholders Agreement."

The New Mountain Entities will also have certain other rights conferred by the stockholders agreement. See "Certain Relationships and Related Person Transactions—Stockholders Agreement." The New Mountain Entities will be able to exert significant influence over matters requiring board approval. In addition, their consent will be required for certain matters requiring approval by our stockholders, including the compensation and hiring and firing of our chief executive officer, business

combinations, issuance of shares of our capital stock and incurrence of debt. These stockholder approval rights will terminate when the New Mountain Entities and their respective assignees beneficially own either (i) less than 50% of the sum of (a) the number of shares of our common stock that they collectively own immediately prior to the closing of this offering and (b) the number of shares of our common stock, if any, acquired following the closing of this offering or (ii) less than 15% of our common stock outstanding (as set forth on the cover of our then most recently filed annual report on Form 10-K or quarterly report on Form 10-Q).

The New Mountain Entities may have interests that differ from your interests, and they may vote in a way with which you disagree and that may be adverse to your interests. The concentration of ownership of our capital stock may have the effect of delaying, preventing or deterring a change of control of our company, could deprive our stockholders of an opportunity to receive a premium for their common stock as part of a sale of our company and may adversely affect the market price of our common stock.

***We do not know whether a market will develop for our common stock or what the market price of our common stock will be and as a result it may be difficult for you to sell your shares of our common stock.***

Before this offering, there was no public trading market for our common stock. If a market for our common stock does not develop or is not sustained, it may be difficult for you to sell your shares of common stock at an attractive price or at all. We cannot predict the prices at which our common stock will trade. It is possible that in one or more future periods our results of operations may be below the expectations of public market analysts and investors and, as a result of these and other factors, the price of our common stock may fall.

***The market price of our common stock may be volatile, which could result in substantial losses for investors purchasing shares in this offering.***

The initial public offering price for our common stock will be determined through negotiations with the underwriters. This initial public offering price may vary from the market price of our common stock after the offering. Some of the factors that may cause the market price of our common stock to fluctuate include:

- actual or anticipated results from and any delays in our clinical trials, including our expected and ongoing clinical trials of our INOpulse and BCM product candidates, as well as results of regulatory input on our clinical trial programs and regulatory reviews relating to the approval of our product candidates;
- the results of our efforts to discover, develop, acquire or in-license additional product candidates or products;
- failure or discontinuation of any of our clinical development programs;
- the level of expenses related to any of our product candidates or clinical development programs;
- commencement or termination of any collaboration or licensing arrangement;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures and capital commitments;
- additions or departures of key scientific or management personnel;
- variations in our financial results or those of companies that are perceived to be similar to us;

- new products, product candidates or new uses for existing products introduced or announced by our competitors, and the timing of these introductions or announcements;
- results of clinical trials of product candidates of our competitors;
- general economic and market conditions and other factors that may be unrelated to our operating performance or the operating performance of our competitors, including changes in market valuations of similar companies;
- regulatory or legal developments in the United States and other countries;
- changes in the structure of healthcare payment systems;
- conditions or trends in the pharmaceutical, biotechnology and medical device industries;
- actual or anticipated changes in earnings estimates, development timelines or recommendations by securities analysts;
- announcement or expectation of additional financing efforts;
- sales of common stock by us or our stockholders in the future, as well as the overall trading volume of our common stock; and
- the other factors described in this "Risk Factors" section.

In addition, the stock market in general and the market for pharmaceutical, biotechnology and medical device companies in particular have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of those companies. These broad market and industry factors may seriously harm the market price of our common stock, regardless of our operating performance. In the past, following periods of volatility in companies' stock prices, securities class-action litigation has often been instituted against such companies. Such litigation, if instituted against us, could result in substantial costs and diversion of management's attention and resources, which could materially and adversely affect our business and financial condition.

***A significant portion of our total outstanding shares may be sold into the public market in the near future, which could cause the market price of our common stock to drop significantly, even if our business is doing well.***

Sales of a substantial number of shares of our common stock in the public market, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. After this offering, we will have outstanding                shares of common stock based on the number of shares outstanding as of September 30, 2014, assuming no exercise by the underwriters of their option to purchase additional shares. This includes the                shares that we are selling in this offering, which may be resold in the public market immediately without restriction, unless purchased by our affiliates or existing stockholders. The remaining                shares are currently restricted as a result of securities laws or lock-up agreements but will become eligible to be sold at various times after the offering. Moreover, after this offering, holders of an aggregate of                shares of our common stock will have rights, subject to specified conditions, to require us to file registration statements covering their shares or, along with holders of an additional                shares of our common stock, to include their shares in registration statements that we may file for ourselves or other stockholders. We also intend to register all shares of common stock that we may issue under our equity compensation plans. Once we register these shares, they can be freely sold in the public market upon issuance, subject to volume limitations applicable to affiliates and the lock-up agreements described in the "Underwriting" section of this prospectus.

***You will incur immediate and substantial dilution as a result of this offering.***

If you purchase common stock in this offering, you will incur immediate and substantial dilution of \$            per share, representing the difference between the assumed initial public offering price of \$            per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, and our pro forma net tangible book value per share after giving effect to this offering. Moreover, we issued options in the past to acquire common stock at prices significantly below the assumed initial public offering price. As of September 30, 2014, there were 13,754,598 shares of common stock subject to outstanding options with a weighted average exercise price of \$0.80 per share. To the extent that these outstanding options are ultimately exercised, you will incur further dilution.

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

We are an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, and may remain an emerging growth company for up to five years. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- providing only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure;
- not being required to comply with the auditor attestation requirements in the assessment of our internal control over financial reporting;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements;
- reduced disclosure obligations regarding executive compensation; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

We may choose to take advantage of some, but not all, of the available exemptions. We have taken advantage of reduced reporting burdens in this prospectus. In particular, in this prospectus, we have provided only two years of audited financial statements and have not included all of the executive compensation related information that would be required if we were not an emerging growth company. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

In addition, the JOBS Act also provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

***We will incur increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives.***

As a public company, and particularly after we are no longer an "emerging growth company," we will incur significant legal, accounting and other expenses that we did not incur as a private company. We expect that we will need to hire additional accounting, finance and other personnel in connection with our becoming, and our efforts to comply with the requirements of being, a public company, and our management and other personnel will need to devote a substantial amount of time towards maintaining compliance with these requirements. In addition, the Sarbanes-Oxley Act of 2002 and rules subsequently implemented by the Securities and Exchange Commission and NASDAQ have imposed various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will need to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. For example, we expect that these rules and regulations may make it more difficult and more expensive for us to obtain director and officer liability insurance. Overall, we estimate that our incremental costs resulting from operating as a public company may be between \$2.0 million and \$4.0 million per year, which costs are in addition to our expected incremental costs resulting from operating as a stand-alone company.

Pursuant to Section 404 of the Sarbanes-Oxley Act of 2002, or Section 404, we will be required to furnish a report by our management on our internal control over financial reporting, including an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. However, while we remain an emerging growth company, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. We became a stand-alone company in February 2014 following the Spin-Out and, as such, have a very limited operating history. Accordingly, many of the internal controls over financial reporting have only recently been implemented and therefore have not been tested. To achieve compliance with Section 404 within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, potentially engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing that controls are functioning as documented and implement a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that neither we nor our independent registered public accounting firm will be able to conclude within the prescribed timeframe that our internal control over financial reporting is effective as required by Section 404. 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 expect to pay any dividends for the foreseeable future. Investors in this offering may never obtain a return on their investment.***

You should not rely on an investment in our common stock to provide dividend income. We do not anticipate that we will pay any dividends to holders of our common stock in the foreseeable future. Instead, we plan to retain any earnings to maintain and expand our existing operations. Accordingly, investors must rely on sales of their common stock after price appreciation, which may never occur, as the only way to realize any return on their investment. As a result, investors seeking cash dividends should not purchase our common stock.



***Our restated certificate of incorporation provides that the doctrine of "corporate opportunity" will not apply to any of our stockholders or directors, except in limited circumstances, which may adversely affect our business or prospects.***

Our restated certificate of incorporation provides that the doctrine of "corporate opportunity" will not apply to any of our stockholders or directors, other than any stockholder or director that is an employee of ours. The doctrine of corporate opportunity generally provides that a corporate fiduciary may not develop an opportunity using corporate resources, acquire an interest adverse to that of the corporation or acquire property that is reasonably incident to the present or prospective business of the corporation or in which the corporation has a present or expectancy interest, unless that opportunity is first presented to the corporation and the corporation chooses not to pursue that opportunity. The doctrine of corporate opportunity is intended to preclude officers or directors from personally benefiting from opportunities that belong to the corporation. We have renounced any prospective corporate opportunity so that our stockholders and directors (other than those that are employees of ours) and their respective representatives have no duty to communicate or present corporate opportunities to us and have the right to either hold any corporate opportunity for its (and its representatives') own account and benefit or to recommend, assign or otherwise transfer such corporate opportunity to persons other than us. As a result, our stockholders, directors and their respective affiliates will not be prohibited from investing in competing businesses or doing business with our customers. Therefore, we may be in competition with our stockholders, directors or their respective affiliates, and we may not have knowledge of, or be able to pursue, a transaction that could potentially be beneficial to us. Accordingly, we may lose a corporate opportunity or suffer competitive harm, which could negatively impact our business or prospects.

***We have broad discretion in the use of the net proceeds from this offering and may not use them effectively.***

We cannot specify with certainty the particular uses of the net proceeds we will receive from this offering. Our management will have broad discretion in the application of the net proceeds, including for any of the purposes described in "Use of Proceeds." Accordingly, you will have to rely upon the judgment of our management with respect to the use of the proceeds, with only limited information concerning management's specific intentions. Our management may spend a portion or all of the net proceeds from this offering in ways that our stockholders may not desire or that may not yield a favorable return. The failure by our management to apply these funds effectively could harm our business. Pending their use, we may invest the net proceeds from this offering in a manner that does not produce income or that loses value.

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

Provisions of our certificate of incorporation, our bylaws or Delaware law may discourage, delay or prevent a merger, acquisition or other change in control that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares of our common stock. These provisions may also prevent or frustrate attempts by our stockholders to change the composition of our board of directors or to replace or remove our management. These provisions include:

- limitations on the removal of directors;
- a classified board of directors so that not all members of our board are elected at one time;
- advance notice requirements for stockholder proposals and nominations;

- limitations on the ability of stockholders to call and bring business before special meetings and to take action by written consent in lieu of a meeting;
- limitations on the liability of, and the provision of indemnification to, our director and officers; and
- the ability of our board of directors to authorize the issuance of blank check preferred stock, which could be issued with voting, liquidation, dividend and other rights similar to our common stock.

In addition, we are subject to Section 203 of the Delaware General Corporation Law, which prohibits a publicly-held Delaware corporation from engaging in a business combination with an interested stockholder, generally a person which together with its affiliates owns, or within the last three years has owned, 15% of our voting stock, for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner.

The existence of the foregoing provisions and anti-takeover measures could limit the price that investors might be willing to pay in the future for shares of our common stock. They could also deter potential acquirers of our company, thereby reducing the likelihood that you could receive a premium for your common stock in an acquisition.

***If securities analysts do not publish research or reports about our business or if they publish negative evaluations of our stock, the price or trading volume of our stock could decline.***

The trading market for our common stock will rely in part on the research and reports that industry or financial analysts publish about us or our business. We do not currently have and may never obtain research coverage by industry or financial analysts. If no or few analysts commence coverage of us, the trading price of our stock would likely decrease. Even if we do obtain analyst coverage, if one or more of the analysts covering our business downgrade their evaluations of our stock, the price of our stock could decline. If one or more of these analysts cease to cover our stock, we could lose visibility in the market for our stock, which in turn could cause our stock price or trading volume to decline.

## SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS AND INDUSTRY DATA

This prospectus contains forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, contained in this prospectus, including statements regarding our strategy, future operations, future financial position, future revenues, projected costs, prospects, plans and objectives of management, are forward-looking statements. The words "anticipate," "believe," "estimate," "expect," "intend," "may," "might," "plan," "predict," "project," "target," "potential," "will," "would," "could," "should," "continue" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

The forward-looking statements in this prospectus include, among other things, statements about:

- the timing of the ongoing and expected clinical trials of our INOpulse and BCM product candidates, including statements regarding the timing of completion of the trials and the respective periods during which the results of the trials will become available;
- the timing of and our ability to obtain marketing approval of our product candidates, and the ability of our INOpulse and BCM product candidates to meet existing or future regulatory standards;
- our ability to operate, and the implementation of our business strategy, as a stand-alone company;
- our ability to comply with government laws and regulations;
- our commercialization, marketing and manufacturing capabilities and strategy;
- our estimates regarding the potential market opportunity for our product candidates;
- the timing of or our ability to enter into partnerships to market and commercialize our product candidates;
- the rate and degree of market acceptance of any product candidate for which we receive marketing approval;
- our intellectual property position;
- our expectations related to the use of proceeds from this offering;
- our estimates regarding expenses, future revenues, capital requirements and needs for additional funding and our ability to obtain additional funding;
- the success of competing treatments; and
- our competitive position.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included in this prospectus, particularly in the "Risk Factors" section, that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make.

You should read this prospectus and the documents that we reference in this prospectus and have filed as exhibits to the registration statement of which this prospectus is a part completely and with the understanding that our actual future results may be materially different from what we expect. The forward-looking statements contained in this prospectus are made as of the date of this prospectus, and we do not assume any obligation to update any forward-looking statements, except as required by applicable law.

This prospectus includes statistical and other industry and market data that we obtained from industry publications and research, surveys and studies conducted by third parties. Industry publications and third-party research, surveys and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information.

## USE OF PROCEEDS

We estimate that the net proceeds from our issuance and sale of \_\_\_\_\_ shares of our common stock in this offering will be approximately \$ \_\_\_\_\_ million, assuming an initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. If the underwriters exercise in full their option to purchase additional shares, we estimate that the net proceeds from this offering will be approximately \$ \_\_\_\_\_ million.

A \$1.00 increase (decrease) in the assumed initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the net proceeds to us from this offering by \$ \_\_\_\_\_ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. Each increase (decrease) of 1.0 million shares in the number of shares of common stock offered by us at the assumed initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the net proceeds to us from this offering by \$ \_\_\_\_\_ million, after deducting estimated underwriting discounts and commissions.

As of September 30, 2014, we had cash and cash equivalents of \$30.6 million and restricted cash of \$13.1 million. We currently estimate that we will use the net proceeds from this offering, together with our cash, cash equivalents and restricted cash, as follows:

- approximately \$ \_\_\_\_\_ to fund to completion our ongoing clinical trial of BCM;
- approximately \$ \_\_\_\_\_ to fund our planned Phase 3 clinical development of INOpulse for PAH; and
- the remainder for working capital and other general corporate purposes.

This expected use of the net proceeds from this offering and our existing cash, cash equivalents and restricted cash represents our intentions based upon our current plans and business conditions. The amounts and timing of our actual expenditures may vary significantly depending on numerous factors, including the progress of our development and commercialization efforts, the status of and results from clinical trials, as well as any collaborations that we may enter into with third parties for our product candidates, and any unforeseen cash needs. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering.

Based on our planned use of the net proceeds from this offering and our existing cash, cash equivalents and restricted cash described above, we estimate that such funds will be sufficient to enable us to complete our ongoing clinical trial for BCM, to fund the first trial in our planned Phase 3 clinical development of INOpulse for PAH and to fund our operating expenses and capital requirements for at least the next \_\_\_\_\_ months. We have based this estimate on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect. We do not expect that the net proceeds from this offering and our existing cash, cash equivalents and restricted cash will be sufficient to enable us to fund the completion of development and commercialization of any of our product candidates.

Pending our use of the net proceeds from this offering, we intend to invest the net proceeds in short-term, interest-bearing, investment-grade securities.

## **DIVIDEND POLICY**

We have never declared or paid cash dividends on our common stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. We do not intend to pay cash dividends in respect of our common stock in the foreseeable future.

## CORPORATE CONVERSION

We are currently a Delaware limited liability company. Prior to the effectiveness of the registration statement of which this prospectus forms a part, we will complete transactions pursuant to which we will convert into a Delaware corporation and change our name to Bellerophon Therapeutics, Inc. In addition, entities affiliated with certain of our principal stockholders will be merged with and into us. In this prospectus, we refer to all of the transactions related to our conversion to a corporation and the mergers described above as the Corporate Conversion. To consummate the Corporate Conversion, we will file a certificate of conversion with the Secretary of State of the State of Delaware. In connection with the Corporate Conversion:

- holders of our outstanding voting units will receive one share of voting common stock for each voting unit held immediately prior to the Corporate Conversion;
- holders of our outstanding non-voting units will receive one share of non-voting common stock for each non-voting unit held immediately prior to the Corporate Conversion; and
- options to purchase our non-voting units will become options to purchase one non-voting share of our common stock for each unit underlying such options immediately prior to the Corporate Conversion, at the same aggregate exercise price in effect prior to the Corporate Conversion.

Assuming the Corporate Conversion became effective as of September 30, 2014:

- 94,247,411 outstanding voting units of Bellerophon Therapeutics LLC would have converted into an aggregate of 94,247,411 shares of our voting common stock;
- 4,672,001 outstanding non-voting units of Bellerophon Therapeutics LLC would have converted into an aggregate of 4,672,001 shares of our non-voting common stock; and
- outstanding options to purchase 13,754,598 non-voting units of Bellerophon Therapeutics LLC would have become options to purchase an aggregate of 13,754,598 shares of our non-voting common stock, with exercise prices ranging from \$0.02 to \$1.43.

In connection with the Corporate Conversion, Bellerophon Therapeutics, Inc. will continue to hold all assets of Bellerophon Therapeutics LLC and will assume all of its liabilities and obligations. Bellerophon Therapeutics, Inc. will be governed by a certificate of incorporation filed with the Delaware Secretary of State and bylaws. On the effective date of the Corporate Conversion, the members of the board of directors of Bellerophon Therapeutics LLC will become members of the board of directors of Bellerophon Therapeutics, Inc. and the officers of Bellerophon Therapeutics LLC will become the officers of Bellerophon Therapeutics, Inc.

For the convenience of the reader, except as context otherwise requires, all information included in this prospectus is presented giving effect to the Corporate Conversion.

## CAPITALIZATION

The following table sets forth our cash and cash equivalents, restricted cash and capitalization as of September 30, 2014:

- on an actual basis;
- on a pro forma basis to give effect to the Corporate Conversion; and
- on a pro forma as adjusted basis to give further effect to (i) our issuance and sale of                      shares of our common stock in this offering at an assumed initial public offering price of \$                      per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us and (ii) the conversion of all of our outstanding shares of non-voting common stock into shares of voting common stock.

You should read this table together with our financial statements and the related notes appearing at the end of this prospectus and the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of this prospectus.

(in thousands)	September 30, 2014		
	Actual (unaudited)	Pro Forma (unaudited)	Pro Forma As Adjusted (unaudited)
Cash and cash equivalents	\$ 30,605		
Restricted cash(1)	13,127		
<b>Members' equity:</b>			
Members' equity(2)	76,550		
Additional paid-in capital	—		
Common stock, \$0.01 par value per share; no shares authorized, issued or outstanding, actual;                      shares authorized,                      shares issued and outstanding, pro forma; and                      shares authorized,                      shares issued and outstanding, pro forma as adjusted	—		
Accumulated deficit	(41,450)		
<b>Total members' equity</b>	<b>35,100</b>		
<b>Total capitalization</b>	<b>\$ 35,100</b>		

- (1) Represents cash deposited in escrow to pay amounts owed under the transition services agreement with Ikaria.
- (2) Represents voting units (no par value per unit; 94,247,411 units authorized, issued and outstanding, actual; and no units authorized, issued or outstanding, pro forma and pro forma as adjusted) and non-voting units (no par value per unit; 19,416,481 units authorized and 4,672,001 units issued and outstanding, actual; and no units authorized, issued or outstanding, pro forma and pro forma as adjusted).

A \$1.00 increase (decrease) in the assumed initial public offering price of \$                      per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, additional paid-in capital and total capitalization by \$                      million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. Each increase (decrease) of 1.0 million shares in the number of shares of common stock offered by us at the assumed initial public offering price of \$                      per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, additional paid-in capital and total capitalization by \$                      million, after deducting estimated underwriting discounts and commissions.



## DILUTION

If you invest in our common stock in this offering, your ownership interest will be diluted immediately to the extent of the difference between the public offering price per share of our common stock and the pro forma net tangible book value per share of our common stock after this offering.

Our historical net tangible book value as of September 30, 2014 was \$       million, or \$       per share of our common stock. Historical net tangible book value per share represents the amount of our total tangible assets less total liabilities, divided by the number of shares of our common stock outstanding, after giving effect to the Corporate Conversion.

After giving effect to our issuance and sale of       shares of our common stock in this offering at an assumed initial public offering price of \$       per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma net tangible book value as of       would have been \$       million, or \$       per share, in each case giving effect to the Corporate Conversion. This represents an immediate increase in pro forma net tangible book value per share of \$       to existing stockholders and immediate dilution of \$       in pro forma net tangible book value per share to new investors purchasing common stock in this offering. Dilution per share to new investors is determined by subtracting pro forma net tangible book value per share after this offering from the initial public offering price per share paid by new investors. The following table illustrates this dilution on a per share basis:

Assumed initial public offering price per share	\$
Historical net tangible book value per share as of September 30, 2014	\$
Pro forma net tangible book value per share as of	
Increase in net tangible book value per share attributable to new investors	
Pro forma as adjusted net tangible book value per share after giving effect to this offering	
Dilution per share to new investors purchasing shares in this offering	\$

A \$1.00 increase (decrease) in the assumed initial public offering price of \$       per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) our pro forma net tangible book value by \$       , our pro forma net tangible book value per share after this offering by \$       , and the dilution per share to new investors by \$       , assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. Each increase (decrease) of 1.0 million shares in the number of shares of common stock offered by us at the assumed initial public offering price of \$       per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) our pro forma net tangible book value by \$       , our pro forma net tangible book value per share after this offering by \$       , and the dilution per share to new investors by \$       , after deducting estimated underwriting discounts and commissions.

If the underwriters exercise their option to purchase additional shares or if any additional shares are issued in connection with outstanding options, you will experience further dilution.

The following table summarizes, on a pro forma basis as of       , the total number of shares purchased from us, the total consideration paid, or to be paid, and the average price per share paid, or to be paid, by existing stockholders and by new investors in this offering at an assumed initial

public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, before deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

	Shares Purchased		Total Consideration		Average Price Per Share
	Number	Percent	Amount	Percent	
Existing stockholders			% \$ _____		0% \$ _____
New investors					
Total		100%		100%	

A \$1.00 increase (decrease) in the assumed initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the total consideration paid by new investors by \$ \_\_\_\_\_ million and increase (decrease) the percentage of total consideration paid by new investors by approximately \_\_\_\_\_ %, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same. Each increase (decrease) of 1.0 million shares in the number of shares of common stock offered by us at the assumed initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the total consideration paid by new investors by approximately \$ \_\_\_\_\_ million and increase (decrease) the percentage of total consideration paid by new investors by approximately \_\_\_\_\_ %.

If the underwriters exercise in full their option to purchase additional shares, the following will occur:

- the percentage of shares of our common stock held by existing stockholders will decrease to approximately \_\_\_\_\_ % of the total number of shares of our common stock outstanding after this offering; and
- the number of shares of our common stock held by new investors will increase to \_\_\_\_\_ , or approximately \_\_\_\_\_ % of the total number of shares of our common stock outstanding after this offering.

## SELECTED FINANCIAL INFORMATION

The following selected financial information for the years ended December 31, 2013 and 2012 has been derived from our audited financial statements as of and for the years ended December 31, 2013 and 2012 included elsewhere in this prospectus. The following summary financial information as of September 30, 2014 and for the nine months ended September 30, 2014 and 2013 has been derived from our unaudited condensed consolidated financial statements included elsewhere in this prospectus. The selected financial information below should be read in conjunction with our historical and pro forma financial statements and the related notes included elsewhere in this prospectus and the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of this prospectus.

Our financial statements for periods prior to the Spin-Out, which occurred on February 12, 2014, include allocations of costs from certain shared functions provided to us by Ikaria, including general corporate and shared services expenses. These allocations were made based on either specific identification or the proportionate percentage of employee time or headcount to the respective total Ikaria employee time or headcount, as applicable, and have been included in our financial statements for periods prior to February 12, 2014.

The financial statements included in this prospectus may not necessarily reflect our financial position, results of operations and cash flows as if we had operated as a stand-alone company during all of the periods presented. Our historical results for any prior period are not necessarily indicative of results to be expected in any future period, and our interim period results are not necessarily indicative of results to be expected for a full fiscal year or any other interim period.

(in thousands, except per share data)	Nine Months Ended September 30		Year Ended December 31,	
	2014	2013	2013	2012
	(unaudited)			
Statement of Operations and Comprehensive Loss Information				
Operating expenses:				
Research and development	\$ 36,368	\$ 39,068	\$ 52,985	\$ 38,727
General and administrative	10,537	6,155	9,013	7,185
Other operating expense	—	—	—	315
Net loss and comprehensive loss	<u>\$ (46,905)</u>	<u>\$ (45,223)</u>	<u>\$ (61,998)</u>	<u>\$ (46,227)</u>
Net loss per unit:				
Basic and diluted(1)	\$ (0.47)			

(in thousands)	As of September 30, 2014 (unaudited)	As of December 31,		As of September 30, 2014	
		2013	2012	Pro Forma(2) (unaudited)	Pro Forma As Adjusted(3)
<b>Balance Sheet Information</b>					
Cash and cash equivalents	\$ 30,605	—	—		
Restricted cash(4)	13,127	—	—		
Working capital (deficit)	27,906	(12,440)	(10,892)	—	—
Total assets	48,634	3,636	3,349		
Allocated portion of Ikaria special dividend bonus payable	—	4,273	2,865		
Other non-current liabilities	—	1,108	389		
Total long term liabilities	—	5,381	3,254		
Members' equity / invested (deficit)	35,100	(15,737)	(11,116)		—

- (1) The weighted average units outstanding for basic and diluted net loss per unit for the nine months ended September 30, 2014 is 98,930,615. No net loss per unit information is presented for periods prior to the Spin-Out.
- (2) The pro forma balance sheet information gives effect to the Corporate Conversion.

- (3) The pro forma as adjusted balance sheet information gives further effect to (i) our issuance and sale of \_\_\_\_\_ shares of our common stock in this offering at an assumed initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, and (ii) the conversion of all of our outstanding shares of non-voting common stock into shares of voting common stock.
- (4) Represents cash deposited into escrow to pay amounts owed under the transition services agreement with Ikaria.

A \$1.00 increase (decrease) in the assumed initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working (deficit) capital, total assets and members' equity/invested (deficit) by \$ \_\_\_\_\_ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. Each increase (decrease) of 1.0 million shares in the number of shares of common stock offered by us at the assumed initial public offering price of \$ \_\_\_\_\_ per share, which is the midpoint of the estimated price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working (deficit) capital, total assets and members' equity/invested (deficit) by \$ \_\_\_\_\_ million, after deducting estimated underwriting discounts and commissions.

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

*You should read the following discussion and analysis of our financial condition and results of operations together with our financial statements and the related notes appearing in this prospectus. Some of the information contained in this discussion and analysis or set forth elsewhere in this prospectus, including information with respect to our plans and strategy for our business and related financing, includes forward-looking statements that involve risks and uncertainties. You should read the "Risk Factors" section of this prospectus for a discussion of important factors that could cause our actual results to differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.*

### Overview

#### Business

We are a clinical-stage therapeutics company focused on developing innovative products at the intersection of drugs and devices that address significant unmet medical needs in the treatment of cardiopulmonary and cardiac diseases. We have two programs in advanced clinical development. The first program, INOpulse, is based on our proprietary pulsatile nitric oxide delivery device. We are currently developing two product candidates under our INOpulse program: one for the treatment of pulmonary arterial hypertension, or PAH, for which we intend to commence Phase 3 clinical trials in the second half of 2015, and the other for the treatment of pulmonary hypertension associated with chronic obstructive pulmonary disease, or PH COPD, which is in Phase 2 development. Our second program is bioabsorbable cardiac matrix, or BCM, which is currently in a placebo-controlled clinical trial designed to support CE mark registration in the European Union. Enrollment of this trial is almost complete with more than 290 out of 306 patients enrolled, as of November 15, 2014. Assuming positive results from this trial, we intend to conduct a pivotal pre-market approval trial of BCM beginning in the first half of 2016, which will be designed to support registration in the United States. We are developing BCM for the prevention of cardiac remodeling, which often leads to congestive heart failure following an ST-segment elevated myocardial infarction, or STEMI.

We have devoted substantially all of our resources to our drug discovery and development efforts, including conducting clinical trials for our product candidates, protecting our intellectual property and the general and administrative support of these operations. We have devoted significant time and resources to developing and optimizing our drug delivery system, INOpulse, which operates through the administration of nitric oxide as brief, controlled pulses that are timed to occur at the beginning of a breath. In addition, we have incurred significant costs to scale up manufacturing for BCM from pre-clinical studies to clinical trials.

To date, we have generated no revenue from product sales. We expect that it will be several years before we commercialize a product candidate, if ever.

#### Separation and Spin-Out from Ikaria

Prior to February 2014, we were a wholly-owned subsidiary of Ikaria. As part of an internal reorganization of Ikaria in October 2013, Ikaria transferred to us exclusive worldwide rights, with no royalty obligations, to develop and commercialize pulsed nitric oxide in PAH, PH-COPD and pulmonary hypertension associated with idiopathic pulmonary fibrosis, or PH-IPF. Following the internal reorganization, in February 2014, Ikaria distributed all of our then outstanding units to its stockholders through the payment of a special dividend on a pro rata basis based on each stockholder's ownership of Ikaria capital stock, which we refer to as the Spin-Out, and as a result we became a stand-alone company.

For purposes of our financial statements, our inception date is August 26, 2009, which is the date that BCM was licensed to us by BioLineRx Ltd. and its subsidiary, which we refer to collectively as BioLine. Our operations since that date have included organization and staffing, business planning, in-licensing technology, developing product candidates in clinical programs, evaluating potential future product candidates, as well as undertaking pre-clinical studies and clinical trials of our product candidates.

We are in the process of developing and implementing plans to replace services currently provided to us by Ikaria under our transition services agreement, which we refer to as the TSA. These services include, among others, accounting and financial management support, human resources support, drug and device safety services, biometrics support and manufacturing support. We expect the costs related to replacing the services currently provided by Ikaria under the TSA will be approximately the same as the \$772,000 per month that we are currently paying under the TSA. However, although we believe our estimates are reasonable based on the information we have to date, certain significant components of our estimates are preliminary and subject to change.

#### ***Accounting for the Separation and Spin-Out***

Our historical financial statements for periods prior to February 12, 2014, the date of the Spin-Out, included in this prospectus and discussed in this Management's Discussion and Analysis of Financial Condition and Results of Operations were derived from the audited historical financial statements and accounting records of Ikaria and include allocations for direct costs and indirect costs attributable to the research and development segment of Ikaria. In particular, for periods prior to February 12, 2014, our financial statements include expense allocations for (1) certain corporate functions historically provided by Ikaria, including finance, audit, legal, information technology and human resources services, (2) research and development expenses and (3) stock-based compensation. These allocations are based on either specific identification or allocation methods such as time and wage studies, headcount or other measures determined by us. Management believes that the statements of operations for periods prior to the Spin-Out include a reasonable allocation of costs and expenses incurred by Ikaria from which we benefited. See Note 1 to the audited financial statements and Note 2 to the unaudited condensed consolidated financial statements, in each case included elsewhere in this prospectus.

Our historical balance sheets as of December 31, 2013 and 2012 include assets and liabilities of Ikaria that were identified as specifically attributable to our INOpulse and BCM product candidates and those that were allocated from Ikaria to us based on an estimate of the benefit derived by us from the underlying asset or liability. Ikaria historically used a centralized approach to cash management and financing of its operations. Cash transfers to us have been accounted for as a capital contribution from Ikaria. See Note 2 to the unaudited condensed consolidated financial statements included elsewhere in this prospectus.

Due to this presentation, the financial information included in this prospectus does not reflect what our financial position, results of operations and cash flows will be in the future or what our financial position, results of operations and cash flows would have been in the past had we been a public, stand-alone company during the periods presented.

#### ***Financial Position and Outlook***

Since inception, we have never been profitable and have incurred significant operating losses. Our net losses were \$46.9 million and \$45.2 million for the nine months ended September 30, 2014 and 2013, respectively, and \$62.0 million and \$46.2 million for the years ended December 31, 2013 and 2012, respectively. To date, our sole source of funding has been investments in us by our former parent company, Ikaria.

We expect to continue to incur significant expenses and operating losses for the foreseeable future as we continue the development and clinical trials of, and seek regulatory approval for, our product candidates. If we obtain regulatory approval for any of our product candidates, we expect to incur significant commercialization expenses. We do not currently have the infrastructure for the sale, marketing, manufacture and distribution of any products. To develop a commercial infrastructure, we will have to invest financial and management resources, some of which would have to be deployed prior to having any certainty of marketing approval.

We have entered into license agreements with Ikaria and BioLine pursuant to which we obtained rights to our product candidates. In the future, we may enter into additional licensing agreements for new product candidates or strategic or co-promotion agreements with partners for the development and/or commercialization of product candidates in the United States or other countries.

Following consummation of this offering, we expect to incur additional costs associated with operating as a public company. Unless and until we generate sufficient revenue to be profitable, we will seek to fund our operations primarily through public or private equity or debt financings or other means, which may include strategic partnerships with third parties in the United States or other countries with respect to certain or all of our programs. Other additional financing may not be available to us on acceptable terms, or at all. Our failure to raise capital as and when needed could have a material adverse effect on our business, results of operations, financial condition, cash flows and future prospects.

## **Financial Operations Overview**

### ***Revenue***

To date, we have not generated any revenue from product sales and do not expect to generate any revenue from product sales for the next several years, if ever. In the future, we may generate revenue from a combination of product sales, license fees and milestone payments in connection with strategic partnerships, and royalties from the sale of products developed under licenses of our intellectual property. Our ability to generate revenue and become profitable depends primarily on our ability to successfully develop and commercialize or partner our INOpulse and/or BCM product candidates, each of which is currently in clinical development, as well as any product candidates we may advance in the future. We expect that any revenue we may generate will fluctuate from quarter to quarter as a result of the timing and amount of any payments we may receive under future partnerships, if any, and from sales of any products we successfully develop and commercialize. If we fail to complete the development of any of our product candidates currently in clinical development or any future product candidates in a timely manner, or to obtain regulatory approval for such product candidates, our ability to generate future revenue, and our business, results of operations, financial condition and cash flows and future prospects would be materially adversely affected.

### ***Research and Development Expenses***

Research and development expenses consist of costs incurred in connection with the discovery and development of our product candidates, including upfront and development milestone payments, related to in-licensed product candidates and technologies.

In order to fairly present our historical information, prior to the Spin-Out, certain departmental expenses from Ikaria have been allocated to us. The allocations were applied to us for the purpose of presenting our company as a stand-alone entity. Direct and indirect costs for periods prior to the Spin-Out related to the INOpulse and BCM clinical programs have been allocated to us. All allocations were based on actual costs incurred. For purposes of allocating non-project specific expenses, each Ikaria department head provided information as to the percentage of employee time incurred on our behalf.

Research and development expenses primarily consist of:

- employee-related expenses, including salary, benefits and allocated stock-based compensation expense;
- expenses incurred under agreements with contract research organizations, investigative sites that conduct our clinical trials and consultants that conduct a portion of our pre-clinical studies;
- expenses relating to vendors in connection with research and development activities;
- the cost of acquiring and manufacturing clinical trial materials;
- facilities, depreciation of fixed assets and other allocated expenses;
- lab supplies, reagents, active pharmaceutical ingredients and other direct and indirect costs in support of our pre-clinical and clinical activities;
- device development and drug manufacturing engineering;
- license fees related to in-licensed products and technology; and
- costs associated with non-clinical activities and regulatory approvals.

We expense research and development costs as incurred.

Conducting a significant amount of research and development is central to our business model. Product candidates in late stages of clinical development generally have higher development costs than those in earlier stages of clinical development primarily due to the increased size and duration of late-stage clinical trials. We plan to increase our research and development expenses for the foreseeable future as we seek to continue multiple clinical trials for our INOpulse and BCM programs, including to potentially advance INOpulse for PH-IPF, and seek to identify additional early-stage product candidates.

We track external research and development expenses and personnel expenses on a program-by-program basis. We use our employee and infrastructure resources, including regulatory affairs, quality, biometrics support and program management, across our two clinical development programs and have included these expenses in research and development infrastructure. Research and development laboratory and depreciation expenses are also not allocated to a specific program and are included in research and development infrastructure. Engineering activities related to INOpulse and the manufacture of cylinders related to INOpulse are included in INOpulse engineering. Below is a summary of our research and development expenses for the years ended December 31, 2013 and 2012 and the period from our inception through September 30, 2014.

(in thousands)	Year Ended December 31,		Period from
	2013	2012	August 26, 2009 (inception) to September 30, 2014
Research and development expenses			
BCM	\$ 17,266	\$ 14,609	\$ 76,948
PAH	8,099	8,544	26,317
PH-COPD	8,420	1,767	13,735
Clinical programs	33,785	24,290	117,000
Research and development infrastructure	14,000	10,387	45,167
INOpulse engineering	5,200	3,420	22,088
Total research and development expenses	<u>\$ 52,985</u>	<u>\$ 38,727</u>	<u>\$ 184,255</u>



### *INOpulse for PAH*

We completed a randomized, placebo-controlled, double-blind Phase 2 clinical trial of INOpulse for PAH in October 2014. The goal of the trial is to determine the safety, tolerability and efficacy of two different doses of INOpulse for PAH. We have received results from this trial, and we intend to finalize our plans for this program following an End of Phase 2 meeting scheduled with the U.S. Food and Drug Administration, or the FDA, in January 2015 as well as following additional discussions with European regulatory authorities. Currently, we intend to begin Phase 3 clinical trials in the second half of 2015.

### *INOpulse for PH-COPD*

We completed a randomized, placebo-controlled, double-blind, dose-confirmation Phase 2 clinical trial of INOpulse for PH-COPD in July 2012. We have received results from this trial, and we are currently evaluating our trial design for a Phase 2b clinical trial and plan to finalize our protocol following discussions with regulatory authorities in the United States and the European Union.

### *BCM*

We initiated a clinical trial of BCM, which we refer to as our PRESERVATION I trial, in December 2011 and enrolled the first patient in April 2012. This trial is a CE mark registration trial in the European Union and, if the results are positive, we intend to conduct a pivotal trial designed to support registration in the United States. We plan to enroll approximately 300 patients in this trial at up to approximately 90 clinical sites in Europe, Australia, North America and Israel. We expect to complete this trial by mid-2015. As of November 15, 2014, we had enrolled 290 patients.

### *Research and Development Infrastructure*

We invest in regulatory, quality, pharmacovigilance and program management activities, which are expensed as incurred. These activities primarily support our INOpulse and BCM clinical development programs.

### *INOpulse Engineering and Manufacturing*

We have invested a significant amount of funds in INOpulse, which is configured to be highly portable and compatible with available modes of long-term oxygen therapy via nasal cannula delivery. Our Phase 2 clinical trials of INOpulse for PAH and INOpulse for PH-COPD utilized the first generation INOpulse DS device. We are near completion of a second generation INOpulse Mark2 device, which we refer to as the Mark2, as well as a custom triple-lumen cannula, each of which we believe will significantly improve several characteristics of our INOpulse delivery system but will require prototype manufacturing and bench top testing, as well as verification and validation. We have also invested in design and engineering technology, through Ikaria, for the manufacture of our drug cartridges. We currently rely on Ikaria for manufacturing of our INOpulse devices and drug cartridges. Our current device manufacturing agreement with Ikaria terminates in February 2015. We plan to either negotiate a new agreement with Ikaria following termination of the device manufacturing agreement or enter into an arrangement with a third-party manufacturer. In addition to manufacturing our INOpulse delivery system, Ikaria is conducting substantial engineering and stability testing work with respect to the INOpulse devices on our behalf pursuant to the TSA.

It is difficult to determine with certainty the duration and completion costs of our current or any future pre-clinical programs and any of our current or future clinical trials for our INOpulse and BCM programs and any future product candidates we may advance, or if, when or to what extent we will generate revenue from the commercialization and sale of any of our product candidates that obtain regulatory approval. We may never succeed in achieving regulatory approval for any of our product

candidates. The duration, costs and timing of clinical trials and development of our product candidates will depend on a variety of factors, including the uncertainties of any future clinical trials and pre-clinical studies, uncertainties in clinical trial enrollment rate and significant and changing government regulation. In addition, the probability of success for each product candidate will depend on numerous factors, including competition, manufacturing capability and commercial viability. A change in the outcome of any of these variables with respect to the development of a product candidate could change significantly the costs and timing associated with the development of that product candidate. For example, if the FDA or other regulatory authority were to require us to conduct clinical trials beyond those that we currently anticipate will be required for the completion of clinical development of a product candidate, or if we experience significant delays in enrollment in any of our clinical trials, we could be required to expend significant additional financial resources and time with respect to the development of that product candidate. We will determine which programs to pursue and how much to fund each program in response to the scientific and clinical success of each product candidate, as well as an assessment of each product candidate's commercial potential, including the likelihood of regulatory approval on a timely basis.

### ***General and Administrative Expenses***

General and administrative expenses consist principally of salaries and costs related to executive, finance, business development, marketing, legal and human resources functions, either through direct expenses or the TSA. Other general and administrative expenses include patent filing, patent prosecution, professional fees for legal, insurance, consulting, information technology and auditing and tax services not otherwise included in research and development expenses.

We anticipate that our general and administrative expenses will increase in the future for the following reasons, among others:

- we expect to incur increased general and administrative expenses to support ourselves as a stand-alone company, such as investing in a new general ledger system and new telecommunications services;
- we expect to incur, prior to the termination of the TSA, expenses in preparation for replacing services that are currently provided by Ikaria pursuant to the TSA, which will likely include dedicated accounting and human resources functions;
- we expect to incur increased general and administrative expenses to support our research and development activities, which we expect will expand as we continue to pursue the development of our product candidates;
- we expect our general and administrative expenses will increase as a result of increased payroll, expanded infrastructure, higher consulting, legal, accounting and investor relations costs, director compensation and director and officer insurance premiums associated with being a public company; and
- we may begin to incur expenses related to sales and marketing of our product candidates in anticipation of commercial launch before we receive regulatory approval of a product candidate.

## Results of Operations

### Comparison of Nine Months Ended September 30, 2014 and 2013

The following table summarizes our results of operations for the nine months ended September 30, 2014 and 2013, together with the changes in these items in dollars and as a percentage.

(Dollar amounts in thousands)	Nine Months Ended September 30,		\$ Change	% Change
	2014	2013		
Research and development expenses:				
BCM	\$ 10,007	\$ 12,403	\$ (2,396)	(19)%
PAH	8,315	5,809	2,506	43
PH-COPD	3,066	6,546	(3,480)	(53)
Clinical programs	21,388	24,758	(3,370)	(14)
Research and development infrastructure	9,395	10,173	(778)	(8)
INOpulse engineering	5,585	4,137	1,448	35
Total research and development expenses	36,368	39,068	(2,700)	(7)
General and administrative	10,537	6,155	4,382	71
Total operating expenses	46,905	45,223	1,682	4
Net loss and comprehensive loss	<u>\$ (46,905)</u>	<u>\$ (45,223)</u>	<u>\$ (1,682)</u>	<u>4%</u>

**Total Operating Expenses.** Total operating expenses for the nine months ended September 30, 2014 were \$46.9 million compared to \$45.2 million for the nine months ended September 30, 2013, an increase of \$1.7 million, or 4%. This increase was primarily due to increases in general and administrative expenses, research and development expenses pertaining to INOpulse for PAH, and INOpulse engineering and manufacturing, partially offset by reductions in research and development expenses pertaining to our BCM clinical program and INOpulse for PH-COPD and research and development infrastructure expenses.

**Research and Development Expenses.** Total research and development expenses for the nine months ended September 30, 2014 were \$36.4 million compared to \$39.1 million for the nine months ended September 30, 2013, a decrease of \$2.7 million, or 7%. Total research and development expenses consisted of the following:

- BCM research and development expenses for the nine months ended September 30, 2014 were \$10.0 million compared to \$12.4 million for the nine months ended September 30, 2013, a decrease of \$2.4 million, or 19%. The decrease primarily resulted from the effect of certain non-recurring manufacturing costs in the 2013 period, as well as a decrease in the pre-clinical activities that we conducted with respect to BCM during the nine months ended September 30, 2014. This decrease was partially offset by an increase in clinical trial costs as a result of an increase in patient enrollments in the nine months ended September 30, 2014 as compared to the prior year period. Inception to date enrollment in the PRESERVATION I trial increased to 275 patients as of September 30, 2014 from 99 patients as of September 30, 2013.
- PAH research and development expenses for the nine months ended September 30, 2014 were \$8.3 million compared to \$5.8 million for the nine months ended September 30, 2013, an increase of \$2.5 million, or 43%. The increase was primarily due to higher clinical trial expenses in the nine months ended September 30, 2014, driven by higher patient enrollment costs as compared to the prior year period.
- PH-COPD research and development expenses for the nine months ended September 30, 2014 were \$3.1 million compared to \$6.6 million for the nine months ended September 30, 2013, a

decrease of \$3.5 million, or 53%. The decrease primarily resulted from lower dosing trial costs as a result of the completion of our Phase 2 clinical trial.

- Research and development infrastructure expenses for the nine months ended September 30, 2014 were \$9.4 million compared to \$10.2 million for the nine months ended September 30, 2013, a decrease of \$0.8 million, or 8%. The decrease was primarily the result of reductions in headcount in connection with managing staffing needs to support our INOpulse and BCM clinical programs.
- INOpulse engineering expenses for the nine months ended September 30, 2014 were \$5.6 million compared to \$4.1 million for the nine months ended September 30, 2013, an increase of \$1.5 million, or 35%. The increase was primarily due to increases in development costs as we transitioned from the INOpulse DS device to the Mark2.

**General and Administrative Expenses.** General and administrative expenses for the nine months ended September 30, 2014 were \$10.5 million compared to \$6.2 million for the nine months ended September 30, 2013, an increase of \$4.4 million, or 71%. The increase was primarily due to the incremental costs of operating as a stand-alone entity, including professional service fees, executive search costs, a period over period increase in retention bonuses and information technology expenditures.

#### Comparison of Years Ended December 31, 2013 and 2012

The following table summarizes our results of operations for the years ended December 31, 2013 and 2012, together with the changes in these items in dollars and as a percentage.

(Dollar amounts in thousands)	Year Ended December 31,		\$ Change	% Change
	2013	2012		
Research and development expenses:				
BCM	\$ 17,266	\$ 14,609	\$ 2,657	18%
PAH	8,099	8,544	(445)	(5)
PH-COPD	8,420	1,767	6,653	377
Clinical programs	33,785	24,920	8,865	36
Research and development infrastructure	14,000	10,387	3,613	35
INOpulse engineering	5,200	3,420	1,780	52
Total research and development expenses	52,985	38,727	14,258	37
General and administrative	9,013	7,185	1,828	25
Other operating expenses	—	315	(315)	(100)
Total operating expenses	61,998	46,227	15,771	34
Net loss and comprehensive loss	\$ (61,998)	\$ (46,227)	\$ (15,771)	34%

**Total Operating Expenses.** Total operating expenses for the year ended December 31, 2013 were \$62.0 million compared to \$46.2 million for the year ended December 31, 2012, an increase of \$15.8 million, or 34%. This increase was primarily due to an increase in research and development expenses pertaining to our BCM and INOpulse for PH-COPD clinical programs, research and development infrastructure, INOpulse engineering and manufacturing, and general and administrative expenses.

**Research and Development Expenses.** Total research and development expenses for the year ended December 31, 2013 were \$53.0 million compared to \$38.7 million for the year ended December 31,

2012, an increase of \$14.3 million, or 37%. Total research and development expenses consisted of the following:

- BCM research and development expenses for the year ended December 31, 2013 were \$17.3 million compared to \$14.6 million for the year ended December 31, 2012, an increase of \$2.7 million, or 18%. The increase was primarily due to increased enrollment in our PRESERVATION I trial to 120 patients in 2013 from 19 patients in 2012.
- PAH research and development expenses for the year ended December 31, 2013 were \$8.1 million compared to \$8.5 million for the year ended December 31, 2012, a decrease of \$0.4 million, or 5%. The decrease was primarily due to a smaller number of devices being manufactured for our INOpulse for PAH trial in 2013 as compared to 2012, partially offset by increased patient enrollment in the Phase 2 clinical trial of INOpulse for PAH to 47 patients in 2013 from ten patients in 2012.
- PH-COPD research and development expenses for the year ended December 31, 2013 were \$8.4 million compared to \$1.8 million for the year ended December 31, 2012, an increase of \$6.7 million, or 377%. The increase resulted from commencement of the first part of the Phase 2 clinical trial of INOpulse for PH-COPD in 2013.
- Research and development infrastructure expenses for the year ended December 31, 2013 were \$14.0 million compared to \$10.4 million for the year ended December 31, 2012, an increase of \$3.6 million, or 35%. The increase was primarily due to a higher level of professional and consulting fees to support our INOpulse and BCM clinical programs, including those related to program risk analysis, regulatory, biometrics and drug and device safety in 2013.
- INOpulse engineering expenses for the year ended December 31, 2013 were \$5.2 million compared to \$3.4 million for the year ended December 31, 2012, an increase of \$1.8 million, or 52%. The increase was primarily due to increased engineering activity related to the INOpulse devices in 2013.

**General and Administrative Expenses.** General and administrative expenses for the year ended December 31, 2013 were \$9.0 million compared to \$7.2 million for the year ended December 31, 2012, an increase of \$1.8 million, or 25%. The increase was primarily due to allocated finance costs.

**Other Operating Expenses.** In 2012, we incurred a \$0.3 million restructuring charge recorded for the impairment of fixed assets related to the closure of the research and development facility in Seattle, Washington, as we moved research and development operations to our facilities in North Brunswick, New Jersey.

## Liquidity and Capital Resources

Since our inception, we have incurred net losses and negative cash flows from our operations. We incurred net losses of \$46.9 million and \$45.2 million for the nine months ended September 30, 2014 and 2013, respectively, and \$62.0 million and \$46.2 million for the years ended December 31, 2013 and 2012, respectively. Our operating activities used \$58.2 million and \$44.7 million of cash during the nine months ended September 30, 2014 and 2013, respectively, and \$57.2 million and \$36.2 million of cash during the years ended December 31, 2013 and 2012, respectively. As of September 30, 2014, all of the cash used in our operating activities was contributed to us by our former parent company, Ikaria.

In addition, we had working capital of \$27.9 million and \$43.7 million of cash, cash equivalents and restricted cash as of September 30, 2014, which we expect to be sufficient to fund our operating needs at least through March 31, 2015. The inability to obtain additional financing through a public offering or other alternatives could adversely affect our short- and long-term ability to achieve our intended business objectives. This uncertainty raises substantial doubt as to our ability to continue as a

going concern. The financial statements do not include any adjustment that might be necessary if we were unable to continue as a going concern.

## Cash Flows

The following table summarizes our cash flows for the nine months ended September 30, 2014 and 2013 and the years ended December 31, 2013 and 2012:

(in thousands)	Nine Months Ended September 30,		Year Ended December 31,	
	2014	2013	2013	2012
	(unaudited)			
Net cash (used in) provided by:				
Operating activities	\$ (58,171)	(44,714)	\$ (57,231)	\$ (36,224)
Investing activities	—	(1,077)	(727)	(3,478)
Financing activities	88,776	45,791	57,958	39,702
Net increase in cash and cash equivalents	<u>\$ 30,605</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ —</u>

### Net Cash Used in Operating Activities

Cash used in operating activities for the nine months ended September 30, 2014 was \$58.2 million compared to \$44.7 million for the nine months ended September 30, 2013, an increase of \$13.5 million, or 30%. The increase in cash used in operating activities was primarily due to the deposit of escrowed cash in connection with the TSA. Cash used in operating activities for the year ended December 31, 2013 was \$57.2 million compared to \$36.2 million for the year ended December 31, 2012, an increase of \$21.0 million, or 58%. The increase was driven by clinical development expenses attributable to activity in the INOpulse and BCM clinical programs.

### Net Cash Used in Investing Activities

Cash used in investing activities for the nine months ended September 30, 2014 was \$0, compared to \$1.1 million of cash used in investing activities for the nine months ended September 30, 2013. Cash used in investing activities for the year ended December 31, 2013 was \$0.7 million compared to \$3.5 million for the year ended December 31, 2012, a decrease of \$2.8 million, or 79%. The decrease in cash used in investing activities for the year ended December 31, 2013 compared to the year ended December 31, 2012 was primarily the result of a reduction in capital expenditures due to the timing of device investments to support our clinical trials.

### Net Cash Provided by Financing Activities

Cash provided by financing activities for the nine months ended September 30, 2014 was \$88.8 million compared to \$45.8 million for the nine months ended September 30, 2013, an increase of \$43.0 million, or 94%. The increase was primarily due to a cash contribution of \$80.0 million from Ikaria in connection with the Spin-Out. Cash provided by financing activities for the year ended December 31, 2013 was \$58.0 million compared to \$39.7 million for the year ended December 31, 2012, an increase of \$18.3 million, or 46%. The increase was primarily due to the increased net investment by Ikaria in 2013 that is discussed in Note 9 of the notes to our historical audited financial statements appearing elsewhere in this prospectus.

## Plan of Operations and Future Funding Requirements

Our primary uses of capital are, and we expect will continue to be, compensation and related expenses, third-party clinical research and development services, contract manufacturing services,

laboratory and related supplies, clinical costs, legal and other regulatory expenses and general overhead costs.

We expect that the anticipated net proceeds from this offering, together with our cash, cash equivalents and restricted cash as of September 30, 2014, will fund our operating expenses and capital expenditure requirements through \_\_\_\_\_, which we expect will enable us to complete our ongoing clinical trial for BCM, to fund the first trial in our planned Phase 3 clinical development of INOpulse for PAH and to fund our operating expenses and capital requirements for at least the next \_\_\_\_\_ months. We have based these estimates on assumptions that may prove to be wrong, and we may exhaust our capital resources sooner than we expect. In addition, the process of testing product candidates in clinical trials is costly, and the timing of progress in clinical trials is uncertain. Because our product candidates are in clinical development and the outcome of these efforts is uncertain, we cannot estimate the actual amounts that will be necessary to successfully complete the development and commercialization of our product candidates or whether, or when, we may achieve profitability. Our future capital requirements will depend on many factors, including:

- the timing, progress and results of our ongoing and planned clinical trials of INOpulse for PAH, INOpulse for PH-COPD and BCM;
- our ability to manufacture sufficient supply of our product candidates and the costs thereof;
- discussions with regulatory agencies regarding the design and conduct of our clinical trials and the costs, timing and outcome of regulatory review of our product candidates;
- the costs and timing of future commercialization activities, including product manufacturing, marketing, sales and distribution for any of our product candidates for which we receive marketing approval;
- the number and development requirements of any other product candidates we pursue;
- our ability to enter into collaborative agreements and achieve milestones under those agreements;
- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval;
- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims;
- our expenses as a stand-alone company; and
- the extent to which we acquire or in-license other products and technologies.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of equity and debt offerings, existing working capital and funding from potential future collaboration arrangements. To the extent that we raise additional capital through the future sale of equity or debt, the ownership interest of our existing stockholders will be diluted, and the terms of such securities may include liquidation or other preferences that adversely affect the rights of our existing stockholders. If we raise additional funds through strategic partnerships in the future, we may have to relinquish valuable rights to our technologies, future revenue streams or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

**Contractual Obligations and Commitments**

The following is a summary of our long-term contractual cash obligations as of December 31, 2013 (in thousands):

<u>Contractual Obligations</u>	<u>Payments Due by Period (\$)</u>				
	<u>Total</u>	<u>Less than 1 year</u>	<u>1 to 3 years</u>	<u>3 to 5 years</u>	<u>More than 5 years</u>
Operating Lease Obligations(1)	28	28	—	—	—

- (1) Operating lease obligations reflect our obligation to make payments in connection with a lease for our operating facilities. The amounts in the table do not include (i) approximately \$110,000 of milestone rent payable upon the closing of this offering or (ii) our rent obligation of \$113,400 through March 15, 2015 under a lease that we signed subsequent to December 31, 2013.

Under the TSA, Ikaria provides certain administrative and other services to us for a period of 24 months following February 9, 2014, unless terminated earlier. Ikaria also provides us with the use of office space and research laboratory facilities at Ikaria's headquarters located in Hampton, New Jersey. In exchange for the services provided by Ikaria pursuant to the TSA, we pay to Ikaria a service fee in the amount of \$772,000 per month and reimburse Ikaria for any out-of-pocket expenses, any taxes imposed on Ikaria in connection with the provision of services under the TSA and Ikaria's costs and expenses incurred in connection with the performance of any extraordinary services. The monthly service fee is payable by us regardless of the frequency or quantity of services actually utilized by us, and our obligation to pay such monthly service fee for 24 months will survive any early termination of the TSA. At the time of the Spin-Out, we deposited the sum of \$18.5 million, representing the aggregate of the \$772,000 monthly service fees payable by us under the TSA, in escrow to guarantee payment of the monthly service fees.

Milestone and royalty payments associated with our license agreement with BioLine have not been included in the above table of contractual obligations as we cannot reasonably estimate if or when they will occur. Under the terms of the license agreement, if we achieve certain clinical and regulatory events specified in the license agreement, we will be obligated to pay milestone payments to BioLine, which could total, in the aggregate, up to \$115.5 million, and if we achieve certain commercialization targets specified in the license agreement, we will be obligated to pay additional milestone payments to BioLine, which could total, in the aggregate, up to \$150.0 million. In addition, we will be obligated to pay BioLine a specified percentage of any upfront consideration we receive for sublicensing BCM, as well as royalties at a percentage in the low double digits below 20% on net sales, if any, of any approved product containing BCM, subject to offsets for specified payments to third parties made in connection with such product.

BioLine has indicated to us that it believes that we have breached the license agreement in several ways, including, but not limited to, failure to use commercially reasonable efforts to develop BCM, failure to provide BioLine with material information concerning the development and commercialization plans for BCM and failure to notify BioLine in advance of material public disclosures regarding BCM. We and BioLine also disagree about the timing of a \$12.5 million milestone payment that we would owe BioLine based upon progress in our BCM clinical development program. We believe we have complied with our obligations under the license agreement to use commercially reasonable efforts to develop BCM and are not currently in breach of our other obligations under the license agreement. Although we have had multiple discussions with BioLine on these issues, and these discussions are continuing, we have not been able to resolve these outstanding issues. If we are unable to reach agreement with BioLine on these issues, BioLine could bring a lawsuit against us, although any claims relating to our alleged failure to use commercially reasonable efforts would first be subject to a non-binding 60-day mediation period with a third-party mediator. We believe that we would have strong defenses in any litigation that could be brought by BioLine. If BioLine were to prevail in any



such litigation, one of the potential remedies would be the return of BCM to BioLine. In addition, if BioLine were to prevail in any such litigation, or if we were required to pay the milestone in dispute sooner than we had planned, or if we were required to return BCM to BioLine, these events could have a material adverse effect on our business, results of operations, financial condition and/or liquidity.

In the course of our normal business operations, we also enter into agreements with contract service providers and others to assist in the performance of our research and development and manufacturing activities. We can elect to discontinue the work under these contracts and purchase orders at any time with notice, and such contracts and purchase orders do not contain minimum purchase obligations.

#### **Off-Balance Sheet Arrangements**

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

#### **Critical Accounting Policies and Significant Judgments and Estimates**

Our management's discussion and analysis of our financial condition and results of operations is based on our financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expenses and the disclosure of contingent assets and liabilities in our financial statements. On an ongoing basis, we evaluate our estimates and judgments, including those related to research and development expense, impairment of long-lived assets, stock-based compensation and income taxes. We base our estimates on historical experience, known trends and events and various other factors that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in Note 2 of the notes to our audited financial statements appearing elsewhere in this prospectus, we believe the following accounting policies to be most critical to the judgments and estimates used in the preparation of our financial statements.

#### ***Research and Development Expense***

Research and development costs are expensed as incurred. These expenses include the costs of our proprietary research and development efforts, as well as costs incurred in connection with certain licensing arrangements. Upfront and milestone payments made to third parties in connection with research and development collaborations are expensed as incurred up to the point of regulatory approval. Payments made to third parties upon or subsequent to regulatory approval are capitalized and amortized over the remaining useful life of the related product. We also expense the cost of purchased technology and equipment in the period of purchase if we believe that the technology or equipment has not demonstrated technological feasibility and does not have an alternative future use. Nonrefundable advance payments for goods or services that will be used or rendered for future research and development activities are deferred and are recognized as research and development expense as the related goods are delivered or the related services are performed.

As part of the process of preparing our financial statements, we are required to estimate our accrued research expenses. This process involves reviewing open contracts and purchase orders, communicating with applicable personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of actual cost. The majority of our service providers invoice us monthly in arrears for services performed. We make estimates of our accrued research and

development 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. Examples of estimated accrued research and development expenses include:

- fees paid to contract research organizations in connection with clinical trials;
- fees paid to investigative sites in connection with clinical trials;
- fees paid to contract manufacturers in connection with the production of clinical trial materials; and
- fees paid to vendors in connection with the pre-clinical development activities.

We base our expenses related to research and development and clinical trials on our estimates of the services received and efforts expended pursuant to contracts with multiple third parties, including research institutions and contract research organizations that conduct and manage clinical trials on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. Payments under some of these contracts depend on factors such as the successful enrollment of patients and the completion of clinical trial milestones. In accruing the research and development service fees, we consider the terms of each agreement, the time period over which the services will be performed and the level of effort required to complete the service. If the actual timing of the performance of the services or the level of effort varies from our estimate, we adjust the accrual 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 may result in us reporting amounts that are too high or too low in any particular period. Based on our level of accrued research and development expenses as of September 30, 2014, if our estimates are too high or too low by 5%, this may result in an adjustment to our accrued research and development expenses in future periods of approximately \$0.3 million.

### ***Impairment of Long-Lived Assets***

Long-lived assets, such as property, plant and equipment, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to estimated undiscounted expected future cash flows. If the carrying amount of an asset exceeds its estimated future cash flows, an impairment charge is recognized for the amount by which the carrying amount of the asset exceeds the fair value of the asset. Assets to be sold are no longer depreciated and are reclassified outside of property, plant and equipment at the lower of the carrying amount or fair value less costs to sell.

### ***Stock-Based Compensation***

We issue, and prior to the Spin-Out Ikaria issued, stock-based awards to employees and non-employees in the form of stock options and restricted stock units, or RSUs. The stock-based compensation expense recorded for the periods presented in our audited financial statements, included elsewhere in this prospectus, represents an allocation of Ikaria's stock-based compensation expense for employees and non-employees whose time was attributed to our business prior to the Spin-Out and, as a result, has been allocated to us for accounting purposes.

Ikaria applied, and we apply, the fair value recognition provisions of the Financial Accounting Standards Board, or FASB, Accounting Standards Codification, or ASC, Topic 718, Compensation-Stock Compensation, or ASC 718. ASC 718 requires all stock-based payments to employees, including grants of employee stock options and RSUs and modifications to existing stock options and RSUs, to be recognized in the statements of operations based on their fair values. Ikaria recognized, and we recognize, the compensation expense of stock-based awards on a straight-line basis over the vesting

period of the award for employees and non-employees or sooner if the award is immediately vested. Compensation expense related to stock-based awards is subject to a number of estimates, including the estimated volatility and underlying fair value of our common stock, as well as the estimated life of the awards.

Ikaria estimated, and we estimate, the fair value of stock-based awards to employees and non-employees using the Black-Scholes-Merton option-pricing model, which requires the input of highly subjective assumptions, including (a) the fair value of the underlying stock, (b) the expected volatility of the underlying stock, (c) the expected term of the award, (d) the risk-free interest rate and (e) expected dividends. Due to the lack of a public market for the trading of Ikaria common stock and our equity securities and a lack of company-specific historical and implied volatility data for either company, we and Ikaria based our respective estimates of expected volatility on the historical volatility of a group of similar companies that are publicly traded. For the volatility analyses, we and Ikaria selected companies with comparable characteristics to our respective companies, including enterprise value, risk profile and position within the industry, and with historical share price information sufficient to meet the expected life of the stock-based awards. We and Ikaria computed the historical volatility data using the daily closing prices for the selected companies' shares during the equivalent period of the calculated expected term of our respective stock-based awards. We will apply this process for purposes of our future stock-based compensation expense until a sufficient amount of historical information regarding the volatility of our own stock price becomes available. Because we and Ikaria had minimal historical information to develop expectations about future exercise patterns for our respective stock option grants, in each case, the expected term is based on an average of the expected term of options granted by our respective publicly traded industry peers. The risk-free interest rates for periods within the expected life of the awards are based on the U.S. Treasury yield curve in effect during the period in which the awards were granted.

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

For the periods presented, the weighted average grant date fair value of stock options granted to employees and directors of Ikaria and the weighted average assumptions used by Ikaria to estimate the grant date fair value of the options using the Black-Scholes-Merton option pricing model were:

	2013	2012
Weighted average grant date fair value	\$ 1.95	\$ 2.40
Valuation assumptions:		
Risk-free interest rate	0.90%	0.83%
Expected volatility	46.5%	47.6%
Expected term (in years)	5.00	5.00
Expected dividend yield	—	—

There were no Ikaria options issued during the period from January 1, 2014 through February 11, 2014.

Ikaria has historically granted its stock options at exercise prices not less than the fair value of its common stock. Ikaria was a private company with no active public market for its common stock. Therefore, its board of directors periodically determined for financial reporting purposes the estimated fair value of its common stock using valuations performed in accordance with the guidance outlined in

the American Institute of Certified Public Accountants Practice Aid, *Valuation of Privately Held Company Equity Securities Issued as Compensation*, also known as the Practice Aid.

The compensation expense for the restricted stock units is based on the grant date fair value of the restricted stock unit, which was based on the fair value of the underlying stock.

Prior to the Spin-Out, Ikaria adjusted its outstanding stock options to reflect the Spin-Out. In connection with such adjustment, we issued to certain employees and directors of ours or of Ikaria, as well as certain accredited investors, options to purchase an aggregate of 7,744,480 of our non-voting membership units, at a weighted average exercise price of \$0.58 per unit, which we refer to as the Bellerophon Options. The exercise price of each Bellerophon Option was determined by allocating the exercise price of each outstanding Ikaria stock option held by such individuals to Ikaria and us using a ratio of 85% and 15%, respectively, which reflected the relative value of each entity at the time of the Spin-Out. Each Bellerophon Option has the same expiration date as the corresponding Ikaria stock option. Prior to and in connection with the Spin-Out, we issued to certain employees and directors of ours or of Ikaria and certain accredited investors restricted stock units in respect of an aggregate of 4,672,001 of our non-voting membership units, which we refer to as the Bellerophon RSUs. In connection with the Spin-Out, the vesting of each Bellerophon Option and each Bellerophon RSU was fully accelerated.

Our stock-based compensation expense for periods prior to the Spin-Out represents our allocable portion of Ikaria's stock-based compensation expense for the applicable periods based on the allocation percentages of our cost centers, which were determined based on specific identification or the proportionate percentage of employee time or headcount to the respective total Ikaria employee time or headcount. Our allocable portion of Ikaria's stock-based compensation expense for the years ended December 31, 2013 and 2012, was approximately \$1.7 million and \$1.5 million, respectively. Our allocable portion of Ikaria's stock-based compensation expense for the nine months ended September 30, 2014 and 2013 was approximately \$0.3 million and \$1.5 million, respectively. Because these amounts relate to Ikaria stock-based awards, the amounts presented are not necessarily indicative of our future performance and do not necessarily reflect the stock-based compensation or compensation expense that we would have experienced as a stand-alone company for these periods.

In October 2011, Ikaria approved a special dividend plan, which provided for dividend equivalent rights for options, restricted stock units and other equity awards granted under its equity award plans. Pursuant to the special dividend plan, in the event that Ikaria's board of directors declared a dividend, each employee of Ikaria who held equity awards was eligible to receive a cash payment equal to the amount of the dividend per share, multiplied by the number of equity awards outstanding. The payment was payable as of the declaration date for vested options. For unvested options and unvested restricted stock units, payment was due upon vesting. As of December 31, 2013, the allocated portion of the special dividend bonus payable was \$6.1 million, of which \$1.8 million was reflected in other current liabilities and \$4.3 million was reflected in non-current liabilities. As of December 31, 2012, the allocated portion of the special dividend bonus payable was \$3.6 million, of which \$0.7 million was reflected in other current liabilities and \$2.9 million was reflected in non-current liabilities. The full amount of our allocated portion of the special dividend bonus payable was fully paid on our behalf by Ikaria prior to the Spin-Out.

On June 20, 2014, we granted options to purchase 6,441,718 of our non-voting units with an exercise price of \$1.06 per non-voting unit. As we are a private company with no active public market for our equity securities, the estimated fair value of one of our non-voting units as of June 20, 2014 was determined by our board of directors to be \$1.06. In making this determination, our board of directors used a contemporaneous valuation based on the income approach, performed in accordance with the guidance enumerated in the Practice Aid. For the income approach, we used the discounted cash flow method to estimate the present value of the future monetary benefits expected to flow to the owners of the business. The contemporaneous valuation also considered factors enumerated in Revenue

Ruling 59-60, which serves as a general guideline for the valuation of closely held securities. In addition, we considered all objective and subjective factors that we believe to be relevant to such valuation, including our best estimate of our business condition, prospects and operating performance at the valuation date. Within the contemporaneous valuation performed, a range of factors and assumptions were used. The significant factors, many of them complex and highly subjective, included:

- estimates of our future cash flows and the appropriate discount rate;
- the nature and history of our business enterprise;
- the assessment of key value drivers for our business enterprise;
- the economic outlook in general and the condition and outlook of our industry in particular;
- the financial condition of our business and the book value of our equity interests;
- the likelihood of our achieving a liquidity event; and
- prior sales of equity interests of companies engaged in the same or similar lines of business that have their stocks actively traded in a free and open market.

Once a public trading market for our common stock has been established in connection with the closing of this offering, it will no longer be necessary for our board of directors to estimate the fair value of our common stock in connection with our accounting for granted stock options and/or restricted stock.

### ***Income Taxes***

During the periods presented prior to the Spin-Out, we did not file separate tax returns, as we were included in the tax groupings of other Ikaria entities within the respective entity's tax jurisdiction. As such, the income tax provision included in our financial statements for such periods has been calculated using the separate return method, as if we filed a separate tax return in each of our respective tax jurisdictions.

For financial reporting purposes, we have historically recorded no tax expense or benefit due to our operating loss position. A valuation allowance was established on net deferred tax assets as of periods prior to the Spin-Out because management believed that it was more likely than not that our net deferred tax assets will not be realized.

Deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred tax assets and liabilities are measured using enacted tax rates in effect for the year in which those temporary differences are expected to be recovered or settled. When we became a stand-alone company at the date of the Spin-Out, deferred taxes are no longer recorded. We have elected to be treated as a partnership for tax purposes. Although we are a limited liability company, one of our subsidiaries is a C-corporation and is subject to state and federal income taxes.

We recognize the benefit of an uncertain tax position that we have taken or expect to take on income tax returns prepared under a separate return method if such tax position is more likely than not to be sustained on examination by the taxing authorities, based on the technical merits of the position. These tax benefits are measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate resolution. Unrecognized tax benefits related to net operating loss carryforwards or tax credit carryforwards are presented as a reduction to the related gross deferred tax asset. Unrecognized tax benefits for which a net operating loss carryforward or tax credit carryforward is not available are presented as a liability. A liability for unrecognized tax benefits is classified as non-current unless the liability is expected to be settled in cash within 12 months of the reporting date.

Certain deferred tax assets that arose as a result of Ikaria's past activities and resultant operating losses, such as federal and state net operating loss carryforwards, research and development credit carryforwards and acquired in-process research and development, do not constitute our assets and continued to reside with Ikaria subsequent to the date of the Spin-Out.

### ***Recently Adopted Accounting Standards***

In May 2014, the FASB issued Accounting Standards Update No. 2014-09, or ASU 2014-09, Revenue from Contracts with Customers (Topic 606). ASU 2014-09 supersedes the revenue recognition requirements in Accounting Standards Update No. 2009-13, Revenue Recognition (Topic 605) and requires entities to recognize revenue in a way that depicts the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled to in exchange for those goods or services. ASU 2014-09 is effective for annual reporting periods beginning after December 15, 2016, including interim periods within that reporting period, and is to be applied either retrospectively to each prior reporting period presented or retrospectively with the cumulative effect recognized at the date of initial application. Early application is not permitted. Although the Company does not generate revenues currently, management is in the process of evaluating the potential impact from the adoption of this guidance.

In June 2014, the FASB issued Accounting Standards Update No. 2014-10, or ASU 2014-10, Development Stage Entities (Topic 915): Elimination of Certain Financial Reporting Requirements, Including an Amendment to Variable Interest Entities Guidance in Topic 810, Consolidation. ASU 2014-10 eliminates the distinction of a development stage entity as well as certain related disclosure requirements, including the elimination of inception-to-date information on the statements of operations, members' equity and cash flows. For public business entities, the amendments in ASU 2014-10 are effective prospectively for annual reporting periods beginning after December 15, 2014, and interim periods within those annual periods, and for other entities, the amendments are effective for annual reporting periods beginning after December 15, 2014, and interim reporting periods beginning after December 15, 2015. Early application is permitted. We have adopted ASU 2014-10 for the reporting period ended September 30, 2014.

In June 2014, the FASB issued Accounting Standards Update No. 2014-12 "Compensation—Stock Compensation (Topic 718): Accounting for Share-Based Payments When the Terms of an Award Provide That a Performance Target Could Be Achieved after the Requisite Service Period," or ASU 2014-12. ASU 2014-12 clarifies the proper method of accounting for share-based payments when the terms of an award provide that a performance target could be achieved after the requisite service period. ASU 2014-12 requires that a performance target that affects vesting and that could be achieved after the requisite service period be treated as a performance condition. The performance target should not be reflected in estimating the grant-date fair value of the award. Compensation cost should be recognized in the period in which it becomes probable that the performance target will be achieved and should represent the compensation cost attributable to the period(s) for which the requisite service has already been rendered. The amendments in ASU 2014-12 are effective for annual periods and interim periods within those annual periods beginning after December 15, 2015. Earlier adoption is permitted. We will adopt this guidance if and when we issue share-based awards with performance targets.

In August 2014, the FASB issued Accounting Standards Update No. 2014-15—"Presentation of Financial Statements—Going Concern (Subtopic 205-40): Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern," or ASU No. 2014-15. ASU No. 2014-15 should reduce diversity in the timing and content of footnote disclosures. ASU No. 2014-15 requires management to assess an entity's ability to continue as a going concern by incorporating and expanding upon certain principles that are currently in U.S. auditing standards. Specifically, it (1) provides a definition of the term substantial doubt, (2) requires an evaluation every reporting period including interim periods, (3) provides principles for considering the mitigating effect of management's plans, (4) requires certain disclosures when substantial doubt is alleviated as a result of consideration of management's plans,

(5) requires an express statement and other disclosures when substantial doubt is not alleviated, and (6) requires an assessment for a period of one year after the date that the financial statements are issued (or available to be issued). The amendments in ASU No. 2014-15 are effective for the annual period ending after December 15, 2016, and for annual periods and interim periods thereafter. Early application is permitted. We are currently evaluating the impact the adoption of ASU No. 2014-15 will have on our financial statements.

### **Quantitative and Qualitative Disclosure About Market Risk**

We are exposed to market risk related to changes in interest rates. As of September 30, 2014, we had cash, cash equivalents and restricted cash of approximately \$43.7 million, consisting primarily of demand deposits with U.S. banking institutions. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates, particularly because our investments are in cash and cash equivalents. Due to the short-term duration of our deposits and the low risk profile of our investments, an immediate 10% change in interest rates would not have a material effect on the fair market value of our deposits.

### **JOBS Act**

We qualify as an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. As an emerging growth company, we may take advantage of specified reduced disclosure and other requirements that are otherwise applicable generally to public companies. These provisions include:

- only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure;
- reduced disclosure about our executive compensation arrangements;
- exemption from the non-binding advisory votes on executive compensation, including golden parachute arrangements; and
- exemption from the auditor attestation requirement in the assessment of our internal controls over financial reporting.

Generally, we may take advantage of these exemptions for up to five years or such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company if we have more than \$1.0 billion in annual revenue, we have more than \$700.0 million in market value of our stock held by non-affiliates or we issue more than \$1.0 billion of non-convertible debt over a three-year period. We may choose to take advantage of some, but not all, of the available exemptions. We have taken advantage of certain reduced reporting burdens in this prospectus. Accordingly, the information contained herein may be different than the information you receive from other public companies in which you hold stock.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.





## BUSINESS

### Overview

We are a clinical-stage therapeutics company focused on developing innovative products at the intersection of drugs and devices that address significant unmet medical needs in the treatment of cardiopulmonary and cardiac diseases. We have two programs in advanced clinical development. The first program, INOpulse, is based on our proprietary pulsatile nitric oxide delivery device. We are currently developing two product candidates under our INOpulse program: one for the treatment of pulmonary arterial hypertension, or PAH, for which we intend to commence Phase 3 clinical trials in the second half of 2015, and the other for the treatment of pulmonary hypertension associated with chronic obstructive pulmonary disease, or PH-COPD, which is in Phase 2 development. Our second program is bioabsorbable cardiac matrix, or BCM, which is currently in a placebo-controlled clinical trial designed to support CE mark registration in the European Union. Enrollment of this trial is almost complete with more than 290 out of 306 patients enrolled, as of November 15, 2014. Assuming positive results from this trial, we intend to conduct a pivotal pre-market approval trial of BCM beginning in the first half of 2016, which will be designed to support registration in the United States. We are developing BCM for the prevention of cardiac remodeling, which often leads to congestive heart failure following an ST-segment elevated myocardial infarction, or STEMI.

### Our Product Candidates

The following table summarizes key information about our development programs and product candidates. We have worldwide commercialization rights to all of our product candidates.

PROGRAMS	INDICATION		PHASE 1	PHASE 2	PHASE 3	UPCOMING MILESTONE
INOpulse	PAH					• Phase 3 clinical trial expected to start in second half of 2015
	PH-COPD					• Phase 2b clinical trial expected to start in second half of 2015
PROGRAMS	INDICATION	REGION	PILOT	FEASIBILITY	PIVOTAL	UPCOMING MILESTONE
BCM*	Prevention of Congestive Heart Failure	EU				• Trial results expected mid-2015
		US				

\* We are currently conducting a single clinical trial for BCM that, if positive, we plan to use as a CE mark registration trial in the European Union and following which we would conduct a second, larger clinical trial to support registration in the United States.

From the inception of our business through September 30, 2014, \$184.3 million was invested in our development programs. To date, our sole source of funding has been investments in us by our former parent company, Ikaria.

### INOpulse

Our INOpulse program is an extension of the technology used in hospitals to deliver continuous-flow inhaled nitric oxide. Use of inhaled nitric oxide is approved by the U.S. Food and Drug Administration, or the FDA, and certain other regulatory authorities to treat persistent pulmonary hypertension of the newborn. Ikaria, Inc., or Ikaria, has marketed continuous-flow inhaled nitric oxide as INOmax for hospital use in this indication since approval in 1999. In October 2013, Ikaria transferred to us exclusive worldwide rights to develop and commercialize pulsed nitric oxide in



PAH, PH-COPD and pulmonary hypertension associated with idiopathic pulmonary fibrosis, or PH-IPF, with no royalty obligations. Our INOpulse program is built on scientific and technical expertise developed for the therapeutic delivery of inhaled nitric oxide. In 2010, Ikaria filed an investigational new drug application, or IND, for INOpulse for the treatment of patients with PAH, which is a form of pulmonary hypertension that is closely related to persistent pulmonary hypertension of the newborn. In 2012, Ikaria filed a second IND for INOpulse for the treatment of patients with PH-COPD. These INDs were included in the assets that were transferred to us by Ikaria.

Nitric oxide is naturally produced and released by the lining of the blood vessel and results in vascular smooth muscle relaxation, an important factor in regulating blood pressure. As the muscles of the blood vessels relax, this allows the heart to increase blood flow to tissues and organs of the body, including the lung. When administered through inhalation, nitric oxide acts to selectively reduce pulmonary arterial pressure in the lung with minimal effects on blood pressure outside of the lungs, an important safety consideration.

Inhaled nitric oxide is widely used in the hospital setting for the treatment of a variety of conditions and, as reported by Ikaria, over 450,000 patients have been treated with inhaled nitric oxide worldwide since its first such use. However, chronic outpatient use of this therapy has previously been limited by a lack of a safe and compact delivery system for outpatient use. We have designed our INOpulse device, which is the means by which inhaled nitric oxide is delivered to the patient, to be portable, which enables use by ambulatory patients on a daily basis inside or outside their homes. Our INOpulse device has a proprietary mechanism that delivers brief, targeted pulses of nitric oxide timed to occur at the beginning of a breath for delivery to the well-ventilated alveoli of the lungs, which minimizes the amount of drug required for treatment. We estimate this, and the higher concentration of nitric oxide we use, reduces the volume of drug delivered to approximately 5% of the volume required for equivalent alveolar absorption using standard continuous flow delivery systems, and also reduces the amount of nitric oxide, as well as its by-product nitrogen dioxide, that is exhaled and released into the patient's environment. INOpulse is designed to automatically adjust nitric oxide delivery based on a patient's breathing pattern to deliver a constant and appropriate dose of the inhaled nitric oxide over time, independent of the patient's activity level, thus ensuring more consistent dosing of the nitric oxide to the alveoli of the lungs.

In our recently completed INOpulse clinical trials, we used the first generation INOpulse device, which we refer to as the INOpulse DS device. In future clinical trials, we intend to use our second generation device, which we refer to as the Mark2. The Mark2 has approximately the same dimensions as a paperback book and weighs approximately 2.5 pounds. The Mark2 has a simple and intuitive user interface and a battery life of approximately 24 hours when recharged, which takes approximately four hours and can be done while the patient sleeps. Based on the doses we have evaluated in our clinical trials, we expect that the cartridge will need to be replaced once a day. In addition, we have developed a triple-lumen nasal cannula, which forms part of the Mark2 and enables more accurate dosing of nitric oxide and minimizes infiltration of oxygen, which can react with nitric oxide to form nitrogen dioxide. Our triple-lumen nasal cannula consists of a thin, plastic tube that is divided into three channels from end-to-end, including at the prongs that are placed in the patient's nostrils, with one channel delivering inhaled nitric oxide, a second for breath detection and a third available for oxygen delivery. INOpulse is designed to be compatible with many long-term oxygen therapy systems. In the usability research we conducted, all eight patients with experience with the INOpulse DS device responded positively to the Mark2, and several of these patients indicated that the ability to take the Mark2 outside the home would likely reduce concerns with maintaining compliance.

Our technology is based on patents we have exclusively licensed from Ikaria for the treatment of PAH, PH-COPD and PH-IPF. These include patents with respect to the pulsed delivery of nitric oxide to ensure a consistent dose over time, which expire as late as 2027 in the United States and as late as 2026 in certain other countries, as well as with respect to the special triple-lumen cannula that allows

for safer and more accurate dosing of pulsed nitric oxide, which expires in 2033. We have also licensed several other patent applications from Ikaria for certain of the innovations included in the Mark2 and certain of the resulting patents, if issued, would expire as late as 2033.

#### *INOpulse for PAH*

We are developing INOpulse for the treatment of PAH to address a significant and unmet medical need in an orphan disease, which is a disease that affects fewer than 200,000 individuals in the United States. This program represents a potential first-in-class therapy for this indication. In October 2014, we completed a randomized, placebo-controlled, double-blind Phase 2 clinical trial of INOpulse for PAH. The data from this trial showed trends toward lower pulmonary vascular resistance in both active arms compared to placebo and a slight trend toward increased six-minute walk distance in the higher dose group. While neither of these results reached the threshold for statistical significance, additional exploratory analyses of patients who were compliant with therapy, assessed as being on therapy for greater than 12 hours per day, as well as a similar analysis of patients on long-term oxygen therapy, or LTOT, showed clinically meaningful and statistically significant improvements in both the primary endpoint of pulmonary vascular resistance and the key secondary endpoint of six-minute walk distance, relative to placebo, for patients on the higher dose. These two sub groups each comprised more than 50% of the total patients enrolled in the trial.

We believe the results of this trial provide sufficient indication of efficacy and safety to continue development of INOpulse for PAH in pivotal Phase 3 clinical trials, the primary endpoints of which will be tied to functional capacity for patients with PAH. We have an End of Phase 2 meeting scheduled with the FDA in January 2015 to discuss this plan. We intend to finalize our plans for this product candidate, including for clinical trial design, following this meeting as well as following additional discussions with regulatory authorities, including the European Medicines Agency, or EMA. Currently, we intend to begin Phase 3 clinical trials in the second half of 2015.

The FDA has granted orphan drug designation to our nitric oxide program for the treatment of PAH. If a product with an orphan drug designation is the first to receive FDA approval, the FDA will not approve another product for the same indication that uses the same active ingredient for seven years, unless the other product is shown to be clinically superior.

PAH is characterized by abnormal constriction of the arteries in the lung that increases the blood pressure in the lungs which, in turn, results in abnormal strain on the heart's right ventricle, eventually leading to heart failure. While prevalence data varies widely, we estimate there are a total of at least 35,000 patients currently diagnosed with and treated for PAH in the United States and European Union. Moreover, because PAH is rare and causes varied symptoms, we believe there is significant under-diagnosis of the condition at its early stages. There are several approved therapies for PAH, and we estimate, based on public product sales data, that 2012 combined global sales for these therapies were over \$4.0 billion. Most PAH patients are treated with multiple medications and many are on supportive therapy, including approximately 40% who are treated with LTOT. Despite the availability of multiple therapies for this condition, PAH continues to be a life-threatening, progressive disorder. A French registry initiated in 2002 and a U.S. registry initiated in 2006 estimate that the median survival of patients with PAH is three and five years from initial diagnosis, respectively.

#### *INOpulse for PH-COPD*

We are also developing INOpulse for the treatment of PH-COPD. The data from an initial three-month, open-label chronic-use Phase 2 trial conducted by a third party, which we in-licensed, showed that pulsed inhaled nitric oxide significantly reduced pulmonary arterial pressures in PH-COPD patients on LTOT and did so without causing hypoxemia, or an abnormally low level of oxygen in the blood, which is a significant concern for these patients. In June 2012, Ikaria submitted the data from this trial

to the FDA as part of the IND package for INOpulse for PH-COPD. Based on discussions with the FDA, we believe this trial is an adequate Phase 2 trial. The FDA asked us to confirm the dose range and the safety related to hypoxemia in PH-COPD patients using the INOpulse device, prior to proceeding to large scale trials. Following this guidance, we conducted a Phase 2 acute dose ranging trial with the INOpulse DS device. This trial, which we completed in July 2014, identified a dose range that showed similar reduction in pulmonary arterial pressure versus baseline when compared to the initial acute effects of pulsed inhaled nitric oxide in the original chronic-use trial. In addition, in our confirmatory trial, none of the INOpulse doses tested had an adverse effect on hypoxemia relative to placebo. While the reduction in pulmonary arterial pressure did not reach statistical significance versus placebo in this acute setting, which was the primary endpoint of the trial, we believe that the results have confirmed a dose range for this therapy that delivers a significant reduction in pulmonary arterial pressure versus baseline and does not cause hypoxemia in patients with PH-COPD. We are currently evaluating our trial design for chronic use in this population in a Phase 2b trial and plan to finalize the protocol following discussions with regulatory authorities in the United States and European Union.

COPD is a disease characterized by progressive and persistent airflow limitations. Patients with more severe COPD frequently have hypoxemia and may be treated with LTOT. Despite treatment with oxygen, hypoxemia can progress and contribute to pulmonary hypertension. In 2010, Datamonitor estimated that over 1.4 million COPD patients in the United States were being treated with LTOT. Based on academic studies, we estimate that 50% of COPD patients on LTOT have pulmonary hypertension. PH-COPD patients have a lower median life expectancy and a higher rate of hospitalization than COPD patients with similar respiratory disease but without pulmonary hypertension. Currently, there are no approved therapies for treating PH-COPD, and the only generally accepted treatments are LTOT, pulmonary rehabilitation and lung transplant.

## **BCM**

Our second program, BCM, is a medical device intended to prevent congestive heart failure following an ST-segment elevated myocardial infarction, or STEMI, which is a type of severe heart attack. Patients who suffer a STEMI are at an increased risk for congestive heart failure due to potential cardiac remodeling, which is a structural change in the size and shape of the heart that affects its ability to function normally.

BCM is delivered during a minimally invasive, commonly performed cardiac procedure called a percutaneous coronary intervention procedure. BCM is a formulated sterile solution of sodium alginate and calcium gluconate designed to be administered as a liquid through the coronary artery. When administered following a STEMI, BCM flows into damaged heart muscle where, in the presence of abnormally high extracellular calcium released by the damaged cells, it forms a protective hydrogel meshwork within the wall of the heart's left ventricle. Based on pre-clinical animal studies, we believe that BCM has the potential to act as a flexible scaffold to provide physical support to the ventricle wall in the early stages of recovery following a STEMI and prevent further structural damage while the heart muscle heals. In addition, in our pre-clinical animal studies, as calcium levels in the damaged area returned to normal, BCM dissolved and was excreted through normal kidney function.

In a 27-patient pilot clinical trial conducted in 2009, BCM was safely administered within seven days following a STEMI. Patients showed no deterioration from baseline of important measures of left ventricular function at one, three and six month measurements. Follow-up safety data for these patients, which was obtained four years after the completion of the pilot clinical trial, showed one death from T-cell lymphoma—likely a preexisting condition—and one hospitalization from congestive heart failure. One patient was lost to follow-up in year four, but this patient had no device related adverse events through the three-year evaluation. These results were below the incidence of adverse events of approximately 25% to 30% we expected for patients following an acute myocardial infarction,

or AMI, commonly known as a heart attack. This expectation was based on our review of publicly reported data from two long-term third-party studies of AMI patients.

We initiated a clinical trial of BCM in December 2011 and enrolled the first patient in April 2012. Enrollment of this trial is almost complete with more than 290 out of 306 patients enrolled and with the device deployed at almost 90 clinical sites in Europe, Australia, North America and Israel, as of November 15, 2014. We expect to report top line results in mid-2015, following a six-month follow-up period for all patients. This trial is a CE mark registration trial in the European Union. If the results of this trial are positive, we expect it would form the basis for our application for CE marking in the European Union and we would expect to conduct a second, larger clinical trial to support approval in the United States through the premarket approval, or PMA, pathway.

In the United States, we are developing BCM under an investigational device exemption, or IDE. We sponsored an IDE application for our ongoing feasibility clinical trial of BCM to prevent ventricular remodeling and heart failure in patients who are at high risk for ventricular remodeling after an AMI and a successful percutaneous coronary intervention. The FDA has designated BCM as a Class III device. Class III devices are those which the FDA deems to pose the greatest risk, such as those that are life sustaining or life supporting. As a result, the FDA regulates Class III devices under the most rigorous device approval pathway, the PMA process. Device approval under the PMA pathway must be supported by extensive data, including from pre-clinical studies and clinical trials, that demonstrate the safety and efficacy of the device for its intended use. In August 2013, the FDA confirmed that no additional pre-clinical studies were required to support a PMA application. Assuming positive results from this trial, we intend to conduct a pivotal pre-market approval trial of BCM beginning in the first half of 2016, which will be designed to support registration in the United States.

We have an exclusive worldwide license to BCM from BioLineRx Ltd. and its subsidiary, or BioLine, including with respect to issued composition of matter patents on BCM that expire as late as 2029 in the United States, with a possible patent term extension to 2032 to 2034 depending on the timing of marketing approval and other factors, and 2024 in certain other countries. We licensed this product candidate in 2009, following completion of the 27-patient pilot clinical trial conducted by BioLineRx Ltd.

Data from the American Heart Association and the European Association for Percutaneous Cardiovascular Interventions suggests that a total of over 1,900,000 patients suffer a heart attack in the United States and European Union each year, with at least 750,000 of these patients having a STEMI. Following a STEMI, patients are at increased risk of developing cardiac remodeling and subsequent congestive heart failure, and data from long-term third-party studies suggest that the five-year post-AMI rate of congestive heart failure or death is approximately 35% to 40%.

## Our Strategy

Our goal is to become a leader in developing and commercializing innovative products at the intersection of drugs and devices that address significant unmet medical needs in the treatment of cardiopulmonary and cardiac diseases. The key elements of our strategy to achieve this goal include:

- *Advance the clinical development of INOpulse.* One of our lead product candidates is INOpulse for PAH. Based on the results from our recently completed Phase 2 clinical trial in PAH, we intend to initiate a Phase 3 clinical trial for this indication in the second half of 2015. In addition, we believe the results of the PH-COPD clinical trials support continued Phase 2 development and we plan to evaluate our options for further development, including potentially through partnerships.

- *Advance the clinical development of BCM in the prevention of cardiac remodeling following a STEMI.* One of our other lead product candidates is BCM. Assuming positive results from our ongoing clinical trial, we expect to file for CE marking in the European Union in the second half of 2015 and to initiate a pivotal trial in early 2016 to support a PMA submission seeking marketing approval in the United States.
- *Leverage our historical core competencies to expand our pipeline.* We have years of institutional experience in the use of inhaled nitric oxide in treating pulmonary hypertension and in the development of drug-device combination product candidates. If we successfully advance INOpulse for the two product candidates we are currently developing, we expect to develop INOpulse for treatment of PH-IPF and, subject to obtaining additional license rights from Ikaria, potentially other outpatient pulmonary hypertension indications. Our longer-term vision is to identify and opportunistically in-license innovative therapies that are at the intersection of drugs and devices and to develop and commercialize these product candidates.
- *Build commercial infrastructure in select markets.* As we near completion of the development of our product candidates, we expect to build a commercial infrastructure to enable us to market and sell certain of our product candidates with a specialized sales force and to retain co-promotion or similar rights, when feasible, in indications requiring a larger commercial infrastructure. While we may partner with third parties to commercialize our product candidates in certain countries, we may also choose to establish commercialization capabilities in select countries outside the United States.

## INOpulse

### INOpulse Scientific Background

Nitric oxide is a naturally occurring molecule produced by many cells of the body. Researchers found that nitric oxide is produced and released by the lining of the blood vessel and plays a role in controlling muscle tone in blood vessels. In particular, nitric oxide results in vascular smooth muscle relaxation in blood vessels and thus is an important factor in regulating blood pressure. As the muscles of the blood vessels relax, blood flow increases, helping the heart to deliver more blood to the body. When administered by inhalation to patients with pulmonary hypertension, we expect inhaled nitric oxide to act in a similar manner to naturally produced nitric oxide.

The scientific journal *Science* named nitric oxide Molecule of the Year in 1992. Additionally, the three researchers who discovered the role of nitric oxide as a signaling molecule in the cardiovascular system earned the Nobel Prize for Physiology or Medicine in 1998.

In 1991, Dr. Warren Zapol and his associates at the Massachusetts General Hospital discovered that inhaling nitric oxide in gas form could reduce high blood pressure in the lungs, a condition known as pulmonary hypertension. Nitric oxide is a rapid and potent vasodilator, which means it dilates, or widens, blood vessels. When inhaled, it quickly dilates blood vessels in the lungs, which reduces blood pressure in the lungs, strain on the right ventricle and shunting of de-oxygenated blood away from the lungs. Because more blood can flow through the lungs, blood levels of oxygen improve. In addition, inhaled nitric oxide improves the efficiency of oxygen delivery, and because it is a gas, it goes only to the portions of the lung that are ventilated, or receiving air flow, and increases blood flow only in these areas. Thus, inhaled nitric oxide improves ventilation-perfusion matching, an important element of lung function involving the air that reaches the lungs, or ventilation, and the blood that reaches the lungs, or perfusion. Inhaled nitric oxide is quickly inactivated after contact with blood, and is selective for the lungs, meaning that it has minimal effects on blood pressure outside of the lungs, which is an important safety consideration.

In 1999, the FDA approved the use of inhaled nitric oxide for the short-term treatment of persistent pulmonary hypertension of the newborn. Based on this approval, and similar approvals from foreign regulatory authorities, continuous-flow inhaled nitric oxide, which is administered to ventilated patients by a dedicated in-hospital device, is marketed by Ikaria and its commercialization partners worldwide as INOmax (INOflo in Japan). Inhaled nitric oxide is widely used in the hospital setting for a variety of conditions and, as reported by Ikaria, over 450,000 patients have been treated with inhaled nitric oxide worldwide since its commercial launch. However, chronic outpatient use of this therapy has previously been limited by the lack of a safe and compact delivery system for outpatient use.

### ***INOpulse Drug-Device Combination***

Our INOpulse device has a proprietary mechanism that delivers brief, targeted pulses of nitric oxide, timed to occur at the beginning of a breath and targeted for delivery to the well-ventilated alveoli of the lungs. INOpulse is portable and therefore allows for treatment of ambulatory patients on a daily basis inside or outside their homes. INOpulse is designed to automatically adapt based on a patient's breathing pattern to deliver a constant dose of the drug over time, independent of the patient's activity level, thus ensuring predictable dosing in the alveoli of the lungs. We estimate that, because of the pulsed delivery and higher concentration of nitric oxide we use, the volume of drug delivered is reduced to approximately 5% of the volume required for equivalent alveolar absorption using standard continuous-flow delivery systems.

INOpulse is configured to be highly portable and compatible with available modes of long-term oxygen therapy via nasal cannula delivery. Our recently completed clinical trials of INOpulse for PAH and INOpulse for PH-COPD utilized the first generation INOpulse DS device, which is derived from an older hospital-based system. While this device is portable and appropriate for use at home, to make INOpulse acceptable to a broader range of patients and to improve its usability, we are near completion of the second generation device, which we refer to as the Mark2, which we plan to use in future clinical trials.

The Mark2 is approximately the size of a paperback book and weighs approximately 2.5 pounds. It has a simple user interface and a battery life of approximately 24 hours when recharged, which takes approximately four hours and can be done while the patient sleeps. Based on the doses we evaluated in our clinical trials, we expect the cartridge will need to be replaced once a day. The Mark2 incorporates our proprietary triple-lumen nasal cannula, safety systems and proprietary software algorithms. The triple-lumen nasal cannula enables more accurate dosing of inhaled nitric oxide and minimizes infiltration of oxygen, which can react with nitric oxide to form nitrogen dioxide. Our triple-lumen nasal cannula consists of a thin, plastic tube that is divided into three channels from end-to-end including at the prongs that are placed in the patient's nostrils, with one channel delivering inhaled nitric oxide, a second for breath detection and a third available for oxygen delivery. Our device is designed to be compatible with many long-term oxygen therapy systems.

The Mark2 has been well received by patients in the usability research we have conducted. In addition to the baseline testing on the original INOpulse DS device, we have conducted two rounds of testing with COPD and PAH patients to evaluate the user interface, loading mechanism, size, carrying bag and other features. In the usability research we have conducted, all eight patients with experience with the INOpulse DS device responded positively to the Mark2, and several of these patients indicated that the ability to take the Mark2 outside the home would likely reduce concerns with maintaining compliance.

Based on discussions with the FDA, we are required to show that the amount and timing of inhaled nitric oxide delivery is similar across INOpulse device generations. We have developed a regulatory bridging strategy to meet these requirements. To facilitate the transition from our existing INOpulse DS device to the Mark2 in our INOpulse clinical program, we plan to conduct comparability

testing of inhaled nitric oxide dosing with the Mark2 as compared to the INOpulse DS device. This testing will include a comparison of critical parameters, including pulse width and nitric oxide output. We will also assess whether the Mark2 will meet the performance specifications of the INOpulse DS device in addition to Mark2-specific requirements. In addition, we are developing a bridging test report that we expect to include in the regulatory package that we anticipate submitting to the FDA during the first quarter of 2015 to gain approval for the device transition. We discussed our bridging strategy with the FDA during a meeting in May 2013, and we believe that, assuming the Mark2 meets the specified comparability parameters, this testing will be sufficient to gain FDA approval to use the Mark2 in future clinical trials, as planned.

We have licensed from Ikaria several patent applications for certain innovations in our INOpulse devices. These include patents with respect to the pulsed delivery of inhaled nitric oxide to ensure a consistent dose over time, which expire as late as 2027 in the United States and as late as 2026 in certain other countries, as well as patents with respect to the triple-lumen cannula that allows for safer and more accurate dosing of pulsed inhaled nitric oxide, which expires in 2033. We have also licensed several other patent applications from Ikaria for certain of the innovations included in the Mark2 and certain of the resulting patents that, if issued, would expire as late as 2033.

In the European Union, where there is no formal drug-device designation, we expect INOpulse to be evaluated by the EMA as a drug with specific reference in the label to the device and cannula, which will require a separate CE mark from a Notified Body.

### ***Introduction to Pulmonary Hypertension***

Pulmonary hypertension is a disease characterized by constriction of the blood vessels in the lung, which causes blood pressure in the lung to rise and, in turn, increases the work required for the right ventricle of the heart to pump blood. The World Health Organization, or WHO, has endorsed a consensus classification for pulmonary hypertension that was updated most recently in 2013. The WHO classification has five broad pulmonary hypertension groups based on similarities in pathological and hemodynamic characteristics and therapeutic approaches. We are initially focusing development of INOpulse in indications included in WHO Groups 1 and 3 due to our view of the likelihood of success and the size and commercial viability of these markets. Group 1 pulmonary hypertension is comprised of patients with pulmonary arterial hypertension and is referred to as PAH. This Group combines conditions with a range of causes, all of which have a characteristic pattern of vascular remodeling. The constriction of the blood vessels and the resulting pressure on the heart is often the major reason for poor prognosis of PAH patients since they can be otherwise healthy. Most PAH-specific medications are vasodilators and work through one of the three key mechanistic pathways for vasoconstriction and vasodilation. We expect that, because inhaled nitric oxide is a vasodilator, patients in Group 1 will benefit from INOpulse. Group 3 pulmonary hypertension consists of pulmonary hypertension associated with lung disease or hypoxemia, which is an abnormally low level of oxygen in the blood. This Group includes patients with PH-COPD and PH-IPF, among others.

### ***INOpulse for Pulmonary Arterial Hypertension***

We are developing INOpulse for PAH to address a significant and unmet medical need in an orphan disease. This product candidate represents the development of a potential first-in-class therapy for this indication. Although current therapy for PAH provides some therapeutic benefit, there remains no cure, and approved therapies can have significant systemic side effects, such as hypotension and liver injury. INOpulse for PAH is designed to be a selective, short-acting pulmonary vasodilator and is being tested as an add-on therapy to existing PAH medications to evaluate its efficacy and side effect profile, in particular its ability to provide clinical benefit without adding to the systemic effects such as hypotension.

*Disease Background and Market Opportunity*

PAH is a life-threatening, progressive disorder characterized by abnormally high blood pressure, or hypertension, in the pulmonary artery, the blood vessel that carries blood from the heart to the lungs. PAH occurs when most of the very small arteries, or arterioles, throughout the lungs narrow in diameter, which increases the resistance to blood flow through the lungs. To overcome the increased resistance, pressure increases in the pulmonary artery and the right ventricle, which is the heart chamber that pumps blood into the pulmonary artery. In addition, PAH may cause changes to the blood vessel lining that hinder the natural production of nitric oxide. Signs and symptoms of PAH occur when this increased pressure in the right ventricle cannot fully overcome the elevated resistance.

There are a number of drugs approved for the treatment of PAH that work primarily by reducing pulmonary vascular resistance, which is the primary problem for these patients. However, despite the availability of multiple therapies for this condition, the mortality rate for PAH remains high, with estimates of median survival ranging from three to five years. Patients with PAH also report severe impairment of health-related quality of life, including poor general and emotional health and impaired physical functioning. The most common symptoms of PAH are shortness of breath during exertion and fainting spells. People with PAH may experience additional symptoms, particularly as the condition worsens, including dizziness, swelling of the ankles or legs, chest pain and a racing pulse. These impairments to health-related quality of life are comparable and sometimes more severe than those reported in patients with severely debilitating conditions such as spinal cord injury.

Since PAH is an orphan condition with poor diagnosis rates, published prevalence estimates for PAH vary widely. Based on epidemiological studies and current treatment rates, we estimate that there are a total of at least 35,000 patients currently diagnosed and treated for PAH in the United States and European Union. The average age of PAH patients at diagnosis is approximately 50 years, and approximately 80% of PAH patients are female. PAH is often diagnosed late in the disease progression with approximately 73% of these patients already having progressed to WHO functional Class III or IV at the time of diagnosis.

PAH is characterized by abnormal constriction of the arteries in the lung. PAH patients are generally treated with one or more of the four major classes of approved medications, which are prostacyclin and prostacyclin analogs, phosphodiesterase type-5 inhibitors, endothelin receptor antagonists and a soluble guanylate cyclase stimulator, all of which potentially result in vasodilatory systemic effects and, therefore, hypotension. Current guidelines recommend treatment with multiple medications in Class III and IV patients with progressive disease but suggest treatment be carefully managed by experienced physicians. Approximately 45% of PAH patients are treated with more than one class of medication at a given time. In addition, since hypoxemia can be a problem in these patients, it is often treated with long-term oxygen therapy in accordance with broadly supported treatment guidelines in the United States and European Union.

We are testing INOpulse for PAH as an add-on therapy for use in patients whose disease is progressing and who use additional medications. If it is approved, we expect INOpulse will provide the greatest benefit to patients who require pulmonary arterial pressure reductions beyond the reductions achieved with the medication they are already using and who are also at risk for systemic hypotension. Because of its localized effect and short-half life, we do not expect INOpulse will add to systemic blood pressure reductions of other PAH drugs. We believe that INOpulse is also likely to be preferentially prescribed for patients already on LTOT. Data from a U.S. and a French registry indicate that approximately 40% of patients are treated with oxygen at diagnosis for hypoxemia. Approximately 60% of the patients from our recently completed Phase 2 clinical trial were on LTOT. We believe that, as compared to patients who are not using a nasal cannula, patients who are accustomed to using a nasal cannula for delivery of oxygen are more likely to be prescribed and are more likely to be compliant with the use of INOpulse.

A 2013 report by CVS Caremark Specialty Analytics provided examples of PAH medications with annual prices ranging from \$96,000 to \$162,000 per year in the United States. We expect that, if approved, the price of INOpulse will be in the range of other established PAH medications.



*Scientific Rationale for Use of INOpulse for PAH*

Since the discovery of the significant role of nitric oxide in vasodilation, there has been an expectation in the scientific community that inhaled nitric oxide could be an effective therapy for PAH. According to the Cleveland Clinic Center for Continuing Education section on Pulmonary Hypertension, exogenous administration of nitric oxide by inhalation is probably the most effective and specific therapy for PAH, but cost and technical complexity of delivering inhaled nitric oxide have limited its use to the hospital. Although not approved for the treatment of PAH, data from an in-hospital survey conducted by Ikaria showed an estimated 1,000 to 2,000 INOmax uses in PAH patients in the United States each year, indicating that physicians already use nitric oxide in some PAH patients. The difficulty in delivering inhaled nitric oxide outside of the hospital results from the size of the device and cylinder and the need for a specialized delivery system with built-in safety systems.

We are developing nitric oxide for treatment of PAH because nitric oxide is a proven vasodilator, and PAH is primarily a disease of high pulmonary vascular resistance. PAH is associated with impaired release of nitric oxide and thus we believe chronic administration of inhaled nitric oxide may be viewed as an adjunctive or replacement therapy in patients with PAH. The use of inhaled nitric oxide in PAH has been proposed since the role of nitric oxide in this disease was identified. This drug has been tested in limited investigational studies conducted at academic institutions.

One clinical trial conducted at an academic center in Spain in 11 patients with severe Group 1 or Group 4 pulmonary hypertension evaluated the use of pulsed inhaled nitric oxide in an ambulatory setting. In this open-label, single-arm trial with no placebo control, patients were given ambulatory pulsed inhaled nitric oxide therapy via a nasal cannula for up to one year, after being withdrawn from PAH-specific therapy. The nitric oxide pulse was delivered to the patient at the beginning of each inspiration at a flow rate that was individualized for such patient. The goal of this trial was to evaluate the efficacy and safety of long-term treatment with inhaled nitric oxide outside the hospital setting.

At the start of this trial, patients were evaluated for various measures including the distance they were able to walk in six minutes and WHO functional class. At baseline, most of these patients had significant impairment of six-minute walk distance, with the ability to walk an average of 125 meters, and poor WHO functional class status, with nine patients in Class IV and two patients in Class III. After one month of therapy, overall, patients improved based on WHO functional class, with six patients in Class III and five in Class II, and had improvements in six-minute walk distance of 128 meters on average. After six months of treatment, patients did not worsen clinically, however, between months six and 12, seven patients were given a phosphodiesterase type-5 inhibitor due to clinical worsening. One patient who initially did well with the added phosphodiesterase type-5 inhibitor therapy developed severe right heart failure at month eight and died, and another patient received a lung transplant at month nine. The remaining nine patients all had clinical status at month 12 similar to their one month evaluation and maintained their six-minute walk distance improvements seen at one month.

We do not expect INOpulse to have systemic effects beyond the pulmonary vasculature because of the short half-life of nitric oxide combined with its targeted delivery to the alveoli. When nitric oxide is delivered as a pulse at the beginning of inhalation, it travels to the alveoli where it diffuses rapidly across the alveolar capillary membrane into the adjacent vascular smooth muscle of pulmonary vessels. This transport is similar to the natural transport of endogenous nitric oxide from the endothelial cells, where it is produced, to the vascular smooth muscle cells where it relaxes the muscle and causes vasodilation of the pulmonary arteries. We believe this makes INOpulse unlikely to have intolerable side effects, such as systemic hypotension or drug-drug interactions. Given the need for PAH patients to be treated with multiple therapies and the potential for increased hypotension from each of the currently approved PAH therapies, we are developing INOpulse as an add-on or adjunctive therapy for PAH, where we believe it has the highest commercial potential.

*Clinical Development Program*

INOpulse for PAH is designated as a drug-device combination by the FDA and is being evaluated through the Division of Cardiovascular and Renal Products of the Center for Drug Evaluation and Research with consultation from the Center for Devices and Radiological Health. For our IND for PAH, we submitted data from animal studies in rats and sheep as well as the results of a Phase 1 trial of pulsed, inhaled nitric oxide in normal volunteers. In addition, we referenced additional data from Ikaria's new drug application, or NDA, in respect of INOmax. Based on this, the FDA has agreed that no further preclinical studies are required for clinical development of INOpulse for PAH.

In the European Union, where there is no formal drug-device designation, we expect that INOpulse for PAH will be evaluated by the EMA as a drug with specific reference in the label to the device and cannula, which will require a separate CE mark from a Notified Body.

We are currently conducting a Phase 2 clinical trial of INOpulse for PAH in the United States and Canada. Our key inclusion criteria for patients in this trial were that they:

- be diagnosed with pulmonary hypertension WHO Group I;
- be on at least one other PAH medication for at least 12 weeks prior to treatment with INOpulse; and
- demonstrate being able to walk between 100 and 450 meters within six minutes.

In addition, this trial excluded patients with evidence of significant left ventricular dysfunction.

The trial is being conducted in two parts, Part A and Part B. In October 2014, we completed Part A of this trial which was a randomized, placebo-controlled, double-blind clinical trial with patients randomized 1:1:1 to placebo or to one of two active doses, either 25 or 75 mcg/kg ideal body weight/hour, or mcg, for 16 weeks. Part B is an ongoing double-blind long-term extension of the initial trial with all patients on one of two doses of INOpulse for PAH to monitor the long-term safety and tolerability of the therapy. Eighty-one percent of the patients in Part A elected to enter the Part B long-term extension trial. The primary endpoint in this trial was a change in pulmonary vascular resistance from baseline at 16 weeks, which was the end of Part A, and the main secondary endpoint was change in six-minute walk distance over the same period. We expect to continue the ongoing Part B of this trial until the earliest of INOpulse for PAH being approved, clinical development of INOpulse for PAH being discontinued or our decision to discontinue Part B.

We randomized 80 patients for Part A of the Phase 2 trial. The majority of the patients were female (79%), white (89%) and had idiopathic PAH (86%). The results from Part A of this trial, which are summarized in the table below, showed trends toward lower pulmonary vascular resistance in both the active arms compared to placebo and a slight trend toward increased six-minute walk distance in the higher dose group. However, neither result was statistically significant. Statistical tests were performed using a one-way analysis of variance, or ANOVA, method.

### INOpulse for PAH—Phase 2 Part A Trial Results for All Patients

<u>Parameter</u>		<u>Placebo</u>	<u>Inhaled nitric oxide dose</u> (mcg/kg ideal body weight/hour)	
			<u>25</u>	<u>75</u>
Total number of patients randomized		26	27	27
Pulmonary Vascular Resistance (dynes sec. cm-5)	Number analyzed	24	23	24
	Baseline (mean)	601.5	665.8	662.9
	Change from Baseline (mean)	47.2	-54.1	-15.0
	p-value (ANOVA)	—	0.091	0.178
6-Minute Walk Distance (m)	Number analyzed	24	24	23
	Baseline (mean)	367.5	326.8	300.7
	Change from Baseline (mean)	7.5	4.7	22.8
	p-value (ANOVA)	—	0.851	0.314

In an analysis of baseline characteristics, patients randomized to placebo were younger and less sick than those on either of the active arms on many dimensions including baseline pulmonary vascular resistance, baseline six-minute walk distance, age, duration of disease and WHO severity class. In addition, fewer of the patients on placebo were on LTOT compared to either of the active arms with more patients on LTOT at the 75 mcg dose than on the 25 mcg dose.

### INOpulse for PAH—Phase 2 Trial Baseline Demographics

	Placebo	Inhaled nitric oxide dose (mcg/kg ideal body weight/hour)	
		25	75
Number of patients	26	27	27
Age (years) (mean)	52.0	56.3	57.9
WHO Severity (number in Classes III and IV)	19	21	23
Disease duration (years) (mean)	5.5	6.2	6.0
Pulmonary Vascular Resistance (dynes sec.cm-5) (mean)	601.5	665.8	662.9
6-Minute Walk Distance (m) (mean)	367.5	326.8	300.7
Use of LTOT	46.2%	59.3%	77.8%

During evaluation of the data, we observed that adherence to therapy was widely variable. LTOT was a pre-specified parameter recorded at baseline, and patients using LTOT at baseline were more adherent to using the device, defined retrospectively as an average use of greater than 12 hours per day—specifically, patients using LTOT had a rate of 70% adherence as compared with 33% adherence in those patients not using LTOT. Based on this observation, we conducted non-scheduled, exploratory analyses by LTOT use and by compliance (defined as patients who had average daily use of 12 hours per day or more). Each of these subgroups comprised more than 50% of the total patients enrolled in the trial. The results of these analyses are summarized in the following table.

## INOpulse for PAH—Phase 2 Part A Trial Compliance to Therapy

<u>Average hours of use</u>	Percent of patients		
	<u>All patients</u>	<u>On LTOT</u>	<u>Not on LTOT</u>
< 4 Hours	6.3%	4.1%	9.7%
4-8 Hours	20.0%	8.2%	38.7%
8-12 Hours	17.5%	16.3%	19.4%
12-16 Hours	22.5%	30.6%	9.7%
16-20 Hours	16.3%	22.4%	6.5%
<sup>3</sup> 20 Hours	17.5%	18.4%	16.1%

Among LTOT users, there was a clinically meaningful and statistically significant improvement versus placebo in both pulmonary vascular resistance and six-minute walk distance in patients at the 75 mcg dose and there was a statistically significant improvement in pulmonary vascular resistance and a positive trend in change in six-minute walk distance in patients on the 25 mcg dose.

In the subgroup of compliant patients who used INOpulse for an average of greater than 12 hours per day, the results were very similar to those of the LTOT subgroup. This was expected since there is a significant overlap between the compliant patient and the LTOT group, with approximately 80% of compliant patients also treated with LTOT at baseline. In the compliant group, when compared to placebo, there was a positive trend for change in pulmonary vascular resistance and a clinically meaningful and statistically significant improvement in six-minute walk distance in the 75 mcg dose arm and there was a statistically significant improvement in pulmonary vascular resistance and a non-significant change in six-minute walk distance in the 25 mcg dose arm.

## INOpulse for PAH—Phase 2 Part A Trial Results for Patient Subgroups

### *Pulmonary Vascular Resistance*

<u>Parameter/Population</u>		<u>Placebo</u>	<u>Inhaled nitric oxide dose (mcg/kg ideal body weight/hour)</u>	
			<u>25</u>	<u>75</u>
Total number of patients randomized		26	27	27
On LTOT	Number analyzed	10	15	19
	Baseline (mean)	580.1	605.2	614.9
	Change from Baseline (mean)	125.5	-47.1	-17.5
	p-value (ANOVA)	—	0.018	0.024
<sup>3</sup> 12 hours per day (Compliant)	Number analyzed	10	12	18
	Baseline (mean)	527.6	747.2	670.6
	Change from Baseline (mean)	146.5	-66.9	-5.1
	p-value (ANOVA)	—	0.023	0.027

### Six-Minute Walking Distance

Parameter/Population		Placebo	Inhaled nitric oxide dose (mcg/kg ideal body weight/hour)	
			25	75
Total number of patients randomized		26	27	27
LTOT	Number analyzed	10	15	18
	Baseline (mean)	333.5	301.5	292.2
	Change from Baseline (mean)	-10.7	9.1	34.9
	p-value (ANOVA)	—	N.S.	0.021
<sup>3</sup> 12 hours per day (Compliant)	Number analyzed	10	12	16
	Baseline (mean)	330.0	316.3	294.5
	Change from Baseline (mean)	-10.1	8.5	37.0
	p-value (ANOVA)	—	N.S.	0.021

INOpulse was relatively well-tolerated in Part A of this trial. Our Independent Data Safety Monitoring Board evaluated the safety analysis from Part A of the trial in November 2014 and recommended proceeding with Part B of the trial. Drug-related serious adverse events, or SAEs, occurred in no patients in the placebo group and one subject in each of the 25 mcg and 75 mcg groups.

### INOpulse—Phase 2 Part A Trial Results for All Patients: Summary Safety Data

Number of Patients	Placebo	Inhaled nitric oxide dose (mcg/kg ideal body weight/hour)	
		25	75
Number of Patients	26	27	27
Total Adverse Events (AEs)	23	22	26
Drug related AEs	9	10	9
Total Serious Adverse Events (SAEs)	4	4	9
Drug related SAEs	0	1	1
Deaths	1	0	0
Discontinuation due to AEs	1	1	2

One patient in the placebo arm died during Part A of the trial. SAEs were reported for four patients in the placebo arm, including one each of: pneumonia/worsening PAH, catheter-related infection, ascites and left hip sciatica. Each of these were assessed by the investigator for the trial as unrelated. Four patients in the 25 mcg low-dose active treatment arm experienced SAEs, including bacteremia, myelodysplastic syndrome, increased shortness of breath and dyspnea, one of which was assessed as possibly related to trial therapy. The 75 mcg high-dose active treatment arm had nine patients with SAEs. The most common SAEs reported were syncope and bronchitis/tracheobronchitis, one of which was assessed as possibly related to trial therapy. Discontinuation of trial therapy due to adverse events, or AEs, occurred for two patients in the 75 mcg arm and one subject in each of the 25 mcg and placebo arms.

We believe the results of this trial provide sufficient indication of clinical benefit and safety to continue development of INOpulse for PAH in pivotal Phase 3 clinical trials. We expect the primary endpoints of these trials will be tied to functional capacity for patients with PAH. We have a meeting scheduled with the FDA in January 2015 to discuss this plan. We expect the Phase 3 program will consist of two adequate and well-controlled confirmatory trials, one with placebo and two active doses of 50 mcg and 75 mcg and the other with placebo and one active dose of 75 mcg. We expect that each arm of each of the trials will have approximately 94 patients and plan to use a primary endpoint of change in six-minute walking distance after 16 weeks of therapy. We plan to use the newer Mark2 device in these trials. Results from our usability testing suggests that compliance with the Mark2 may be better than was the case with the first generation INOpulse DS device. We intend to finalize our plans for this product candidate, including the clinical trial design, following discussion with the FDA and additional discussions with regulatory authorities, including feedback from the EMA. We currently intend to begin Phase 3 trials in the second half of 2015.

### ***INOpulse for PH-COPD***

We are developing INOpulse for PH-COPD to address a significant unmet medical need that we believe is often overlooked in everyday clinical practice because of the lack of available therapy. Pulmonary hypertension is more prevalent among those COPD patients who have advanced loss of respiratory function and low peripheral blood oxygen levels requiring treatment with LTOT. The co-morbidity of pulmonary hypertension in these patients leads to cardiovascular complications from the added strain on the right ventricle of the heart. Current drug therapies for COPD are targeted to relieve the symptoms and complications of the respiratory component of the disease. Unlike these therapies, INOpulse is directed at treating the cardiovascular complications of PH-COPD. We believe PH-COPD patients on LTOT who are at risk for cardiovascular complications could benefit from use of INOpulse in addition to any respiratory benefits that result from their existing treatments.

### ***Disease Background and Market Opportunity***

COPD is a progressive disease caused by chronic inflammation and destruction of the airways and lung tissue. While COPD is primarily a respiratory disease, over time, as the disease progresses, the chronic pulmonary restrictions and resulting deprivation of adequate oxygen, or hypoxia, can contribute to vasoconstriction in the pulmonary arterial bed. In addition, COPD patients can have deficiency in endogenous nitric oxide production in their lungs, which can worsen vasoconstriction. This pulmonary vasoconstriction puts pressure on the right side of the heart, making it less able to cope with stressors and potentially leading to progressive cardiac dilation, heart failure and death. This cardiovascular component of COPD is, we believe, often overlooked despite pulmonologists' general awareness of the problem, in part because there are no specific therapies for the condition in these patients. While it is widely believed that the cardiovascular complications of COPD occur only in the advanced stage of the disease as a consequence of chronic hypoxemia, recent findings demonstrate an earlier involvement of the cardiovascular system in this disease.

In 2010, Datamonitor estimated that over 1.4 million COPD patients in the United States were being treated with LTOT. Based on academic studies, we estimate that 50% of COPD patients on LTOT in the United States have pulmonary hypertension. Even though the degree of pulmonary hypertension in these patients is milder than in PAH patients, data published in literature suggests that even small elevations in mean pulmonary artery pressure in patients with advanced COPD can impact hospitalization, patient-assessed functional outcomes and mortality. Pulmonary hypertension is a well-known predictor of increased morbidity and mortality in COPD patients and is associated with poor quality of life, worse clinical outcomes and shorter survival time. Based on a long-term study completed in 1992 and published in 1995, PH-COPD patients had a four-year survival rate of approximately 50%. By contrast, in this same long-term study, COPD patients with similar pulmonary functions, but without pulmonary hypertension, had a four-year survival rate of 80%.

We expect INOpulse for PH-COPD, if approved, would be treated as a specialty drug. Specialty drugs are typically high-cost medications, often ranging in price in the United States from approximately \$15,000 to \$50,000 per patient per year, used to treat rare or complex conditions, requiring close clinical management and special handling and distributed through specialty pharmacies.

#### *Scientific Rationale for Use of INOpulse for PH-COPD*

The mechanism of action of inhaled nitric oxide in vasodilation at the alveolar smooth muscle in PH-COPD is similar to its action in PAH. Like endogenous pulmonary nitric oxide, inhaled nitric oxide works by selectively relaxing lung vascular smooth muscles, causing dilation of pulmonary blood vessels and consequently increased pulmonary blood flow. This reduces the elevated pulmonary artery pressure in patients with PH-COPD.

PH-COPD patients generally have hypoxemia as a result of deteriorating lung function, which can be treated with supplemental oxygen therapy. However, these patients are not treated with currently approved PAH-specific drugs because these drugs can worsen hypoxemia. This worsening can occur when these drugs, which are systemically bioavailable, cause indiscriminate pulmonary vasodilation, even in poorly ventilated alveoli, resulting in lower average blood oxygenation levels. We believe that inhaled nitric oxide, as a locally active selective pulmonary vasodilator with minimal systemic effects, can drop pulmonary arterial pressures, and when delivered with INOpulse as a targeted pulse to the well-ventilated alveoli, avoid this indiscriminate vasodilation and the consequent lowering of blood oxygen levels.

The targeted delivery of inhaled nitric oxide to specific alveoli is important because early trials with continuous-flow inhaled nitric oxide reduced pulmonary arterial pressure in PH-COPD patients but also resulted in lowering of blood oxygen levels. It was postulated that this unwanted effect might be avoided by administering nitric oxide as a brief pulse at the beginning of each breath because well-ventilated alveoli open faster, and a brief early pulse would only reach these alveoli. As early as 1997, this concept was demonstrated by testing inhaled nitric oxide in PH-COPD patients during exercise, which allowed the dose to mimic pulse dosing. Recently, data from a computational fluid-flow modeling study we conducted, using high resolution computed tomography scans and computer simulations, supported this hypothesis that early pulsed delivery of nitric oxide could be directed specifically to the well-ventilated alveoli.

#### *Clinical Development Program*

INOpulse for PH-COPD is designated as a drug-device combination by the FDA and is being evaluated through the Division of Cardiovascular and Renal Products of the Center for Drug Evaluation and Research with consultation from the Division of Pulmonary, Allergy, and Rheumatology Products and the Center for Devices and Radiological Health. In our IND for PH-COPD, we referenced all of the information in our IND for PAH and included data from a Phase 2 clinical trial that Ikaria commenced in 2005 but terminated after one subject was treated due to lack of enrollment. The one subject experienced a serious adverse event of hypoxia, which was deemed unrelated to treatment. The data referenced in our IND, as well as the years of use of the marketed product, demonstrate that nitric oxide is well tolerated. The FDA has agreed that the IND package is complete and adequate for supporting Phase 2 clinical development of INOpulse for PH-COPD. The FDA also agreed that no additional pre-clinical studies are needed to support product approval.

In the European Union, where there is no formal drug-device designation, we expect that INOpulse for PH-COPD will be evaluated by the EMA as a drug with specific reference in the label to the device and cannula, which will require a separate CE mark from a Notified Body.

In an initial three-month, open-label chronic-use Phase 2 trial, pulsed inhaled nitric oxide significantly reduced pulmonary arterial pressures in PH-COPD patients on LTOT and did so without causing hypoxemia, which is a significant concern for these patients. The inhaled nitric oxide was

administered using a device that delivered pulsed nitric oxide as a fixed amount per breath along with the oxygen using a single lumen nasal cannula. This trial, completed in 2000, was conducted in two parts, an initial acute dose titration part and a three-month chronic ambulatory use part. In the initial acute test each patient was treated with doses of 10, 15, 20, 25 and 30 ppm nitric oxide in a step-wise escalation from the lowest to higher doses. Each patient was assessed for drops in mean pulmonary arterial pressures, or mPAP, as well as for changes in oxygenation levels. The mean acute change in mPAP in this study was a reduction of approximately 4 mmHg from a baseline of 27 mmHg across all doses. In another measure of the hemodynamic effects of the drug, the pulmonary arterial systolic pressure reduced by 2.7 to 3.6 mmHg across the nitric oxide doses tested. Based on the individual mPAP and oxygenation level changes in the acute test, each patient was assigned an individualized dose to be used in the second part of the trial which was a three-month evaluation. The patients were then randomized to either the control group for treatment with oxygen therapy or to the active group for treatment with both oxygen and the individually selected dose of nitric oxide over a period of three months. A total of 32 patients completed the three month portion per protocol, 15 of whom had been randomized to drug therapy and 17 of whom were randomized to the control group. At the end of the three month chronic use portion of the trial, patients in the nitric oxide arm had a statistically significant decrease from baseline in mPAP of 6.8 mmHg compared to an increase in mPAP of 0.9 mmHg in the oxygen alone control arm of the trial ( $p < 0.001$ ) demonstrating a sustained and potentially strengthened effect of inhaled nitric oxide on mPAP over three months. In addition, at the three month evaluation, the patients treated with pulsed inhaled nitric oxide had no worsening of blood oxygen levels compared to the control group suggesting no worsening of oxygen exchange in the lungs.

In June 2012, this data was submitted to the FDA as part of the IND package for INOpulse for PH-COPD. Based on discussions with the FDA, we believe this trial is an adequate Phase 2 trial. The FDA has asked us to confirm the dose range and the safety related to hypoxemia in PH-COPD patients using the INOpulse device, prior to proceeding to large scale trials. Following this guidance, we conducted a Phase 2 acute dose ranging trial with the INOpulse DS device. This Phase 2 trial, which we completed in July 2014, identified a dose range that showed similar efficacy versus baseline when compared to the initial acute effects of pulsed nitric oxide in the original chronic-use study. The 10 mcg dose of INOpulse showed a decrease in pulmonary arterial systolic pressure from baseline of 5.4 mmHg ( $p < 0.05$ ) and increasing the dose above 10 mcg did not result in a further decrease in pulmonary arterial systolic pressure from baseline indicating a plateau effect of the drug at 10 mcg and above. A post-hoc analysis of data combining all response data over the range of 10 to 75 mcg showed a decrease in pulmonary arterial systolic pressure from baseline of 4.2 mmHg, which was significant and represented a mean decrease of approximately 9% from baseline. In addition, in our confirmatory trial, none of the INOpulse doses tested had an adverse effect on hypoxemia relative to placebo with a total of 48 patients with confirmed oxygenation level decrease greater than 5 mmHg from baseline (16/40 in placebo; 32/84 in inhaled nitric oxide). While the reduction in pulmonary arterial pressure did not reach statistical significance versus placebo in this acute setting, as the decrease in pulmonary arterial systolic pressure from baseline in the placebo group was 1.9 mmHg, we believe that the results have confirmed a dose range for this therapy that delivers a significant reduction in pulmonary arterial pressure versus baseline without causing hypoxemia in patients with PH-COPD.

We are currently designing a Phase 2b trial to evaluate safety and efficacy for chronic use of INOpulse for PH-COPD. We plan to finalize the protocol following discussions with regulatory authorities in the United States and European Union.

#### ***INOpulse for Other Pulmonary Hypertension Conditions***

Pulmonary hypertension disease is often classified according to the WHO classification system which groups patients with pulmonary hypertension according to the underlying etiologies, or causes, of the pulmonary hypertension. In this system, PAH is defined as Group 1 and PH-COPD is classified under Group 3, pulmonary hypertension due to lung disease and/or hypoxemia. We believe the



mechanism of action of inhaled nitric oxide as a pulmonary vasodilator, and thus INOpulse, can be effective in treating pulmonary hypertension related to other conditions, including pulmonary hypertension associated with PH-IPF and other interstitial lung diseases, chronic thromboembolic pulmonary hypertension, or CTEPH, and pulmonary hypertension associated with sarcoidosis.

While there are two recently approved treatments for IPF, there are currently no approved therapies for PH-IPF. In 2013, riociguat (Adempas) was the first drug therapy approved for treating CTEPH, although other PAH medications are sometimes used to treat this condition. Patients with sarcoidosis are often treated with steroids or other anti-inflammatory medications, however, there are no therapies approved to treat the PH associated with this disease.

Our current license from Ikaria covers only the development of INOpulse for PAH, PH-COPD and PH-IPF. We would need to obtain additional license rights from Ikaria before beginning development of INOpulse for any other indication.

### ***BCM for Prevention of Cardiac Remodeling Following a STEMI***

We are developing BCM through the medical device regulatory pathway to prevent congestive heart failure following a STEMI, which is a type of severe heart attack. Patients who suffer a STEMI are at increased risk for congestive heart failure due to potential cardiac remodeling, which is a structural change in the size and shape of the heart that affects its ability to function normally. This change includes thinning of the left ventricle wall at the infarction and the adjacent border zone, outward bulging of the infarcted region, hypertrophy of the non-infarcted portion of the left ventricle and dilation of the left ventricle chamber. Cardiac remodeling increases mechanical stresses on the left ventricular wall and reduces the efficiency of pumping blood often leading to congestive heart failure.

BCM is intended to prevent cardiac remodeling by reducing the abnormal increase in ventricular wall stress and structural changes in the heart after a STEMI. Once blood flow has been re-established to the affected heart muscle of a patient following a STEMI, a physician deploys BCM through the coronary artery related to the infarcted region of the left ventricle. BCM is designed to flow into the damaged heart muscle where it forms a flexible scaffold to enhance the mechanical strength of the heart muscle during recovery and repair, thereby preventing cardiac remodeling. We have an exclusive worldwide license to BCM under a license agreement we entered into with BioLine in August 2009.

### ***Disease Background and Market Opportunity***

An AMI is generally a sudden event resulting from a blockage of one or more of the arteries supplying blood to the heart. This can cause the heart muscle to die or temporarily stop working. In some patients, particularly those with large areas of the heart affected by the AMI, the dead or stunned muscle in the infarcted area can start to degrade even if blood flow is subsequently restored.

Given recent advances in treating AMIs, patients do not typically die of the acute event, especially in developed countries with good hospital systems. Instead, post-AMI patients are at an increased risk of congestive heart failure that results from the loss of structural support where the tissue has died, leading to a change in the shape of the heart, or remodeling, excess blood being left in the heart after it beats and increased strain on the left ventricular wall. This left ventricular dysfunction is characterized by increased ventricular volume and decreased ejection fraction, which is the fraction of blood in the heart that is pumped out each time it contracts. The early impact of the heart attack on ejection fraction and left ventricular end-systolic volume is predictive of left ventricular function one year after the initial event. This deterioration in left ventricular function, which indicates adverse ventricular remodeling, can eventually cause the heart not to pump enough blood to the body, leading to congestive heart failure. In a large controlled study, worsening of ventricular measures was predictive of both mortality and heart failure.

Data from long-term third-party studies suggests that the five-year post-AMI rate of congestive heart failure or death is approximately 35% to 40%. In addition, based on data presented from the study conducted in Olmstead County, Minnesota, we estimate that the three-year post-AMI rate of congestive

heart failure or mortality among patients who have had an AMI is approximately 30%. We are developing BCM to fill this unmet medical need by providing structural support of the heart muscle in the early days and months following an AMI, which is a critical period when the extracellular matrix is first degraded and then reconstituted as part of the heart's response to the injury and the time at which the heart is at high risk for remodeling. We expect that deploying BCM will help prevent cardiac remodeling and possibly the progression to advanced stages of congestive heart failure.

According to hospital claims data and American Heart Association estimates, in 2014, the estimated incidence of AMI hospital admissions in the United States will be over 900,000. There are two classifications of AMI, STEMI and non-STEMI. While both types of AMIs can cause significant damage to the heart, STEMIs tend to have more severe acute symptoms. We estimate that nearly one-third of AMI hospital admissions in the United States were for STEMI. Additionally, according to a report published in the European Heart Journal in 2010, over one million people suffer from AMI in Europe, over half of whom have a STEMI. The costs of treating the consequences of AMI can be substantial. The American Heart Association reported that the total cost of congestive heart failure in 2012 was approximately \$30.0 billion in the United States, and we estimate that approximately 40% of these patients were treated for congestive heart failure following an AMI. The average hospitalization costs in the United States for congestive heart failure have been estimated to be in the range \$17,000 to \$21,000 per admission with total lifetime medical costs following CHF diagnosis estimated at more than \$100,000 per patient. Therefore, we believe BCM could be a treatment that would help to prevent cardiac remodeling and thereby reduce the incidence of congestive heart failure, which could generate significant medical cost savings in addition to improving the quality of life of these patients.

#### *Scientific Rationale for Use of BCM in the Prevention of Cardiac Remodeling Following a STEMI*

BCM is a clear, low-viscosity solution containing sodium alginate and calcium gluconate. Alginates, which are complex sugars obtained from seaweed, have been used extensively in the food industry as well as by the pharmaceutical and medical device industries. In medical devices, alginates have been used as wound dressings, as bone-void fillers and to create dental impressions. BCM's specific, patent-protected composition has been optimized to be partially cross-linked by calcium ions and to maintain a free-flowing liquid state for injection into the blood stream. However, when injected into the heart following an AMI, we believe that BCM will flow into the damaged heart muscle where it will come into contact with the additional extracellular calcium that is released by the newly dead heart muscle cells, resulting in the formation of additional cross-links within the alginate. These cross-links turn BCM into a gel meshwork with mechanical properties similar to the normal extracellular cardiac matrix. Based on data from animal studies, we believe these properties allow BCM to provide temporary structural support to the wall of the heart while it heals after an AMI.

Once deposited, BCM remains in the infarct zone for a few months. As the heart heals and the extracellular calcium levels return to normal, the crosslinks in the gel slowly degrade, and the alginate returns to liquid form and is excreted via the kidneys. In our pre-clinical animal studies of BCM, tissue sample analysis has shown that most of the alginate dissipates within three months and is no longer detectable in the heart or elsewhere in the body within six months after BCM injection. In an academic study published in the Journal of the American College of Cardiology, pigs were injected with either BCM or saline following an AMI. In this study, the pigs that received saline had approximately 44% greater enlargement in left ventricular chamber volume after 60 days compared to the pigs that received two milliliters of BCM. In another academic study conducted in dogs with AMI, deploying BCM at any time within one week of an AMI reduced cardiac remodeling compared to placebo.

#### *Clinical Development Program*

BCM is a Class III medical device that we are developing to prevent cardiac remodeling and subsequent congestive heart failure after AMI following successful re-opening of the blood vessels. We are currently conducting a clinical trial of BCM, which is designed as a CE mark registration trial in

the European Union. We refer to this trial as our PRESERVATION I trial, and it is designed as a double-blind, placebo-controlled trial, and the primary endpoint is change in anatomical measurements six months after device deployment.

The principal treatment for a STEMI is to re-establish blood flow in the blocked coronary artery at the earliest possible opportunity. This can be achieved by percutaneous coronary intervention, dissolving the blockage with medications or open heart surgery. BCM is designed to be deployed via a percutaneous coronary intervention into the previously blocked coronary artery after blood flow has been re-established.

We are developing BCM in the United States under an IDE and in consultation with a Notified Body in the European Union, which regulates the testing and use of devices. For our IDE application, we performed animal and *in vitro* studies and device effectiveness studies in pigs. Our pre-clinical studies demonstrated that BCM was well tolerated and showed activity in reducing cardiac remodeling after AMI in pigs when deployed in either a dedicated percutaneous coronary intervention procedure or during an initial percutaneous coronary intervention procedure. The FDA has agreed that the non-clinical package is complete and adequate for supporting clinical development, as specified in the IDE, and for registration of BCM.

The first human trial for BCM was a pilot clinical trial conducted by BioLine in Europe and completed in 2009, in which BCM was safely administered to 27 patients within seven days following a moderate to large STEMI and percutaneous coronary intervention. This open-label trial, in which all patients were treated with a two milliliter device, was conducted in multiple centers in Germany and Belgium and included patients who had experienced a first AMI of substantial size. The primary purpose of this trial was to evaluate the safety of BCM deployment. In addition, some efficacy parameters could be observed as all patients suffered a STEMI and had serial echocardiography studies performed at one, three and six months. A total of 27 patients (mean age 54±9 years) after a STEMI were treated during the course of this trial. Twenty-four patients were male, and 19 had experienced an anterior AMI with peak creatine kinase levels of 3183±1490 international units per liter. The time from symptom onset to primary percutaneous coronary intervention ranged from 0.6 to 84.7 hours (with a mean of 9.9±16.9 hours and a median of 3.8 hours). There were no serious adverse events observed with BCM at deployment. In this trial, eight patients experienced at least one treatment-emergent serious adverse event, and one event, a single episode of syncope that occurred 172 days after BCM deployment, was judged as possibly device related. In addition, 21 patients reported at least one adverse event in the initial six-month follow-up period. This data showed that BCM was well tolerated when deployed in patients following an AMI. In addition, standard echocardiogram measures of heart function were performed. In the six-month evaluation, patients in the study, each of whom had large STEMIs, had measures of left ventricular function, including left ventricular end diastolic index, or LVEDVI, of left ventricular end systolic volume index, or LVESVI, and of left ventricular ejection fraction that indicated no change from baseline. Although interpretation of this data is limited by the lack of a control group, data from patients who were treated showed little change in these left ventricular measures, the worsening of which have been linked to mortality and heart failure.

In addition to the short-term testing during the first six months following the STEMI, the 27 patients had annual follow-up safety evaluations planned for up to five years. At the four-year follow-up evaluation, which is the most recent data set available, 25 of the 27 patients were confirmed to still be alive. Of the two patients not confirmed alive, one died from T-cell lymphoma, which was likely a pre-existing condition, and one was lost to follow-up between the three- and four-year follow-up evaluations. However, the patient lost to follow-up had no device-related adverse events at the three-year follow-up evaluation. Of the 25 patients who were confirmed to be alive at year four, one had a hospitalization for congestive heart failure, which occurred within one year of device deployment. In addition, based on available data, during the four-year evaluation period, five patients experienced at least one cardiac ischemic event (nine cardiac ischemic events in total), none of which were considered to be related to BCM. This data from the four-year safety follow-up evaluations is better than we

expected based on our review of publicly reported data from two long-term third-party studies of AMI patients, the Framingham Heart Study and the Olmstead County. The data from these two studies suggest that the rate of congestive heart failure or death five years following an AMI is approximately 35% to 40%. In addition, based on data presented from the Olmstead County study, we estimate that the three-year post-AMI rate of congestive heart failure or mortality among patients who have had an AMI is approximately 30%.

We are currently conducting a feasibility clinical trial of BCM, which we refer to as our PRESERVATION I trial. This trial is a CE mark registration trial for EU regulatory purposes and is comparable to a Phase 2 clinical trial in the United States. Enrollment in this trial, which is being conducted at almost 90 clinical sites in Europe, Australia, North America and Israel, is almost complete with over 290 out of 306 patients enrolled, as of November 15, 2014. Our key inclusion criteria for this trial include that patients must have:

- suffered from a large STEMI as measured by cardiac enzymes;
- clinical signs of significant cardiac damage;
- imaging evidence of impaired heart function; and
- had a primary percutaneous coronary intervention with a stent placed.

In this double-blind trial, patients are randomized in a two-to-one ratio to BCM or placebo. The trial device is injected in a second percutaneous coronary intervention two to five days after the initial myocardial infarction. The primary endpoint is change in the anatomical measurement of left ventricular end-diastolic volume index by echocardiography measured six months after device deployment. Secondary endpoints include the measurement of functional capacity of change in six-minute walk distance and the measurement of patient reported outcome as recorded on the quality of life tool of Kansas City Cardiomyopathy Questionnaire. In addition, as required by the trial protocol, we will follow all patients to monitor safety for a period of five years after device deployment. The Data Safety Monitoring Board for this trial has met six times to evaluate the safety data and on each occasion has approved the continuation of the trial as planned. We expect to complete enrollment in this trial by the end of 2014 and report top line results in mid-2015. We also expect that if our PRESERVATION I trial is successful, we will rely on the results to seek CE marking for BCM in the European Union.

Assuming positive results from our PRESERVATION I trial, we plan to conduct a second, larger clinical trial to support approval in the United States through the PMA pathway. We met with the FDA to discuss U.S. regulatory requirements for a pivotal clinical trial. Based on discussions with the FDA Center for Devices and Radiological Health in May 2010, we expect that our pivotal trial will include approximately 1,000 patients, having a composite endpoint of anatomic measurements of left ventricular end-diastolic volume index, a patient outcomes measurement test and a functional measure such as six-minute walk distance or a cardiopulmonary stress test.

If the PRESERVATION I trial demonstrates that BCM is well tolerated and has a clinical benefit in severe STEMIs when deployed in a second percutaneous coronary intervention procedure, we intend to consider testing BCM in an expanded population, including patients with moderate STEMIs, and for deployment of BCM during the primary percutaneous coronary intervention procedure, eliminating the need for a second invasive procedure.

## **Relationship with Ikaria after the Spin-Out**

The development of our programs was initiated under the leadership of our scientific and development team while at Ikaria. Ikaria's lead product, INOmax, is an inhaled nitric oxide product used for treatment of persistent pulmonary hypertension of the newborn. Our understanding of the medical applications of nitric oxide and associated delivery devices, as well as our innovative approach to the pulsed delivery of nitric oxide, originated at Ikaria, and we in-licensed BCM while we were a part of Ikaria.

In October 2013, Ikaria completed an internal reorganization of certain assets and subsidiaries, in which it transferred to us exclusive worldwide rights, with no royalty obligations, to develop and commercialize pulsed nitric oxide in PAH, PH-COPD and PH-IPF. Following the internal reorganization, in February 2014, Ikaria distributed all of our then outstanding units to its stockholders through the payment of a special dividend on a pro rata basis based on each stockholder's ownership of Ikaria capital stock. We refer to Ikaria's distribution of our then outstanding units to its stockholders as the Spin-Out. Shortly after the Spin-Out, Ikaria was acquired by entities affiliated with Madison Dearborn Partners. Ikaria retains the right to develop and commercialize inhaled nitric oxide products, including pulsed products, in all indications other than PAH, PH-COPD and PH-IPF.

In connection with the Spin-Out, we entered into several agreements with Ikaria providing for, among other things, the provision of transition services, the cross license of certain intellectual property, commitments not to compete, the manufacture and supply of the INOpulse drug and device and certain employee matters.

### ***Transition Services Agreement***

In February 2014, we entered into a transition services agreement with Ikaria, which we refer to as the TSA. Pursuant to the terms and conditions of the TSA, Ikaria has agreed to use commercially reasonable efforts to provide certain services to us, including human resources support, real estate support, information technology support, accounting and tax support, treasury support, financial planning and analysis support, purchasing support, management/executive services, legal services, quality services, regulatory services, drug and device safety services, business development support, biometrics support and manufacturing support. Ikaria is obligated, subject to the terms of the TSA (including the early termination provisions thereof and our obligation to use commercially reasonable efforts to provide the services for ourselves as soon as practicable), to provide such services until February 2016.

Ikaria has also agreed, on the terms and subject to the conditions of the TSA, to use commercially reasonable efforts to allow our employees to remain in Ikaria's Hampton, New Jersey facility for the continued operation of our business during the term of the TSA.

We are obligated to pay Ikaria a service fee in the amount of \$772,000 per month and to reimburse Ikaria for any out-of-pocket expenses incurred in connection with its provisions of services under the TSA, any taxes imposed on Ikaria in connection with the performance or delivery of services under the TSA and any costs and expenses incurred by Ikaria in connection with the performance of any services that require resources outside of the existing resources of Ikaria or that otherwise interfere with the ordinary operations of Ikaria's business. This monthly service fee is payable by us regardless of the frequency or quantity of services actually utilized by us under the TSA, and our obligation to pay such monthly service fee until February 2016 will survive any early termination of the TSA. At the time we entered into the TSA, we also entered into an escrow agreement, pursuant to which we deposited \$18.5 million, representing the aggregate amount of the monthly service fees payable by us under the TSA, into escrow to guarantee our payment of such fees to Ikaria. We are also obligated to pay any fees, costs, expenses or other amounts incurred by Ikaria to obtain the right to allow our employees to remain in the Hampton, New Jersey facility during the term of the TSA.

### ***Exclusive Cross-License, Technology Transfer and Regulatory Matters Agreement***

In February 2014, we entered into an exclusive cross-license, technology transfer and regulatory matters agreement with Ikaria. Pursuant to the terms of the license agreement, Ikaria granted to us a fully paid-up, non-royalty bearing, exclusive license under specified intellectual property rights controlled by Ikaria to engage in the development, manufacture and commercialization of nitric oxide, devices to deliver nitric oxide and related services for or in connection with out-patient, chronic treatment of patients with PAH, PH-COPD or PH-IPF, which we refer to collectively as the Bellerophon indications.

We have granted to Ikaria a fully paid-up, non-royalty-bearing, exclusive license under specified intellectual property rights that we control to engage in the development, manufacture and commercialization of products and services for or used in connection with the diagnosis, prevention or treatment, whether in- or out-patient, of certain conditions and diseases other than the Bellerophon indications and for the use of nitric oxide to treat or prevent conditions that are primarily managed in the hospital, which we refer to collectively as the Ikaria nitric oxide business.

We have agreed that, during the term of the license agreement, we will not, without the prior written consent of Ikaria, grant a sublicense under any of the intellectual property licensed to us under the license agreement to any of our affiliates or any third party, in either case that directly or indirectly competes with the Ikaria nitric oxide business. We have also agreed that we will include certain restrictions in our agreements with customers of our products to ensure that such products will only be used for the Bellerophon indications.

The license agreement will expire on a product-by-product basis for products for a specific Bellerophon indication at such time as we are no longer developing or commercializing any product for such indication. The license agreement may be terminated by either party in the event an act or order of a court or governmental authority prohibits either party from substantially performing under the license agreement. Either party may also terminate the license agreement in the event of an uncured material breach by the other party or in the event the other party is insolvent or in bankruptcy proceedings. Ikaria may also terminate the license agreement if we or any of our affiliates breach the agreements not to compete described below, or if we or any successor to our rights under the license agreement markets a generic nitric oxide product that is competitive with INOmax. Under certain circumstances, if the license agreement is terminated, the licenses granted to Ikaria by us will survive such termination.

### ***Agreements Not to Compete***

In September 2013, October 2013 and February 2014, we and each of our subsidiaries entered into an agreement not to compete with Ikaria. We refer to these agreements collectively as the agreements not to compete. Pursuant to the agreements not to compete, we and each of our subsidiaries agreed not to engage, anywhere in the world, in any manner, directly or indirectly, until the earlier of five years after the effective date of such agreement not to compete or the date on which Ikaria and all of its subsidiaries are no longer engaged in such business, in:

- the development, manufacture, commercialization, promotion, sale, import, export, servicing, repair, training, storage, distribution, transportation, licensing or other handling or disposition of any product or service (including, without limitation, any product or service that utilizes, contains or includes nitric oxide for inhalation, a device intended to deliver nitric oxide or a service that delivers or supports the delivery of nitric oxide), bundled or unbundled, for or used in connection with (a) the diagnosis, prevention or treatment, in both adult and/or pediatric populations, and whether in- or out-patient, of: (i) hypoxic respiratory failure associated with pulmonary hypertension, (ii) pulmonary hypertensive episodes and right heart failure associated with cardiovascular surgery, (iii) bronchopulmonary dysplasia, (iv) the management of

ventilation-perfusion mismatch in acute lung injury, (v) the management of ventilation-perfusion mismatch in acute respiratory distress syndrome, (vi) the management of pulmonary hypertension episodes and right heart failure in congestive heart failure, (vii) pulmonary edema from high altitude sickness, (viii) the management of pulmonary hypertension episodes and right heart failure in pulmonary or cardiac surgery, (ix) the management of pulmonary hypertension episodes and right heart failure in organ transplant, (x) sickle cell vaso-occlusive crisis, (xi) hypoxia associated with pneumonia or (xii) ischemia-reperfusion injury or (b) the use of nitric oxide to treat or prevent conditions that are primarily managed in the hospital; or

- any and all development, manufacture, commercialization, promotion, sale, import, export, storage, distribution, transportation, licensing, or other handling or disposition of any terlipressin or any other product within the pressin family, (a) intended to treat (i) hepatorenal syndrome in any form, (ii) bleeding esophageal varices or (iii) septic shock or (b) for or in connection with the management of low blood pressure.

The agreements not to compete expressly exclude the Bellerophon indications.

In February 2014, we also entered into drug and device clinical supply agreements and an employee matters agreement with Ikaria See "Manufacturing" below for a description of the drug and device clinical supply agreements and "Certain Relationships and Related Person Transactions—Relationship with Ikaria" for a description of the employee matters agreement.

### **BioLine License Agreement**

In August 2009, we entered into a license agreement with BioLineRx, Ltd. and BioLine Innovations Jerusalem L.P., under which we obtained an exclusive worldwide license to BCM. Under the license agreement, we are obligated to use commercially reasonable efforts to develop and commercialize at least one product containing BCM. We have established a joint development committee with BioLine to oversee the development of BCM.

We paid BioLine a \$7.0 million upfront payment in 2009 and a \$10.0 million milestone payment in 2010. Under the terms of the license agreement, if we achieve certain clinical and regulatory events specified in the license agreement, we will be obligated to pay milestone payments to BioLine that could total, in the aggregate, up to \$115.5 million, and if we achieve certain commercialization targets specified in the license agreement, we will be obligated to pay additional milestone payments to BioLine that could total, in the aggregate, up to \$150.0 million. In addition, we will be obligated to pay BioLine a specified percentage of any upfront consideration we receive for sublicensing BCM, as well as royalties at a percentage in the low double digits below 20% on net sales, if any, of any approved product containing BCM, subject to offsets for specified payments to third parties made in connection with BCM. Our obligation to pay BioLine royalties will expire on a product-by-product and country-by-country basis on the date on which BCM is no longer covered by a valid claim in the licensed patent rights in the given country.

BioLine has the option, exercisable under specified circumstances, to manufacture any product containing BCM for us pursuant to terms to be negotiated by the parties. If BioLine exercises this option, we would generally be obligated to purchase at least a specified percentage of our BCM requirements from BioLine at a price calculated using a pre-agreed methodology, and the parties would be required to establish a joint manufacturing committee to coordinate manufacturing efforts.

Except under specified circumstances, neither we, nor any other person that controls, is controlled by, or is under common control with us, may directly or indirectly acquire more than a specified percentage of the equity or debt securities of BioLine, or urge, induce, entice or solicit any other party to acquire such securities, without BioLine's consent.

We and BioLine have the right to terminate the license agreement for an uncured material breach by the other party. In addition, we have the right to terminate the license agreement if at any time we determine that further development of products containing BCM is not warranted.

BioLine has indicated to us that it believes that we have breached the license agreement in several ways, including, but not limited to, failure to use commercially reasonable efforts to develop BCM, failure to provide BioLine with material information concerning the development and commercialization plans for BCM and failure to notify BioLine in advance of material public disclosures regarding BCM. We and BioLine also disagree about the timing of a \$12.5 million milestone payment that we would owe BioLine based upon progress in our BCM clinical development program. We believe we have complied with our obligations under the license agreement to use commercially reasonable efforts to develop BCM and are not currently in breach of our other obligations under the license agreement. Although we have had multiple discussions with BioLine on these issues, and these discussions are continuing, we have not been able to resolve these outstanding issues. If we are unable to reach agreement with BioLine on these issues, BioLine could bring a lawsuit against us, although any claims relating to our alleged failure to use commercially reasonable efforts would first be subject to a non-binding 60-day mediation period with a third-party mediator. We believe that we would have strong defenses in any litigation that could be brought by BioLine. If BioLine were to prevail in any such litigation, one of the potential remedies would be the return of BCM to BioLine.

## **Manufacturing**

### ***INOpulse Drug Product***

In February 2014, we entered into a drug clinical supply agreement with Ikaria, or the drug supply agreement, pursuant to which Ikaria has agreed to use commercially reasonable efforts to manufacture and supply, and we have agreed to acquire from Ikaria, our requirements for nitric oxide for inhalation and corresponding placebo for use in our clinical programs for PAH, PH-COPD and PH-IPF. Pursuant to the drug supply agreement, we will pay to Ikaria an amount equal to Ikaria's internal and external manufacturing cost plus 20%. Under the terms of the drug supply agreement, we have also granted Ikaria a right of first negotiation in the event that we desire to obtain supply of nitric oxide for inhalation and corresponding placebo (or any variant thereof or any version with different specifications) for commercial use. The drug supply agreement will expire on a product-by-product basis on the date we discontinue clinical development of such product. In addition, either party may terminate the drug supply agreement in the event of an uncured material breach by the other party.

Ikaria manufactures pharmaceutical-grade nitric oxide at its facility in Port Allen, Louisiana. This facility, which we believe is operated in compliance with current Good Manufacturing Practices, or cGMP, is the only FDA-inspected site for manufacturing pharmaceutical-grade nitric oxide in the world. The primary manufacturing activity at the site is the commercial production of INOmax and production of INOpulse. This production includes the chemical synthesis of high-purity nitric oxide, which is the active pharmaceutical ingredient in INOmax and INOpulse, and the filling of the gas cylinders in which the products are packaged.

To support business outside of the United States, the Port Allen manufacturing facility has also successfully passed inspections by local agencies, the EMA, Health Canada; the Pharmaceutical and Medical Devices Agency, or PMDA, of Japan, and the Korean FDA, or KFDA. The EMA, the Health Protection Branch of Health Canada, PMDA and KFDA operate in a similar fashion to the FDA in that each requires submission of a dossier containing substantial evidence of safety and effectiveness prior to approval. These agencies' monitoring of safety in a post-marketing setting also is similar to that of the FDA.

The operations that Ikaria currently performs for us consist of two steps. The first step is to manufacture the concentrated drug product, which Ikaria conducts using the same processes that it uses



to manufacture its own drug product. The second step is the filling operation in which the pre-mix product is mixed to the appropriate concentration and filled into the final cartridges that we use with INOpulse. As we have reduced the size and weight of INOpulse, we have also developed a smaller, more-concentrated drug cartridge for INOpulse. The filling process has been developed by Ikaria as a high-throughput batch fill process that leverages several technologies that Ikaria has developed, and we have licensed, to fill smaller containers at a higher pressure and purity and at a significantly higher production rate than prior technology.

This manufacturing system is designed to be modular and can be expanded as needed. The current installed capacity within the Port Allen plant is sufficient to support our INOpulse clinical program as currently planned. In addition, the plant has the capacity to expand to meet additional demand. We have a license from Ikaria to use this fill process technology to work with additional companies, as needed, to produce the final cartridge. Commercial supply manufacturing can be supported with additional units installed at the Port Allen site or other regional locations, by Ikaria or other manufacturers, as determined by distribution requirements. For our clinical trials, Ikaria can supply and ship product from the Port Allen site and the current cartridges are expected to have a shelf life of at least one year. We are testing the finished product to potentially establish a shelf life of up to two years.

### ***INOpulse Drug Delivery Systems***

Ikaria has a drug delivery system manufacturing facility in Madison, Wisconsin, at which it designs, engineers, assembles, packages and distributes drug delivery systems, including INOpulse. In February 2014, we entered into a device clinical supply agreement with Ikaria, or the device supply agreement, pursuant to which Ikaria will use commercially reasonable efforts to manufacture and supply our requirements for certain nitric oxide delivery devices specified in the device supply agreement for use in our INOpulse clinical program. Pursuant to the device supply agreement, we will pay to Ikaria an amount equal to Ikaria's internal and external manufacturing cost plus 20%. The device supply agreement will expire on February 9, 2015. In addition, either party may terminate the device supply agreement in the event of an uncured material breach by the other party. Prior to the expiration of the device supply agreement, we intend to negotiate and enter into a new agreement with either Ikaria or another third-party manufacturer to assemble the Mark2 devices we expect to use in any future clinical trials of INOpulse for PAH and INOpulse for PH-COPD.

Each version of our INOpulse device currently under development will be pre-programmed at the time of manufacture to the dose setting specified for the applicable indication. Since PAH patients have the potential for rebound pulmonary hypertension, which is a sudden and serious increase in pulmonary arterial pressure that results from therapy withdrawal, patients with this condition are required to have a backup system. Accordingly, we will be required to provide PAH patients with either a separate backup device or a device with a built-in pneumatic, or non-electrical, backup system. Also, pursuant to the terms of our license agreement with Ikaria, we are required to lease and not to sell our INOpulse devices as well as to track and maintain control of the indications for which each are used. We intend to meet these requirements by maintaining close monitoring of the use of the devices, including through planned remote data downloads and a system diagnostic feature.

### ***BCM Product***

We currently outsource the manufacture of BCM for use in clinical trials. BCM is manufactured by a third-party under the terms of a manufacturing and supply agreement which expires in April 2017. We plan to enter into a manufacturing and supply agreement for BCM with a third-party prior to April 2017.

BCM is composed of ultra-pure sodium alginate and calcium-D-gluconate. We purchase sodium alginate from FMC BioPolymer AS (doing business as NovaMatrix™) under the terms of a clinical

supply agreement that expires in December 2018. We and FMC BioPolymer have agreed to negotiate a commercial supply agreement prior to the December 2018 expiration of the clinical supply agreement. Calcium-D-gluconate is a commodity item available from multiple suppliers. If BCM is approved for commercial sale, we will likely continue to outsource its manufacture to contract manufacturers.

BioLine has the option, exercisable under specified circumstances, to manufacture any product containing BCM for us pursuant to terms to be negotiated by the parties. If BioLine exercises this option, we would generally be obligated to purchase at least a specified percentage of our BCM requirements from BioLine at a price calculated using a pre-agreed methodology, and the parties would be required to establish a joint manufacturing committee to coordinate manufacturing efforts.

## Competition

The biotechnology and pharmaceutical industries are highly competitive. There are many pharmaceutical companies, biotechnology companies, public and private universities and research organizations actively engaged in the research and development of products that may be similar to our products. In addition, other companies are increasingly looking at cardiac and cardiopulmonary indications as a potential opportunity. It is possible that the number of companies seeking to develop products and therapies for the treatment of unmet needs in our target markets will increase.

Our competitors, either alone or with their strategic partners, may have substantially greater financial, technical and human resources than we do and significantly greater experience in the discovery and development of product candidates, obtaining FDA and other regulatory approvals of products and the commercialization of those products. Accordingly, our competitors may be more successful than we may be in obtaining approval for therapies and achieving widespread market acceptance. We anticipate that we will face intense and increasing competition as new drugs and advanced technologies become available.

Currently, there are 12 drugs approved for the treatment of PAH, within the following categories: prostacyclin and prostacyclin analogs (including Flolan (epoprostenol), which is marketed by GlaxoSmithKline, Tyvaso (treprostinil), Orenitram (treprostinil) and Remodulin (treprostinil), which are marketed by United Therapeutics Corporation, and Ventavis (iloprost) and Veletri (epoprostenol), which are marketed by Actelion Pharmaceuticals US, Inc., or Actelion), phosphodiesterase type-5 inhibitors (including Adcirca (tadalafil), which is marketed by United Therapeutics Corporation, and Revatio (sildenafil), which is marketed by Pfizer Inc.), endothelin receptor antagonists (including Letairis (ambrisentan), which is marketed by Gilead Sciences, Inc., and Opsumit (macitentan) and Tracleer (bosentan), which are marketed by Actelion) and a soluble guanylate cyclase stimulator (Adempas (riociguat), which is marketed by Bayer HealthCare Pharmaceuticals Inc.). Actelion recently completed a Phase 3 clinical trial of selexipag, an additional potential prostacyclin analog.

There are also other treatments in Phase 1 and Phase 2 clinical development, including other nitric oxide generation and delivery systems, including GeNOsyl, which is being developed by GeNO LLC, and a nebulized formulation of nitrite, which is being developed by Mast Therapeutics.

Currently, there are no approved therapies for treating PH-COPD, and the only generally accepted treatments are long-term oxygen therapy, pulmonary rehabilitation and lung transplant, and we are not aware of any therapies for PH-COPD in advanced clinical development.

There are no generally accepted products approved for structural support to prevent cardiac remodeling following an AMI. Other product candidates that are currently in clinical development include stem cell therapies to restore heart muscle cells following an AMI, with large Phase 3 trials expected to be completed in 2018 or 2019. We do not expect BCM to compete with, or replace, current treatments for congestive heart failure following AMI, but instead believe it will become part of the treatment regimen used in conjunction with other therapies. In addition, because BCM can be delivered by a minimally invasive percutaneous coronary intervention procedure, we do not believe it

will directly compete with devices that are used to treat congestive heart failure, which are designed for administration during open heart surgery or by intra-cardiac injection involving a thoracotomy procedure. These include mesh restraining devices, for example HeartNet; injectable biopolymers, for example Algisyl-LVR; and implantable electro-stimulation devices, for example, CardioFit. In addition, volume reduction surgery or cardiac assist devices, or pumps, are sometimes used to treat patients with congestive heart failure.

## **Patents and Proprietary Rights**

We strive to protect the proprietary technologies that we believe are important to our business, including seeking and maintaining patent protection intended to protect, for example, our product candidates, related technologies and/or other aspects of the inventions that are important to our business. Our owned and licensed patents and patent applications cover patentable subject matter from composition of matter, methods of use, manufacturing processes for BCM and method of administration, devices and device components, critical safety features and design components with respect to INOpulse. However, patent protection is not available for the composition of matter of the active pharmaceutical ingredients in INOpulse since nitric oxide is a naturally occurring molecule.

Actual protection afforded by a patent, which can vary from country to country, depends on the type of patent, the scope of its coverage and the availability of legal remedies in the country. We also rely on trade secrets and careful monitoring of our proprietary information to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection.

We plan to continue to expand our intellectual property estate by filing patent applications directed to inventions which provide additional patent protection for our product offering, for instance, device enhancements, safety features and manufacturing processes. Our success will depend significantly on our ability to obtain and maintain patent and other proprietary protection for commercially important technology, inventions and know-how related to our business; defend and enforce our patents; maintain our licenses to use intellectual property owned by third parties; preserve the confidentiality of our trade secrets; and operate without infringing the valid and enforceable patents and other proprietary rights of third parties. We also consider know-how, continuing technological innovation and in-licensing opportunities to develop, strengthen and maintain our proprietary positions.

A third party may hold intellectual property, including patent rights that are important or necessary to the development of our programs. It may be necessary for us to use the patented or proprietary technology of third parties to commercialize our product candidates, in which case we would be required to obtain a license from these third parties on commercially reasonable terms, or our business could be harmed, possibly materially. For example, if we want to expand the indications for which we could develop and commercialize pulsed nitric oxide beyond PAH, PH-COPD and PH-IPF, we will need to obtain a license from Ikaria.

The patent positions of biotherapeutics companies like us are generally uncertain and involve complex legal, scientific and factual questions. In addition, the coverage claimed in a patent application can be significantly reduced before the patent is issued, and patent scope can be reinterpreted by the courts after issuance. Moreover, many jurisdictions permit third parties to challenge issued patents in administrative proceedings which may result in further narrowing or even cancellation of patent claims. Consequently, we do not know whether any of our product candidates will be protectable or remain protected by enforceable patents. We cannot predict whether the patent applications we are currently pursuing will issue as patents in any particular jurisdiction or whether the claims of any issued patents will provide sufficient protection from competitors. Any patents that we own or license may be challenged, narrowed, circumvented or invalidated by third parties.

Because patent applications in the United States and certain other jurisdictions are maintained in secrecy for 18 months or potentially even longer, and since publication of discoveries in the scientific or

patent literature often lags behind actual discoveries, we cannot be certain of the priority of inventions covered by pending patent applications. Moreover, we may have to participate in interference proceedings declared by the U.S. Patent and Trademark Office, or USPTO, to determine priority of inventions for any patent applications filed with the USPTO on or before March 15, 2013. Likewise, derivation proceedings may also be declared for any patent filings filed after March 15, 2013.

The patents and patent applications that relate to our programs are described below.

### ***INOpulse***

We hold exclusive licenses from Ikaria to 65 patents and pending patent applications in both the United States and foreign countries including Australia, Brazil, Canada, China, Europe, Hong Kong, India, Indonesia, Israel, Japan, Korea, Mexico, the Philippines, Russia and Singapore. Certain patent applications in these families, if issued, will expire as late as 2033. These patent rights have been exclusively licensed for the treatment of patients with PAH, PH-COPD and PH-IPF and cover methods of delivery and the drug delivery device, as well as important safety features and the ornamental design of the drug delivery device.

Our primary basis for patent exclusivity is based on pending and issued in-licensed patents directed to proprietary methods of administering pulsed inhaled nitric oxide, as well as a device for delivering the same. This patent family expires as late as 2027 in the United States and as late as 2026 in Australia, Brazil, Canada, China, Europe, Hong Kong, Japan and Mexico.

We also hold a portfolio of one issued U.S. patent, three pending U.S. patent applications, and two Patent Cooperation Treaty pending patent applications, in each case directed to novel nasal cannula features that we believe are necessary for the accurate, safe and efficacious administration of pulsed nitric oxide. Each of these patents are or, if issued, will be, in-licensed and will expire in 2033 in the United States and abroad.

Another in-licensed patent family relates to features of the drug delivery canister necessary for providing drug product for use with our proprietary pulsing drug delivery device. These three issued Australian patents and 15 pending patent applications in the United States, Brazil, Canada, China, Europe, Hong Kong, India, Indonesia, Israel, Japan, Korea, Mexico, the Philippines, Russia and Singapore, if issued, will expire in 2029. In addition, an issued U.S. patent will expire in 2030. Several other patent families directed to device and safety features are pending as well as several ornamental design patent rights covering both the clinical and intended commercial device design.

In addition, the FDA has granted orphan drug designation to our nitric oxide program for the treatment of PAH, which could result in marketing exclusivity of seven years in the United States should this be the first NDA approved for inhaled nitric oxide in this indication. The active ingredient, nitric oxide, was previously approved by the FDA as a drug in a separate clinical application. Accordingly, any related patent rights will not be eligible for a patent term extension under relevant provisions of the Hatch-Waxman Act.

### ***BCM***

Patent protection of BCM in the United States and in Australia, Canada, China, Europe, Hong Kong, India, Israel, Japan, Korea and Mexico is provided by issued composition of matter and method of treatment patents and patent pending applications, which we in-license from BioLine, that cover the intended commercial product. These issued patents are not limited to treatment of cardiac tissue, affording broad protection for the use of BCM in treating any damaged body tissue. We were notified by the European Patent Office in August 2014 and October 2014 that Notices of Opposition to two European patents covering BCM that we licensed from BioLine have been filed with the European Patent Office. A Notice of Opposition initiates a process during which the European Patent Office can decide to reconsider an issued patent and modify or revoke some or all of the patent claims. We have

the right to respond to the Notices of Opposition before the European Patent Office makes a decision whether or not to re-examine the two patents. We intend to file a response in the near future as we believe the two issued patents were properly examined and appropriately granted by the European Patent Office. Furthermore, we believe the arguments made in the Notices of Opposition misstate the facts and lack scientific merit.

BCM will be regulated as a device and therefore data exclusivity will not be available. However, under the Hatch-Waxman Act, one issued U.S. patent covering the product will be eligible for patent term extension of up to five years to recover patent term lost during clinical trials. Accordingly, if the U.S. composition of matter patent that expires in 2029 is selected for this extension and a patent term extension is granted, certain rights under the patent may not expire until 2032 to 2034, depending on the timing of marketing approval and other factors. Corresponding issued patents in other countries will expire in 2024 and may also be eligible for patent term extensions. We do not expect to be granted a patent term extension for composition of matter patents in Europe, but patent term extensions may be available in other countries such as Japan and Israel.

Additional patents directed to methods of manufacturing, which we in-license from BioLine, as well as patent applications relating to methods of manufacturing we developed and own, if issued, will expire, as late as 2032. Method of manufacturing in-licensed patents have issued in the United States, Australia, China, Europe, India, Israel, Korea and Mexico and are pending in Canada, with the U.S. issued patents expiring in 2025 and the non-U.S. issued patents expiring in 2024. The method of manufacturing patent applications we developed and own, if issued, will expire in the United States, Canada and Europe in 2032, not including any applicable patent term adjustment. Further, there is no abbreviated clinical trial pathway, such as an abbreviated new drug application, or ANDA, or a 505(b)(2) new drug application, for a device product approved via a PMA pathway.

#### *Patent Term*

The base term of a U.S. patent is 20 years from the filing date of the earliest-filed non-provisional patent application from which the patent claims priority. The term of a U.S. patent can be lengthened by patent term adjustment, which compensates the owner of the patent for administrative delays at the USPTO. In some cases, the term of a U.S. patent is shortened by terminal disclaimer that reduces its term to that of an earlier-expiring patent.

The term of a U.S. patent may be eligible for patent term extension under the Hatch-Waxman Act to account for at least some of the time the drug or device is under development and regulatory review after the patent is granted. With regard to a drug or device for which FDA approval is the first permitted marketing of the active ingredient, the Hatch-Waxman Act allows for extension of the term of one U.S. patent. Thus, patent term extension is not available for INOpulse since the active moiety is nitric oxide, which is already subject to an approved NDA. The extended patent term cannot exceed the shorter of five years beyond the non-extended expiration of the patent or 14 years from the date of the FDA approval of the drug or device. Some foreign jurisdictions have analogous patent term extension provisions that allow for extension of the term of a patent that covers a device approved by the applicable foreign regulatory agency. In the future, if and when BCM receives FDA approval, we expect to apply for a patent term extension on the patent covering BCM that we believe will provide the best exclusivity position if extended.

#### *Trade Secrets*

In addition to patents, we rely on trade secrets and know-how to develop and maintain our competitive position. We typically rely on trade secrets to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection. For example, elements of the manufacture of our products are based on trade secrets and know-how that are not publicly disclosed. We protect trade secrets and know-how by establishing confidentiality agreements and

invention assignment agreements with our employees, consultants, scientific advisors, contractors and commercial partners. These agreements provide that all confidential information developed or made known during the course of an individual or entity's relationship with us must be kept confidential during and after the relationship. These agreements also provide that all inventions resulting from work performed for us or relating to our business and conceived or completed during the period of employment or assignment, as applicable, shall be our exclusive property. In addition, we take other appropriate precautions, such as physical and technological security measures, to guard against misappropriation of our proprietary technology by third parties.

### *Trademarks*

We also seek trademark protection in the United States and in foreign jurisdictions where available and when appropriate. The symbol <sup>TM</sup> indicates a common law trademark. Other service marks, trademarks and trade names appearing in this prospectus are the property of their respective owners.

### **Government Regulation**

Government authorities in the United States, at the federal, state and local level, and in other countries and jurisdictions, including the European Union, extensively regulate, among other things, the research, development, testing, manufacture, quality control, clearance, approval, packaging, storage, recordkeeping, labeling, advertising, promotion, distribution, marketing, post-approval monitoring and reporting, and import and export of pharmaceutical products and medical devices. The processes for obtaining marketing approvals in the United States and in foreign countries and jurisdictions, along with subsequent compliance with applicable statutes and regulations and other regulatory authorities, require the expenditure of substantial time and financial resources.

### ***Review and Approval of Drugs in the United States***

In the United States, the FDA regulates drugs under the Food, Drug, and Cosmetic Act, or FDCA, and implementing regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval may subject an applicant and/or sponsor to a variety of administrative or judicial sanctions, including refusal by the FDA to approve pending applications, withdrawal of an approval, imposition of a clinical hold, issuance of warning letters and other types of letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement of profits, or civil or criminal investigations and penalties brought by the FDA and the Department of Justice or DOJ or other governmental entities.

Our product candidates must be approved by the FDA through the NDA process before they may be legally marketed in the United States. An applicant seeking approval to market and distribute a new drug product in the United States must typically undertake the following:

- completion of pre-clinical laboratory tests, animal studies and formulation studies in compliance with the FDA's good laboratory practice, or GLP, regulations;
- submission to the FDA of an IND, which must take effect before human clinical trials may begin;
- approval by an independent institutional review board, or IRB, representing each clinical site before each clinical trial may be initiated;

- performance of adequate and well-controlled human clinical trials in accordance with good clinical practices, or GCP, to establish the safety and efficacy of the proposed drug product for each indication;
- preparation and submission to the FDA of an NDA;
- review of the product by an FDA advisory committee, where appropriate or if applicable;
- satisfactory completion of one or more FDA inspections of the manufacturing facility or facilities at which the product, or components thereof, are produced to assess compliance with cGMP requirements and to assure that the facilities, methods and controls are adequate to preserve the product's identity, strength, quality and purity;
- payment of user fees and securing FDA approval of the NDA; and
- compliance with any post-approval requirements, including Risk Evaluation and Mitigation Strategies, or REMS, and post-approval studies required by the FDA.

#### *Pre-Clinical Studies*

Pre-clinical studies include laboratory evaluation of the purity and stability of the manufactured drug substance or active pharmaceutical ingredient and the formulated drug or drug product, as well as *in vitro* and animal studies to assess the safety and activity of the drug for initial testing in humans and to establish a rationale for therapeutic use. The conduct of pre-clinical studies is subject to federal regulations and requirements, including GLP regulations. The results of the pre-clinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical studies, among other things, are submitted to the FDA as part of an IND.

Companies usually must complete some long-term pre-clinical testing, such as animal tests of reproductive adverse events and carcinogenicity, and must also develop additional information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the drug in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the drug candidate and, among other things, the manufacturer must develop methods for testing the identity, strength, quality and purity of the final drug product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the drug candidate does not undergo unacceptable deterioration over its shelf life.

#### *Human Clinical Studies in Support of an NDA*

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators in accordance with GCP requirements, which include, among other things, the requirement that all research subjects provide their informed consent in writing before their participation in any clinical trial. Clinical trials are conducted under written study protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A protocol for each clinical trial and any subsequent protocol amendments must be submitted to the FDA as part of the IND. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to a proposed clinical trial and places the trial on clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. Accordingly, submission of an IND may or may not result in the FDA allowing clinical trials to commence.

In addition, an IRB representing each institution participating in the clinical trial must review and approve the plan for any clinical trial before it commences at that institution, and the IRB must conduct continuing review and reapprove the study at least annually. The IRB must review and approve, among other things, the study protocol and informed consent information to be provided to study subjects. An IRB must operate in compliance with FDA regulations. Information about certain clinical trials must be submitted within specific timeframes to the National Institutes of Health for public dissemination on their ClinicalTrials.gov website.

A sponsor who wishes to conduct a clinical trial outside the United States may, but need not, obtain FDA authorization to conduct the clinical trial under an IND. If a foreign clinical trial is not conducted under an IND, the sponsor may submit data from the clinical trial to the FDA in support of an NDA or IND so long as the clinical trial is conducted in compliance with GCP, and the FDA is able to validate the data from the study through an onsite inspection if the agency deems it necessary.

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

- Phase 1: The drug is initially introduced into a small number of healthy human subjects or patients with the target disease (e.g. cancer) or condition and tested for safety, dosage tolerance, absorption, metabolism, distribution, excretion and, if possible, to gain an early indication of its effectiveness and to determine optimal dosage.
- Phase 2: The drug is administered to a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance and optimal dosage.
- Phase 3: Phase 3 clinical trials are commonly referred to as "pivotal" studies, which typically denotes a study which presents the data that the FDA or other relevant regulatory agency will use to determine whether or not to approve a drug. In Phase 3 clinical trials, the drug is administered to an expanded patient population, generally at geographically dispersed clinical trial sites, in well-controlled clinical trials to generate enough data to statistically evaluate the efficacy and safety of the product for approval, to establish the overall risk-benefit profile of the product, and to provide adequate information for the labeling of the product.

Progress reports detailing the results of the clinical trials must be submitted at least annually to the FDA and more frequently if serious adverse events occur. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, or at all. Furthermore, the FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution, or an institution it represents, if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients. The FDA will typically inspect one or more clinical sites to assure compliance with GCP and the integrity of the clinical data submitted.

#### *Section 505(b)(2) NDAs*

NDAs for most new drug products are based on two full clinical studies which must contain substantial evidence of the safety and efficacy of the proposed new product. These applications are submitted under Section 505(b)(1) of the FDCA. The FDA is, however, authorized to approve an alternative type of NDA under Section 505(b)(2) of the FDCA. This type of application allows the applicant to rely, in part, on the FDA's previous findings of safety and efficacy for a similar product, or published literature. Specifically, Section 505(b)(2) applies to NDAs for a drug for which the investigations made to show whether or not the drug is safe for use and effective in use and relied upon by the applicant for approval of the application "were not conducted by or for the applicant and



for which the applicant has not obtained a right of reference or use from the person by or for whom the investigations were conducted."

Thus, Section 505(b)(2) authorizes the FDA to approve an NDA based on safety and effectiveness data that were not developed by the applicant. NDAs filed under Section 505(b)(2) may provide an alternate and potentially more expeditious pathway to FDA approval for new or improved formulations or new uses of previously approved products. If the 505(b)(2) applicant can establish that reliance on the FDA's previous approval is scientifically appropriate, the applicant may eliminate the need to conduct certain pre-clinical or clinical studies of the new product. The FDA may also require companies to perform additional studies or measurements to support the change from the approved product. The FDA may then approve the new drug candidate for all or some of the label indications for which the referenced product has been approved, as well as for any new indication sought by the Section 505(b)(2) applicant.

#### *Submission of an NDA to the FDA*

NDAs for most new drug products are based on two full clinical studies that must contain substantial evidence of the safety and efficacy of the proposed new product. Assuming successful completion of required clinical testing and other requirements, the results of the pre-clinical and clinical studies, together with detailed information relating to the product's chemistry, manufacture, controls and proposed labeling, among other things, are submitted to the FDA as part of an NDA requesting approval to market the drug product for one or more indications. Under federal law, the submission of most NDAs is additionally subject to an application user fee, currently exceeding \$2.1 million, and the sponsor of an approved NDA is also subject to annual product and establishment user fees, currently exceeding \$104,000 per product and \$554,000 per establishment. These fees are typically increased annually.

The FDA conducts a preliminary review of an NDA within 60 days of its receipt and informs the sponsor by the 74th day after the FDA's receipt of the submission whether the application is sufficiently complete to permit substantive review. The FDA may request additional information rather than accept an NDA for filing. In this event, the application must be resubmitted with the additional information. The resubmitted application is also subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review. The FDA has agreed to specified performance goals in the review process of NDAs. Most such applications are meant to be reviewed within ten months from the date of filing, and most applications for "priority review" products are meant to be reviewed within six months of filing. The review process may be extended by the FDA for various reasons, including for three additional months to consider new information or clarification provided by the applicant to address an outstanding deficiency identified by the FDA following the original submission.

Before approving an NDA, the FDA typically will inspect the facility or facilities where the product is or will be manufactured. These pre-approval inspections cover all facilities associated with an NDA submission, including drug component manufacturing (such as Active Pharmaceutical Ingredients), finished drug product manufacturing, and control testing laboratories. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving an NDA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP.

The FDA may refer an application for a novel drug to an advisory committee or explain why such referral was not made. Typically, an advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the

recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

#### *Accelerated Approval Pathway*

The FDA may grant accelerated approval to a drug for a serious or life-threatening condition that provides meaningful therapeutic advantage to patients over existing treatments based upon a determination that the drug has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit. The FDA may also grant accelerated approval for such a condition when the product has an effect on an intermediate clinical endpoint that can be measured earlier than an effect on irreversible morbidity or mortality, or IMM, and that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. Drugs granted accelerated approval must meet the same statutory standards for safety and effectiveness as those granted traditional approval.

For the purposes of accelerated approval, a surrogate endpoint is a marker, such as a laboratory measurement, radiographic image, physical sign, or other measure that is thought to predict clinical benefit, but is not itself a measure of clinical benefit. Surrogate endpoints can often be measured more easily or more rapidly than clinical endpoints. An intermediate clinical endpoint is a measurement of a therapeutic effect that is considered reasonably likely to predict the clinical benefit of a drug, such as an effect on IMM. The FDA has limited experience with accelerated approvals based on intermediate clinical endpoints, but has indicated that such endpoints generally may support accelerated approval where the therapeutic effect measured by the endpoint is not itself a clinical benefit and basis for traditional approval, if there is a basis for concluding that the therapeutic effect is reasonably likely to predict the ultimate clinical benefit of a drug.

The accelerated approval pathway is most often used in settings in which the course of a disease is long and an extended period of time is required to measure the intended clinical benefit of a drug, even if the effect on the surrogate or intermediate clinical endpoint occurs rapidly. The accelerated approval pathway is usually contingent on a sponsor's agreement to conduct, in a diligent manner, additional post-approval confirmatory studies to verify and describe the drug's clinical benefit. As a result, a product candidate approved on this basis is subject to rigorous post-marketing compliance requirements, including the completion of Phase 4 or post-approval clinical trials to confirm the effect on the clinical endpoint. Failure to conduct required post-approval studies, or confirm a clinical benefit during post-marketing studies, would allow the FDA to withdraw the drug from the market on an expedited basis. All promotional materials for product candidates approved under accelerated regulations are subject to prior review by the FDA.

#### *The FDA's Decision on an NDA*

On the basis of the FDA's evaluation of the NDA and accompanying information, including the results of the inspection of the manufacturing facilities, the FDA may issue an approval letter or a complete response letter. An approval letter authorizes commercial marketing of the product with specific prescribing information for specific indications. 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 and 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. Even with submission of this additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

If the FDA approves a product, it may limit the approved indications for use for the product, require that contraindications, warnings or precautions be included in the product labeling, require that post-approval studies, including Phase 4 clinical trials, be conducted to further assess the drug's safety after approval, require testing and surveillance programs to monitor the product after commercialization, or impose other conditions which can materially affect the potential market and profitability of the product. In addition, as a condition of approval, the FDA may require an applicant to develop a REMS. REMS use risk minimization strategies beyond the professional labeling to ensure that the benefits of the product outweigh the potential risks. To determine whether a REMS is needed, the FDA will consider the size of the population likely to use the product, seriousness of the disease, expected benefit of the product, expected duration of treatment, seriousness of known or potential adverse events, and whether the product is a new molecular entity. REMS can include medication guides, physician communication plans for healthcare professionals, and elements to assure safe use, or ETASU. ETASU may 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 FDA may require a REMS before approval or post-approval if it becomes aware of a serious risk associated with use of the product. The requirement for a REMS can materially affect the potential market and profitability of a product.

The FDA may prevent or limit further marketing of a product based on the results of post-market studies or surveillance programs. After approval, many types of changes to the approved product, such as adding new indications, manufacturing changes and additional labeling claims, are subject to further testing requirements and FDA review and approval.

#### *Post-Approval Requirements*

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

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

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

distribution or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters or holds on post-approval clinical trials;
- refusal of the FDA to approve pending NDAs or supplements to approved NDAs, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products; or
- injunctions or the imposition of civil or criminal penalties.

The FDA strictly regulates marketing, labeling, advertising and promotion of products that are placed on the market. Drugs may be promoted only for the approved indications and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability.

In addition, the distribution of prescription pharmaceutical products is subject to the Prescription Drug Marketing Act, or PDMA, which regulates the distribution of drugs and drug samples at the federal level, and sets minimum standards for the registration and regulation of drug distributors by the states. Both the PDMA and state laws limit the distribution of prescription pharmaceutical product samples and impose requirements to ensure accountability in distribution.

#### *Abbreviated New Drug Applications for Generic Drugs*

In 1984, with passage of the Hatch-Waxman Amendments to the FDCA, Congress authorized the FDA to approve generic drugs that are the same as drugs previously approved by the FDA under the NDA provisions of the statute. To obtain approval of a generic drug, an applicant must submit an ANDA to the agency. In support of such applications, a generic manufacturer may rely on the pre-clinical and clinical testing previously conducted for a drug product previously approved under an NDA, known as the reference listed drug, or RLD.

Specifically, in order for an ANDA to be approved, the FDA must find that the generic version is identical to the RLD with respect to the active ingredients, the route of administration, the dosage form, and the strength of the drug. At the same time, the FDA must also determine that the generic drug is "bioequivalent" to the innovator drug. Under the statute, a generic drug is bioequivalent to a RLD if the rate and extent of absorption of the drug do not show a significant difference from the rate and extent of absorption of the listed drug.

Upon approval of an ANDA, the FDA indicates whether the generic product is "therapeutically equivalent" to the RLD in its publication "Approved Drug Products with Therapeutic Equivalence Evaluations," also referred to as the "Orange Book." Physicians and pharmacists consider a therapeutic equivalent generic drug to be fully substitutable for the RLD. In addition, by operation of certain state laws and numerous health insurance programs, the FDA's designation of therapeutic equivalence often results in substitution of the generic drug without the knowledge or consent of either the prescribing physician or patient.

Under the Hatch-Waxman Amendments, the FDA may not approve an ANDA until any applicable period of non-patent exclusivity for the RLD has expired. The FDCA provides a period of five years of non-patent data exclusivity for a new drug containing a new chemical entity. In cases where such exclusivity has been granted, an ANDA may not be filed with the FDA until the expiration of five years unless the submission is accompanied by a Paragraph IV certification, in which case the applicant may

submit its application four years following the original product approval. The FDCA also provides for a period of three years of exclusivity if the NDA includes reports of one or more new clinical investigations, other than bioavailability or bioequivalence studies, that were conducted by or for the applicant and are essential to the approval of the application. This three-year exclusivity period often protects changes to a previously approved drug product, such as a new dosage form, route of administration, combination or indication.

#### *Hatch-Waxman Patent Certification and the 30-Month Stay*

Upon approval of an NDA or a supplement thereto, NDA sponsors are required to list with the FDA each patent with claims that cover the applicant's product or an approved method of using the product. Each of the patents listed by the NDA sponsor is published in the Orange Book. When an ANDA applicant files its application with the FDA, the applicant is required to certify to the FDA concerning any patents listed for the reference product in the Orange Book, except for patents covering methods of use for which the ANDA applicant is not seeking approval. To the extent that the Section 505(b)(2) applicant is relying on studies conducted for an already approved product, the applicant is required to certify to the FDA concerning any patents listed for the approved product in the Orange Book to the same extent that an ANDA applicant would.

Specifically, the applicant must certify with respect to each patent that:

- the required patent information has not been filed;
- the listed patent has expired;
- the listed patent has not expired, but will expire on a particular date and approval is sought after patent expiration; or
- the listed patent is invalid, unenforceable or will not be infringed by the new product.

A certification that the new product will not infringe the already approved product's listed patents or that such patents are invalid or unenforceable is called a Paragraph IV certification. If the applicant does not challenge the listed patents or indicate that it is not seeking approval of a patented method of use, the ANDA application will not be approved until all the listed patents claiming the referenced product have expired.

If the ANDA applicant or 505(b)(2) 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 accepted for filing 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 after the receipt of a Paragraph IV certification automatically prevents the FDA from approving the ANDA until the earlier of 30 months after the receipt of the Paragraph IV notice, expiration of the patent, or a decision in the infringement case that is favorable to the ANDA applicant.

#### *Orphan Designation and Exclusivity*

Under the Orphan Drug Act, FDA may designate a drug product as an "orphan drug" if it is intended to treat a rare disease or condition (generally meaning that it affects fewer than 200,000 individuals in the United States, or more in cases in which there is no reasonable expectation that the cost of developing and making a drug product available in the United States for treatment of the disease or condition will be recovered from sales of the product). A company must request orphan product designation before submitting a NDA. If the request is granted, FDA will disclose the identity of the therapeutic agent and its potential use. Orphan product designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

If a product with orphan status receives the first FDA approval for the disease or condition for which it has such designation, the product will be entitled to orphan product exclusivity. Orphan product exclusivity means that FDA may not approve any other applications for the same product for the same indication for seven years, except in certain limited circumstances. Competitors may receive approval of different products for the indication for which the orphan product has exclusivity and may obtain approval for the same product but for a different indication. If a drug or drug product designated as an orphan product ultimately receives marketing approval for an indication broader than what was designated in its orphan product application, it may not be entitled to exclusivity.

#### *Pediatric Studies and Exclusivity*

Under the Pediatric Research Equity Act of 2003, a NDA or supplement thereto must contain data that are adequate to assess the safety and effectiveness of the drug product for the claimed indications in all relevant pediatric subpopulations, and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. With enactment of the Food and Drug Administration Safety and Innovation Act, or FDASIA, in 2012, sponsors must also submit pediatric study plans prior to the assessment data. Those plans must contain an outline of the proposed pediatric study or studies the applicant plans to conduct, including study objectives and design, any deferral or waiver requests, and other information required by regulation. The applicant, the FDA, and the FDA's internal review committee must then review the information submitted, consult with each other, and agree upon a final plan. The FDA or the applicant may request an amendment to the plan at any time.

The FDA may, on its own initiative or at the request of the applicant, grant deferrals for submission of some or all pediatric data until after approval of the product for use in adults, or full or partial waivers from the pediatric data requirements. Additional requirements and procedures relating to deferral requests and requests for extension of deferrals are contained in FDASIA.

Pediatric exclusivity is another type of non-patent marketing exclusivity in the United States and, if granted, provides for the attachment of an additional six months of marketing protection to the term of any existing regulatory exclusivity, including the non-patent exclusivity. This six-month exclusivity may be granted if an NDA sponsor submits pediatric data that fairly respond to a written request from the FDA for such data. The data do not need to show the product to be effective in the pediatric population studied; rather, if the clinical trial is deemed to fairly respond to the FDA's request, the additional protection is granted. If reports of requested pediatric studies are submitted to and accepted by the FDA within the statutory time limits, whatever statutory or regulatory periods of exclusivity or patent protection cover the product are extended by six months. This is not a patent term extension, but it effectively extends the regulatory period during which the FDA cannot approve another application.

#### *Patent Term Restoration and Extension*

A patent claiming a new drug product or medical device may be eligible for a limited patent term extension under the Hatch-Waxman Act, which permits a patent restoration of up to five years for patent term lost during product development and the FDA regulatory review. The restoration period granted on a patent covering a new drug product or a Class III medical device is typically one-half the time between the date a clinical investigation on human beings is begun and the submission date of an application for premarket approval of the product or medical device, plus the time between the submission date of an application for approval of the product or medical device and the ultimate approval date. Patent term restoration cannot be used to extend the remaining term of a patent past a total of 14 years from the product's approval date. Only one patent applicable to an approved drug product or medical device is eligible for the extension, and the application for the extension must be submitted prior to the expiration of the patent in question. A patent that covers multiple drugs or medical devices for which approval is sought can only be extended in connection with one of the

approvals. The USPTO reviews and approves the application for any patent term extension or restoration in consultation with the FDA.

### ***Review and Approval of Medical Devices in the United States***

Medical devices in the United States are strictly regulated by the FDA. Under the FDCA a medical device is defined as an instrument, apparatus, implement, machine, contrivance, implant, *in vitro* reagent, or other similar or related article, including a component, part or accessory which is, among other things: 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 intended to affect the structure or any function of the body of man or other animals, and which does not achieve 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. This definition provides a clear distinction between a medical device and other FDA regulated products such as drugs. If the primary intended use of the product is achieved through chemical action or by being metabolized by the body, the product is usually a drug. If not, it is generally a medical device.

Unless an exemption applies, a new medical device may not be marketed in the United States unless and until it has been cleared through filing of a 510(k) premarket notification, or 510(k), or approved by the FDA pursuant to a PMA. The information that must be submitted to the FDA in order to obtain clearance or approval to market a new medical device varies depending on how the medical device is classified by the FDA. Medical devices are classified into one of three classes on the basis of the controls deemed by the FDA to be necessary to reasonably ensure their safety and effectiveness.

Class I devices are those low risk devices for which reasonable assurance of safety and effectiveness can be provided by adherence to the FDA's general controls for medical devices, which include applicable portions of the FDA's Quality System Regulation, or QSR, facility registration and product listing, reporting of adverse medical events and malfunctions and appropriate, truthful and non-misleading labeling, advertising and promotional materials. Many Class I devices are exempt from premarket regulation; however, some Class I devices require premarket clearance by the FDA through the 510(k) premarket notification process.

Class II devices are moderate risk devices and are subject to the FDA's general controls, and any other special controls, such as performance standards, post-market surveillance, and FDA guidelines, deemed necessary by the FDA to provide reasonable assurance of the devices' safety and effectiveness. Premarket review and clearance by the FDA for Class II devices are accomplished through the 510(k) premarket notification procedure, although some Class II devices are exempt from the 510(k) requirements. Premarket notifications are subject to user fees, unless a specific exemption applies.

Class III devices are deemed by the FDA to pose the greatest risk, such as those for which reasonable assurance of the device's safety and effectiveness cannot be assured solely by the general controls and special controls described above and that are life-sustaining or life-supporting. A PMA application must provide valid scientific evidence, typically extensive pre-clinical and clinical trial data and information about the device and its components regarding, among other things, device design, manufacturing and labeling. PMA applications (and supplemental PMA applications) are subject to significantly higher user fees than are 510(k) premarket notifications.

### ***Clinical Studies in Support of Development of a Medical Device***

The types of clinical studies required for the development and approval of a medical device differ from those required for drug products. Clinical trials involving a drug product typically involve a sequential process of Phase 1, 2 and 3 clinical trials to test for the safety and efficacy of the product. The clinical development of a medical device, on the other hand, is often conducted in three different

sequential phases, which may overlap or be combined. Those phases are a pilot study, which may also be referred to as an early feasibility study; a feasibility study; and a pivotal study.

- **Pilot Study:** A pilot study is a limited clinical investigation of a device early in development, typically before the device design has been finalized, for a specific indication. It may be used to evaluate the device design concept with respect to initial clinical safety and device functionality in a small number of subjects (generally fewer than ten initial subjects) when this information cannot practically be provided through additional nonclinical assessments or appropriate nonclinical tests are unavailable. Information obtained from a pilot study may guide device modifications.
- **Feasibility Study:** A feasibility study is a clinical investigation that is commonly used to capture preliminary safety and effectiveness information on a near-final or final device design to adequately plan an appropriate pivotal study. Because the study of a near-final or final device design takes place later in development than a pilot study, the FDA has indicated that it expects to see more nonclinical (or prior clinical) data in a feasibility study IDE application. A feasibility study does not necessarily need to be preceded by a pilot study.
- **Pivotal Study:** A pivotal study is a clinical investigation designed to collect definitive evidence of the safety and effectiveness of a device for a specified intended use, typically in a statistically justified number of subjects. Evidence from one or more pivotal clinical studies generally serves as the primary basis for the determination of reasonable assurance of safety and effectiveness of the medical device of a PMA and FDA's overall benefit-risk determination. A pivotal study may or may not be preceded by a pilot study or feasibility study.

These three stages in the development of a medical device may be dependent on each other and conducting a thorough evaluation in one stage can make the next stage more straightforward. To determine which type of clinical study is appropriate to pursue, a manufacturer will consider several factors, such as the novelty of the device, the device's intended clinical use, the stability of the device design and the amount of test data available to support the IDE application. A pilot study is appropriate when device changes are expected and when, due to the novelty of the device or its intended use, a clinical study is expected to provide information that cannot be practically obtained through additional nonclinical assessments. A pilot study may also be appropriate even if a device or a prototype of the device has previously been used clinically for the intended clinical use. A feasibility study or a pivotal study may be more appropriate if the device design is near-final or final, respectively, depending on the amount of data available to justify the study.

#### *510(k) Premarket Notification*

To obtain 510(k) clearance, a manufacturer must submit a premarket notification demonstrating that the proposed device is "substantially equivalent" to a predicate device, which is a previously cleared 510(k) device or a pre-amendment device that was in commercial distribution before May 28, 1976, for which the FDA has not yet called for the submission of a PMA application. The FDA's 510(k) clearance pathway usually takes from three to 12 months from the date the application is submitted and filed with the FDA, but it can take significantly longer and clearance is never assured. The FDA has issued guidance documents meant to expedite review of a 510(k) and facilitate interactions between applicants and the agency. To demonstrate substantial equivalence, a manufacturer must show that the device has the same intended use as a predicate device and the same technological characteristics, or the same intended use and different technological characteristics and does not raise new questions of safety and effectiveness than the predicate device. Most 510(k)s do not require clinical data for clearance, but the FDA may request such data.

The FDA seeks to review and act on a 510(k) within 90 days of submission, but it may take longer if the agency finds that it requires more information to review the 510(k). If the FDA determines that



the device is substantially equivalent to a predicate device, the subject device may be marketed. However, if the FDA concludes that a new device is not substantially equivalent to a predicate device, the new device will be classified in Class III and the manufacturer will be required to submit a PMA to market the product. Devices of a new type that the FDA has not previously classified based on risk are automatically classified into Class III by operation of section 513(f)(1) of the FDCA, regardless of the level of risk they pose. To avoid requiring PMA review of low- to moderate-risk devices classified in Class III by operation of law, Congress enacted section 513(f)(2) of the FDCA. This provision allows the FDA to classify a low- to moderate-risk device not previously classified into Class I or II, a process known as the *de novo* process. A company may apply directly to the FDA for classification of its device as *de novo* or may submit a *de novo* petition within 30 days of receiving a not substantially equivalent determination.

Modifications to a 510(k)-cleared medical device may require the submission of another 510(k). Modifications to a 510(k)-cleared device frequently require the submission of a traditional 510(k), but modifications meeting certain conditions may be candidates for FDA review under a special 510(k). If a device modification requires the submission of a 510(k), but the modification does not affect the intended use of the device or alter the fundamental technology of the device, then summary information that results from the design control process associated with the cleared device can serve as the basis for clearing the application. A special 510(k) allows a manufacturer to declare conformance to design controls without providing new data. When the modification involves a change in material, the nature of the "new" material will determine whether a traditional or special 510(k) is necessary.

Any modification to a 510(k)-cleared product that would constitute a major change in its intended use or any change that could significantly affect the safety or effectiveness of the device may, in some circumstances, require the submission of a PMA, if the change raises complex or novel scientific issues or the product has a new intended use. A manufacturer may be required to submit extensive pre-clinical and clinical data depending on the nature of the changes.

The FDA requires every manufacturer to make the determination regarding the need for a new 510(k) submission in the first instance, but the FDA may review any manufacturer's decision. If the FDA disagrees with the manufacturer's determination and requires new 510(k) clearances or PMA approvals for modifications to previously cleared products for which the manufacturer concluded that new clearances or approvals are unnecessary, the manufacturer may be required to cease marketing or distribution of the products or to recall the modified product until it obtains clearance or approval, and the manufacturer may be subject to significant regulatory fines or penalties. In addition, the FDA is currently evaluating the 510(k) process and may make substantial changes to industry requirements.

#### *Premarket Approval Application*

The PMA process for approval to market a medical device is more complex, costly, and time consuming than the 510(k) clearance procedure. A PMA must be supported by extensive data, including technical information regarding device design and development, pre-clinical studies, clinical studies, manufacturing and controls information and labeling information, that demonstrates the safety and effectiveness of the device for its intended use. After a PMA is submitted, the FDA has 45 days to determine whether it is sufficiently complete to permit a substantive review. If the PMA is complete, the FDA will file the PMA. If the FDA accepts the application for filing, the agency will begin an in-depth substantive review of the application. By statute, the FDA has 180 days to review the application although, generally, review of the application often takes between one and three years, and may take significantly longer. If the FDA has questions, it will likely issue a first major deficiency letter within 150 days of filing. It may also refer the PMA to an FDA advisory panel for additional review, and will conduct a pre-approval inspection of the manufacturing facility to ensure compliance with the QSR, either of which could extend the 180-day response target. In addition, the FDA may request additional information or request the performance of additional clinical trials in which case the PMA approval may be delayed while the trials are conducted and the data acquired are submitted in an amendment to the PMA. Even with additional trials, the FDA may not approve the PMA application.

If the FDA's evaluations of both the PMA and the manufacturing facilities are favorable, the FDA will either issue an approval letter authorizing commercial marketing or an approvable letter that usually contains a number of conditions that must be met in order to secure final approval. If the FDA's evaluations are not favorable, the FDA will deny approval of the PMA or issue a not approvable letter. The PMA process, including the gathering of clinical and nonclinical data and the submission to and review by the FDA, can take several years, and the process can be expensive and uncertain. Moreover, even if the FDA approves a PMA, the FDA may approve the device with an indication that is narrower or more limited than originally sought. The FDA can impose post-approval conditions that it believes necessary to ensure the safety and effectiveness of the device, including, among other things, restrictions on labeling, promotion, sale and distribution. After approval of a PMA, a new PMA or PMA supplement may be required for a modification to the device, its labeling, or its manufacturing 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. The time for review of a PMA supplement may vary depending on the type of change, but it can be lengthy. In addition, in some cases the FDA might require additional clinical data.

#### *Investigational Device Exemption*

A clinical trial is typically required for a PMA and, in a small percentage of cases, the FDA may require a clinical study in support of a 510(k) submission. A manufacturer that wishes to conduct a clinical study involving the device is subject to the FDA's IDE regulation. The IDE regulation distinguishes between significant and nonsignificant risk device studies and the procedures for obtaining approval to begin the study differ accordingly. Also, some types of studies are exempt from the IDE regulations.

Significant risk devices are, among other things, devices that are substantially important in diagnosing, curing, mitigating, or treating disease or in preventing impairment to human health and present a potential for serious risk to the health, safety or welfare of a subject. Studies of devices that pose a significant risk require both FDA and an IRB approval prior to initiation of a clinical study. Nonsignificant risk devices are devices that do not pose a significant risk to the human subjects. A nonsignificant risk device study requires only IRB approval prior to initiation of a clinical study.

An IDE application must be supported by appropriate data, such as animal and laboratory testing results, showing that it is safe to test the device in humans and that the testing protocol is scientifically sound. An IDE application is considered approved 30 days after it has been received by the FDA, unless the FDA otherwise informs the sponsor prior to 30 calendar days from the date of receipt that the IDE is approved, approved with conditions, or disapproved. The FDA typically grants IDE approval for a specified number of subjects to be enrolled at specified study centers. The clinical trial must be conducted in accordance with applicable regulations, including but not limited to the FDA's IDE regulations and GCP. The investigators must obtain subject informed consent, rigorously follow the investigational plan and study protocol, control the disposition of investigational devices, and comply with all reporting and record keeping requirements. A clinical trial may be suspended or terminated by the FDA, the IRB or the sponsor at any time for various reasons, including a belief that the risks to the study participants outweigh the benefits of participation in the trial. Approval of an IDE does not bind the FDA to accept the results of the trial as sufficient to prove the product's safety and efficacy, even if the trial meets its intended success criteria.

#### *Humanitarian Use Device*

When a medical device is intended to treat or diagnose a disease or condition that affects or is manifested in fewer than 4,000 individuals in the United States per year, a manufacturer may seek

approval through a humanitarian device exemption, or HDE, application to market its product as a humanitarian use device, or HUD. This pathway provides an incentive for the development of devices for the treatment or diagnosis of diseases affecting small populations and where a manufacturer's research and development costs could exceed market return. Thus, the purpose of the HDE is to encourage device manufacturers to develop devices for rare conditions or diseases.

Prior to submitting the HDE application the device manufacturer must request HUD designation from the FDA's Office of Orphan Products Development. The FDA seeks to respond to the request within 45 days of submission. If granted, a manufacturer may file an HDE application for HUD approval.

An HDE application is similar to a PMA application but is exempt from the effectiveness requirements of a PMA. In submitting an HDE application a manufacturer is not required to include scientifically valid clinical investigation results demonstrating that the device is effective for its intended purpose. However, the application must contain sufficient information for the FDA to determine that the device does not pose an unreasonable or significant risk of illness or injury, and that the probable benefit to health outweighs the risk of injury or illness from its use, taking into account the probable risks and benefits of currently available devices or alternative forms of treatment. The manufacturer must also demonstrate that no comparable devices are available to treat or diagnose the disease or condition, and that the manufacturer could not otherwise bring the device to market. The FDA seeks to act on an HDE application within 75 days after accepting the HDE for filing.

If the FDA approves the HDE, the manufacturer may market the HUD. However, an HUD may only be used in facilities that have established an IRB to supervise clinical testing of devices and after an IRB has approved the use of the device to treat or diagnose the specific disease. HUDs are also subject to specific labeling requirements identifying the device as a HUD device and noting that although the device is authorized by the FDA, the effectiveness of the device for the specific indication has not been demonstrated. Moreover, a manufacturer cannot charge an amount for an HDE approved device that exceeds the costs of research and development, fabrication, and distribution.

#### *Expedited Access PMA*

The FDA has proposed a program to provide earlier access to high-risk medical devices that are intended to treat or diagnose patients with serious conditions whose medical needs are unmet by current technology. The Expedited Access Premarket Approval Application for Unmet Medical Needs for Life Threatening or Irreversibly Debilitating Diseases or Conditions program, or "Expedited Access PMA" or "EAP," allows for earlier and more interactive engagement with FDA staff. It also involves senior FDA management and a collaboratively developed plan for collecting scientific and clinical data to support approval—taken together, these features are meant to provide patients with earlier access to safe and effective medical devices by reducing the time associated with product development.

To be eligible for participation in the program, the medical device must be intended to treat or diagnose a life-threatening or irreversibly-debilitating disease or condition and represent one of the following:

- no approved alternative treatment exists;
- a breakthrough technology that provides a clinically meaningful advantage over existing technology;
- offers a significant, clinically meaningful advantage over existing approved alternatives; or
- availability of the device is in the patient's best interest.

The EAP must be accompanied by an acceptable data development plan that has been approved by the FDA. When utilizing the EAP program, the FDA will continue to apply the current approval standard of demonstrating a reasonable assurance of safety and efficacy.

#### *Post-Marketing Restrictions and Enforcement*

After a device is placed on the market, numerous regulatory requirements apply. These include, but are not limited to:

- submitting and updating establishment registration and device listings with the FDA;
- compliance with the QSR, which requires manufacturers to follow stringent design, testing, control, documentation, record maintenance, including maintenance of complaint and related investigation files, and other quality assurance controls during the manufacturing process;
- unannounced routine or for-cause device inspections by the FDA, which may include our suppliers' facilities; and
- labeling regulations, which prohibit the promotion of products for uncleared or unapproved or "off-label" uses and impose other restrictions on labeling; post-approval restrictions or conditions, including requirements to conduct post-market surveillance studies to establish continued safety data or tracking products through the chain of distribution to the patient level.

Under the FDA medical device reporting, or MDR, regulations, medical device manufacturers are required to report to the FDA information that a device has or may have caused or contributed to a death or serious injury or has malfunctioned in a way that would likely cause or contribute to death or serious injury if the malfunction of the device or a similar device of such manufacturer were to recur. The decision to file an MDR involves a judgment by the manufacturer. If the FDA disagrees with the manufacturer's determination, the FDA can take enforcement action.

Additionally, the FDA has the authority to require the recall of commercialized products in the event of material deficiencies or defects in design or manufacture. The authority to require a recall must be based on an FDA finding that there is reasonable probability that the device would cause serious adverse health consequences or death. Manufacturers may, under their own initiative, recall a product if any material deficiency in a device is found. The FDA requires that certain classifications of recalls be reported to the FDA within ten working days after the recall is initiated.

The failure to comply with applicable regulatory requirements can result in enforcement action by the FDA, which may include any of the following sanctions:

- untitled letters, warning letters, fines, injunctions or civil penalties;
- recalls, detentions or seizures of products;
- operating restrictions;
- delays in the introduction of products into the market;
- total or partial suspension of production;
- delay or refusal of the FDA or other regulators to grant 510(k) clearance or PMA approvals of new products;
- withdrawals of 510(k) clearance or PMA approvals; or
- in the most serious cases, criminal prosecution.

To ensure compliance with regulatory requirements, medical device manufacturers are subject to market surveillance and periodic, pre-scheduled and unannounced inspections by the FDA, and these inspections may include the manufacturing facilities of subcontractors.

### *Review and Approval of Combination Products in the United States*

Certain products may be comprised of components that would normally be regulated under different types of regulatory authorities, and frequently by different Centers at the FDA. These products are known as combination products. Specifically, under regulations issued by the FDA, a combination product may be:

- a product comprised of two or more regulated components that are physically, chemically, or otherwise combined or mixed and produced as a single entity;
- two or more separate products packaged together in a single package or as a unit and comprised of drug and device products;
- a drug or device packaged separately that according to its investigational plan or proposed labeling is intended for use only with an approved individually specified drug or device 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
- any investigational drug or device 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.

Under the FDCA, the FDA is charged with assigning a center with primary jurisdiction, or a lead center, for review of a combination product. That determination is based on the "primary mode of action" of the combination product. Thus, if the primary mode of action of a device-drug combination product is attributable to the drug product, the FDA Center responsible for premarket review of the drug product would have primary jurisdiction for the combination product. The FDA has also established an Office of Combination Products to address issues surrounding combination products and provide more certainty to the regulatory review process. That office serves as a focal point for combination product issues for agency reviewers and industry. It is also responsible for developing guidance and regulations to clarify the regulation of combination products, and for assignment of the FDA center that has primary jurisdiction for review of combination products where the jurisdiction is unclear or in dispute.

### *Review and Approval of Drug Products in the European Union*

In order to market any product outside of the United States, a company must also comply with numerous and varying regulatory requirements of other countries and jurisdictions regarding quality, safety and efficacy and governing, among other things, clinical trials, marketing authorization, commercial sales and distribution of drug products. Whether or not it obtains FDA approval for a product, the company would need to obtain the necessary approvals by the comparable foreign regulatory authorities before it can commence clinical trials or marketing of the product in those countries or jurisdictions. The approval process ultimately varies between countries and jurisdictions and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries and jurisdictions might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country or jurisdiction does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country or jurisdiction may negatively impact the regulatory process in others.

Pursuant to the European Clinical Trials Directive, a system for the approval of clinical trials in the European Union has been implemented through national legislation of the member states. Under this system, an applicant must obtain approval from the competent national authority of a European Union member state in which the clinical trial is to be conducted. Furthermore, the applicant may only

start a clinical trial after a competent ethics committee has issued a favorable opinion. Clinical trial application must be accompanied by an investigational medicinal product dossier with supporting information prescribed by the European Clinical Trials Directive and corresponding national laws of the member states and further detailed in applicable guidance documents.

To obtain marketing approval of a drug under European Union regulatory systems, an applicant must submit a marketing authorization application, or MAA, either under a centralized or decentralized procedure.

The centralized procedure provides for the grant of a single marketing authorization by the European Commission that is valid for all European Union member states. The centralized procedure is compulsory for specific products, including for medicines produced by certain biotechnological processes, products designated as orphan medicinal products, advanced therapy products and products with a new active substance indicated for the treatment of certain diseases. For products with a new active substance indicated for the treatment of other diseases and products that are highly innovative or for which a centralized process is in the interest of patients, the centralized procedure may be optional.

Under the centralized procedure, the Committee for Medicinal Products for Human Use, or the CHMP, established at the EMA, is responsible for conducting the initial assessment of a drug. The CHMP is also responsible for several post-authorization and maintenance activities, such as the assessment of modifications or extensions to an existing marketing authorization. Under the centralized procedure in the European Union, the maximum timeframe for the evaluation of an MAA is 210 days, excluding clock stops, when additional information or written or oral explanation is to be provided by the applicant in response to questions of the CHMP. Accelerated evaluation might be granted by the CHMP in exceptional cases, when a medicinal product is of major interest from the point of view of public health and in particular from the viewpoint of therapeutic innovation. In this circumstance, the EMA ensures that the opinion of the CHMP is given within 150 days.

The decentralized procedure is available to applicants who wish to market a product in various European Union member states where such product has not received marketing approval in any European Union member states before. 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 designated by the applicant, known as the reference member state. Under this procedure, an applicant submits an application based on identical dossiers 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 report and drafts of the related materials within 210 days after receipt of a valid application. Within 90 days of receiving the reference member state's assessment report and related materials, 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 public health, the disputed points are subject to a dispute resolution mechanism and may eventually be referred to the European Commission, whose decision is binding on all member states.

### ***Review and Approval of Medical Devices in the European Union***

The European Union has adopted numerous directives and standards regulating, among other things, the design, manufacture, clinical trials, labeling, approval and adverse event reporting for medical devices. In the European Union, medical devices must comply with the Essential Requirements in Annex I to the EU Medical Devices Directive (Council Directive 93/42/EEC), or the Essential Requirements. Compliance with these requirements is a prerequisite to be able to affix the CE mark of conformity to medical devices, without which they cannot be marketed or sold in the European Economic Area, or EEA, comprised of the European Union member states plus Norway, Iceland, and

Liechtenstein. Actual implementation of these directives, however, may vary on a country-by-country basis.

To demonstrate compliance with the Essential Requirements a manufacturer must undergo a conformity assessment procedure, which varies according to the type of medical device and its classification. Except for low risk medical devices, where the manufacturer can issue a CE Declaration of Conformity based on a self-assessment of the conformity of its products with the Essential Requirements, a conformity assessment procedure requires the intervention of a third-party organization designated by competent authorities of a European Union country to conduct conformity assessments, or a Notified Body. Notified Bodies are independent testing houses, laboratories, or product certifiers typically based within the European Union and authorized by the European member states to perform the required conformity assessment tasks, such as quality system audits and device compliance testing. The Notified Body would typically audit and examine the product's Technical File and the quality system for the manufacture, design and final inspection of the product before issuing a CE Certificate of Conformity demonstrating compliance with the relevant Essential Requirements.

Medical device manufacturers must carry out a clinical evaluation of their medical devices to demonstrate conformity with the relevant Essential Requirements. This clinical evaluation is part of the product's Technical File. A clinical evaluation includes an assessment of whether a medical device's performance is in accordance with its intended use, and that the known and foreseeable risks linked to the use of the device under normal conditions are minimized and acceptable when weighed against the benefits of its intended purpose. The clinical evaluation conducted by the manufacturer must also address any clinical claims, the adequacy of the device labeling and information (particularly claims, contraindications, precautions and warnings) and the suitability of related Instructions for Use. This assessment must be based on clinical data, which can be obtained from clinical studies conducted on the devices being assessed, scientific literature from similar devices whose equivalence with the assessed device can be demonstrated or both clinical studies and scientific literature.

With respect to implantable devices or devices classified as Class III in the European Union, the manufacturer must conduct clinical studies to obtain the required clinical data, unless relying on existing clinical data from similar devices can be justified. As part of the conformity assessment process, depending on the type of devices, the Notified Body will review the manufacturer's clinical evaluation process, assess the clinical evaluation data of a representative sample of the device's subcategory or generic group, or assess all the clinical evaluation data, verify the manufacturer's assessment of that data and assess the validity of the clinical evaluation report and the conclusions drawn by the manufacturer.

Even after a manufacturer receives a CE Certificate of Conformity enabling the CE mark on its products and the right to sell the products in the EEA countries, a Notified Body or a competent authority may require post-marketing studies of the products. Failure to comply with such requirements in a timely manner could result in the withdrawal of the CE Certificate of Conformity and the recall or withdrawal of the subject product from the European market.

A manufacturer must inform the Notified Body that carried out the conformity assessment of the medical devices of any planned substantial changes to the devices which could affect compliance with the Essential Requirements or the devices' intended purpose. The Notified Body will then assess the changes and verify whether they affect the product's conformity with the Essential Requirements or the conditions for the use of the devices. If the assessment is favorable, the Notified Body will issue a new CE Certificate of Conformity or an addendum to the existing CE Certificate of Conformity attesting compliance with the Essential Requirements. If it is not, the manufacturer may not be able to continue to market and sell the product in the EEA.

In the European Union, medical devices may be promoted only for the intended purpose for which the devices have been CE marked. Failure to comply with this requirement could lead to the

imposition of penalties by the competent authorities of the European Union Member States. The penalties could include warnings, orders to discontinue the promotion of the medical device, seizure of the promotional materials and fines. Promotional materials must also comply with various laws and codes of conduct developed by medical device industry bodies in the European Union governing promotional claims, comparative advertising, advertising of medical devices reimbursed by the national health insurance systems and advertising to the general public.

Additionally, all manufacturers placing medical devices in the market in the European Union are legally bound to report any serious or potentially serious incidents involving devices they produce or sell to the competent authority in whose jurisdiction the incident occurred. In the European Union, manufacturers must comply with the EU Medical Device Vigilance System. Under this system, incidents must be reported to the relevant authorities of the European Union countries, and manufacturers are required to take Field Safety Corrective Actions, or FSCAs, to reduce a risk of death or serious deterioration in the state of health associated with the use of a medical device that is already placed on the market. An incident is defined as any malfunction or deterioration in the characteristics and/or performance of a device, as well as any inadequacy in the labeling or the instructions for use which, directly or indirectly, might lead to or might have led to the death of a patient or user or of other persons or to a serious deterioration in their state of health. An FSCA may include the recall, modification, exchange, destruction or retrofitting of the device. FSCAs must be communicated by the manufacturer or its European Authorized Representative to its customers and to the end users of the device through Field Safety Notices. In September 2012, the European Commission adopted a proposal for a regulation which, if adopted, will change the way that most medical devices are regulated in the European Union, and may subject products to additional requirements.

### **Pharmaceutical Coverage, Pricing and Reimbursement**

Significant uncertainty exists as to the coverage and reimbursement status of products approved by the FDA and other government authorities. Sales of products will depend, in part, on the extent to which the costs of the products will be covered by third-party payors, including government health programs in the United States such as Medicare and Medicaid, commercial health insurers and managed care organizations. The process for determining whether a payor will provide coverage for a product may be separate from the process for setting the price or reimbursement rate that the payor will pay for the product once coverage is approved. Third-party payors may limit coverage to specific products on an approved list, or formulary, which might not include all of the approved products for a particular indication. Additionally, the containment of healthcare costs has become a priority of federal and state governments, and the prices of drugs have been a focus in this effort. The U.S. government, state legislatures and foreign governments have shown significant interest in implementing cost-containment programs, including price controls, restrictions on reimbursement and requirements for substitution of generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit our net revenue and results.

In order to secure coverage and reimbursement for any product that might be approved for sale, a company may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of the product, in addition to the costs required to obtain FDA or other comparable regulatory approvals. A payor's decision to provide coverage for a product does not imply that an adequate reimbursement rate will be approved. Third-party reimbursement may not be sufficient to maintain price levels high enough to realize an appropriate return on investment in product development.

In the European Union, pricing and reimbursement schemes vary widely from country to country. Some countries provide that drug products may be marketed only after a reimbursement price has been agreed. Some countries may require the completion of additional studies that compare the



cost-effectiveness of a particular product candidate to currently available therapies. For example, the European Union provides options for its member states to restrict the range of drug products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. European Union member states may approve a specific price for a drug product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the drug product on the market. Other member states allow companies to fix their own prices for drug products, but monitor and control company profits. The downward pressure on health care costs in general, particularly prescription drugs, has become intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross-border imports from low-priced markets exert competitive pressure that may reduce pricing within a country. Any country that has price controls or reimbursement limitations for drug products may not allow favorable reimbursement and pricing arrangements.

### ***Healthcare Law and Regulation***

Healthcare providers, physicians and third-party payors play a primary role in the recommendation and prescription of drug products that are granted marketing approval. Arrangements with third-party payors and customers are subject to broadly applicable fraud and abuse and other healthcare laws and regulations. Such restrictions under applicable federal and state healthcare laws and regulations, include the following:

- the federal Anti-Kickback Statute prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made, in whole or in part, under a federal healthcare program such as Medicare and Medicaid;
- the federal False Claims Act imposes civil penalties, and provides for civil whistleblower or qui tam actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act and its implementing regulations, also imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;
- the federal false statements statute prohibits knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement in connection with the delivery of or payment for healthcare benefits, items or services;
- the federal transparency requirements under the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively the PPACA will require applicable manufacturers of covered drugs, devices, biologics and medical supplies to report to the Department of Health and Human Services information related to payments and other transfers of value to physicians and teaching hospitals and physician ownership and investment interests; and
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers.

Some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug manufacturers to report information related to payments to physicians and other health care providers or marketing expenditures. State and foreign laws also govern the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

## **Employees**

As of September 30, 2014, we had 47 full-time employees, of which 41 employees were engaged in research and development and six employees provided general and administrative support. Of our employees, 27 have earned advanced degrees. Our employees are not represented by a labor union or covered by a collective bargaining agreement.

## **Facilities**

Our principal facilities consist of approximately 25,000 square feet of office space at Ikaria's headquarters located in Hampton, New Jersey and approximately 3,200 square feet of office space and research lab facilities at the Commercialization Center for Innovative Technologies located in North Brunswick, New Jersey. We have access to the office space at Ikaria's headquarters until February 2016, pursuant to the TSA. We lease the space in North Brunswick, New Jersey under a lease that expires in March 2015.

## **Legal Proceedings**

We are not presently a party to any material litigation or regulatory proceeding and, except as set forth below, we are not aware of any pending or threatened litigation or regulatory proceeding against us that could have a material adverse effect on our business, operating results, financial condition or cash flows.

We have recently been engaged in discussions with BioLine relating to our performance under our license agreement. BioLine has indicated to us that it believes that we have breached the license agreement in several ways, including, but not limited to, failure to use commercially reasonable efforts to develop BCM, failure to provide BioLine with material information concerning the development and commercialization plans for BCM and failure to notify BioLine in advance of material public disclosures regarding BCM. We and BioLine also disagree about the timing of a \$12.5 million milestone payment that we would owe BioLine based upon progress in our BCM clinical development program. Although we have had multiple discussions with BioLine on these issues, and these discussions are continuing, we have not been able to resolve these outstanding issues. If we are unable to reach agreement with BioLine on these issues, BioLine could bring a lawsuit against us, although any claims relating to our alleged failure to use commercially reasonable efforts would first be subject to a non-binding 60-day mediation period with a third-party mediator. We believe that we would have strong defenses in any litigation that could be brought by BioLine. If BioLine were to prevail in any such litigation, one of the potential remedies would be the return of BCM to BioLine. In addition, if BioLine were to prevail in any such litigation, or if we were required to pay the milestone in dispute sooner than we had planned, or if we were required to return BCM to BioLine, these events could have a material adverse effect on our business, results of operations, financial condition and/or liquidity.

## MANAGEMENT

The following table sets forth the name, age and position of each of our executive officers and directors as of September 30, 2014.

<u>Name</u>	<u>Age</u>	<u>Position</u>
Jonathan M. Peacock	56	Chief Executive Officer, President and Chairman
Manesh Naidu	44	Vice President and Chief Business Officer
Reinilde Heyrman, M.D.	54	Vice President, Chief Clinical Development Officer and Secretary
Martin Meglasson, Ph.D.	64	Vice President and Chief Scientific Officer
David Abrams	40	Treasurer
Aldo E. Belloni, Ph.D.	64	Director
Matthew Holt	37	Director
Andre V. Moura	33	Director
Robert T. Nelsen	51	Director
Howard Pien	56	Director
Daniel Tassé	54	Director
Adam B. Weinstein	35	Director

- (1) Member of the Audit Committee
- (2) Member of the Compensation Committee
- (3) Member of the Nominating and Corporate Governance Committee

*Jonathan M. Peacock* has served as our Chief Executive and President and as the Chairman of our board of directors since June 2014. Prior to joining us, Mr. Peacock served as the Chief Financial Officer of Amgen Inc., a biotechnology company, from September 2010 to January 2014. From November 2005 to September 2010, he served as Chief Financial and Administrative Officer of Novartis Pharmaceuticals AG, the Pharmaceuticals and Biotechnology division of Novartis AG. Mr. Peacock was a partner at McKinsey and Company, a global strategy consulting firm, from 1998 to 2005. Before that, he was a partner at Price Waterhouse LLP, a global accounting firm (now PricewaterhouseCoopers LLP), from 1993 to 1998. He currently serves on the board of directors of Kite Pharma, Inc., a biopharmaceutical company. Mr. Peacock received an M.A. degree in economics from the University of St. Andrews. We believe that Mr. Peacock is qualified to serve on our board of directors because of his global management experience, his experience as an officer of a public company in our industry, his financial expertise and his position as our Chief Executive Officer and President.

*Manesh Naidu* has served as our Vice President and Chief Business Officer since February 2014. Mr. Naidu previously served as Vice President and General Manager of the INOpulse program of Ikaria, a biotherapeutics company, from August 2011 to February 2014, and prior to that, he served as Senior Director, Marketing Strategy of Ikaria from May 2008 to August 2011. Prior to joining Ikaria, Mr. Naidu held several positions at Novartis Corporation and Pfizer Inc., both of which are pharmaceutical companies, from 2003 to 2008. He also worked at McKinsey & Company, a global strategy consulting firm, from 2001 to 2003. Mr. Naidu received an M.S. in chemical engineering from Oklahoma State University, a B.E. in chemical engineering and an M.S. in chemistry both from the Birla Institute of Technology and Science, and an M.B.A. from the Kellogg School of Management at Northwestern University.

*Reinilde Heyrman, M.D.* has served as our Vice President, Chief Clinical Development Officer and Secretary since February 2014. Prior to joining us, Dr. Heyrman served as Vice President, Chief Clinical Development Officer of Ikaria from March 2012 to February 2014. Dr. Heyrman held several positions

at Daiichi Sankyo Pharma Development, a pharmaceutical company, from 2005 to March 2012, most recently as Vice President, Clinical Development from 2009 to March 2012. From 2001 to 2002 and 2002 to 2005, Dr. Heyrman served as Director Clinical Research and Senior Director Clinical Research, respectively, at Sankyo Pharma Development, a pharmaceutical company. Dr. Heyrman received an M.D. from the University of Antwerp, Belgium.

*Martin Meglasson, Ph.D.* has served as our Vice President and Chief Scientific Officer since February 2014. From July 2010 to February 2014, Dr. Meglasson served as Chief Scientific Officer of Ikaria. Prior to joining Ikaria, Dr. Meglasson served as Vice President, head of Research and Development of Ligand Pharmaceuticals Incorporated, a biotechnology company, from February 2004 to July 2010. From 1996 to 2003, Dr. Meglasson was Director of Preclinical Pharmacology at Pharmacia, Inc., a pharmaceutical company, and from 1984 to 1992, he was first an Assistant Professor and later an Associate Professor of Pharmacology at the University of Pennsylvania School of Medicine. Dr. Meglasson received a B.S. in biology, an M.S. in physiology and a Ph.D. in pharmacology, each from the University of Houston.

*David Abrams* has been our Treasurer since February 2014, with responsibilities for treasury, financial planning and financial reporting. Prior to joining us, Mr. Abrams held various roles in strategic financial planning at Ikaria from October 2010 to February 2014 and at Johnson & Johnson, a healthcare products company, from May 2002 to October 2010. Mr. Abrams has previously held roles at Stern Stewart and Deutsche Bank. Mr. Abrams received a B.S. in economics from The Wharton School of Business of the University of Pennsylvania and a B.A. in history from the University of Pennsylvania.

*Aldo E. Belloni, Ph.D.* has served as a member of our board of directors since February 2014. Since 1980, Dr. Belloni has held several positions with Linde AG, a world leading supplier of industrial, process and specialty gases and engineering company, and its subsidiaries, and has served as a Member of the Executive Board of Linde AG since January 2000. Dr. Belloni received a Ph.D. in chemical engineering from the Milan Polytechnic Institute. We believe that Dr. Belloni is qualified to serve on our board of directors because of his extensive strategic and executive level experience, including as a member of the Executive Board of Linde AG.

*Matthew Holt* has served as a member of our board of directors since February 2014. Since 2001, Mr. Holt has been employed by New Mountain Capital, a private equity group, where he currently serves as a Managing Director. Prior to joining New Mountain Capital, Mr. Holt served in the mergers and acquisitions Group at Lehman Brothers, a financial services firm. Mr. Holt has served on the board of directors of Ikaria since March 2007. Mr. Holt received an A.B. in English and American literature and language from Harvard College. We believe that Mr. Holt is qualified to serve on our board of directors because of his financial expertise and his years of experience providing strategic advisory services across many industries.

*Andre V. Moura* has served as a member of our board of directors since February 2014. Mr. Moura joined New Mountain Capital in 2005, where he currently serves as a Director. Prior to joining New Mountain Capital, Mr. Moura was employed by McKinsey & Company, a global management consulting firm. Mr. Moura also serves on the board of directors of two privately held companies. Mr. Moura received an A.B. in computer science from Harvard College and an M.B.A. from Harvard Business School. We believe that Mr. Moura is qualified to serve on our board of directors because of his financial expertise and his years of experience providing strategic advisory services to diverse companies across multiple industries.

*Robert T. Nelsen* has served as a member of our board of directors since February 2014. Since 1986, Mr. Nelsen has served as a Co-Founder and Managing Director of ARCH Venture Partners, a venture capital firm focused on early-stage technology companies. Mr. Nelsen currently serves as a director of Agios Pharmaceuticals, Inc., Fate Therapeutics, Inc. and Kythera Biopharmaceuticals, Inc., each a

publicly traded biopharmaceutical company. Mr. Nelsen previously served as a director of Adolor Corporation, Array BioPharma Inc., Illumina, Inc., NeurogesX, Inc., Receptos, Inc. and Trubion Pharmaceuticals, Inc., each a biopharmaceutical company. Mr. Nelsen also serves on the board of several privately held companies, including Sage Therapeutics and Sapphire Energy Corporation. Mr. Nelsen received a B.S. from the University of Puget Sound, with majors in biology and economics, and an M.B.A. from the University of Chicago Graduate School of Business. We believe that Mr. Nelsen is qualified to serve on our board of directors because of his extensive experience with biotechnology companies, his financial expertise and his years of experience providing strategic and financial advisory services to pharmaceutical and biotechnology organizations, including evaluating business plans involving clinical trials.

*Howard Pien* has served as a member of our board of directors since February 2014. From May 2007 to September 2009, Mr. Pien served as the Chief Executive Officer of Medarex, Inc., a biotechnology company, or Medarex, until Medarex was acquired by Bristol-Myers Squibb. Since that time, Mr. Pien has served on a number of boards of directors, including the following companies of which he is currently a member: Vanda Pharmaceuticals Inc., a publicly traded drug development company; ImmunoGen, Inc., a publicly traded company engaged in anticancer therapeutic development; Juno Therapeutics, a development stage company focused on immunotherapy, and Sage Therapeutics, a publicly traded company focused on the central nervous system. He is also an advisor to Warburg Pincus, a private equity firm. Prior to joining Medarex, Mr. Pien served as the President and Chief Executive Officer and as a director of Chiron Corporation, a biopharmaceutical company, from April 2003 until Chiron Corporation's merger with Novartis AG in May 2006. Mr. Pien was chairman of the board of directors of each of Chiron Corporation and Medarex. From December 2000 to March 2003, Mr. Pien worked at GlaxoSmithKline, a healthcare company, where he held several positions in GlaxoSmithKline's worldwide pharmaceuticals business, including President, Pharmaceuticals International. Mr. Pien previously held key positions in SmithKline Beecham's pharmaceuticals business in the United States, the United Kingdom and North Asia, culminating in his tenure as President, Pharmaceuticals-North America. Prior to joining SmithKline Beecham, he worked for six years at Abbott Laboratories and for five years at Merck & Co. Mr. Pien previously served on the boards of directors of ViroPharma Incorporated, a pharmaceutical development company, Talon Therapeutics, Inc., a biopharmaceutical company, and Medarex. Mr. Pien received a B.S. from the Massachusetts Institute of Technology and an M.B.A. from Carnegie-Mellon University. We believe that Mr. Pien is qualified to serve on our board of directors because of his extensive experience in the biotechnology industry, including his management expertise as a chief executive officer of pharmaceutical and biotechnology companies and his extensive corporate governance expertise as a director of private and public companies.

*Daniel Tassé* has served as a member of our board of directors since February 2014 and served as our Chairman from February 2014 to June 2014. Since January 2008, Mr. Tassé has served as President and Chief Executive Officer and as a member of the board of directors of Ikaria. Mr. Tassé was appointed chairman of Ikaria's board of directors in October 2009. Mr. Tassé served as our Interim Chief Executive Officer and President from February 2014 to June 2014. From October 2004 to January 2008, Mr. Tassé served as General Manager of the Pharmaceuticals and Technologies Business Unit of Baxter International, Inc., a global diversified healthcare company. From July 2001 to October 2004, Mr. Tassé served as Vice President and Regional Director for Australasia at GlaxoSmithKline, a healthcare company. Mr. Tassé is a member of the Healthcare Leadership Council and a member of the board of directors of the Roundtable on Critical Care Policy. He also is a member of the board of directors and health section governing board of the Biotechnology Industry Organization, where he participates on the bioethics, regulatory environment and reimbursement committees. Additionally, Mr. Tassé is a member of the board of directors of the Pharmaceutical Research and Manufacturers Association of America, where he participates on the FDA and biomedical research committee. Mr. Tassé received a B.S. in biochemistry from the University of Montreal. We believe Mr. Tassé is

qualified to serve on our board of directors because of his former service as our Chief Executive Officer and President, his extensive track record of business building in the healthcare industry, his strong background within critical care, his global management experience and his detailed knowledge of the pharmaceutical industry, our company, employees, client base and competitors.

*Adam B. Weinstein* has served as a member of our board of directors since February 2014. He is a Managing Director of New Mountain Capital, LLC, and he joined that organization in 2005. At New Mountain, Mr. Weinstein serves as a Chief Financial Officer and is an Executive Vice President and is on the Board of Directors of New Mountain Finance Corporation, a publicly traded business development company. Prior to joining New Mountain, Mr. Weinstein held roles in the mergers and acquisitions and private equity investor services areas of Deloitte & Touche, LLP, in that firm's merger and acquisition and private equity investor services areas. Mr. Weinstein is a New York State Certified Public Accountant and received his B.S., summa cum laude, in accounting from Binghamton University. We believe that Mr. Weinstein is qualified to serve on our board of directors because of his financial and accounting expertise and valuable corporate governance experience.

## **Board Composition and Election of Directors**

Our business and affairs are currently managed by our limited liability company board of directors, which consists of eight members. Five of the members of our board of directors were designated by certain of our principal stockholders and elected pursuant to a voting agreement that we entered into with our principal stockholders. The voting agreement will terminate upon the closing of this offering.

Following the completion of this offering, pursuant to a stockholders agreement that we expect to enter into, the New Mountain Entities will be entitled to nominate one director to our board of directors and to the board of directors (or equivalent governing body) of each of our subsidiaries and to appoint the lead non-employee director of our board of directors, in each case, for so long as the New Mountain Entities and their respective assignees beneficially own (i) 50% or more of the sum of (a) the aggregate number of shares of our common stock that they collectively own immediately prior to the closing of this offering and (b) the number of shares of our common stock, if any, acquired following the closing of this offering (subject in each case to adjustment in the event of any stock split, reverse stock split, stock dividend, recapitalization, combination or shares, reclassification or other similar change in our capitalization) and (ii) at least 15% of our common stock outstanding (as set forth on the cover of our then most recently filed annual report on Form 10-K or quarterly report on Form 10-Q).

Following the closing of this offering, in accordance with the terms of our certificate of incorporation and bylaws that will become effective as of the closing of this offering, our board of directors will be divided into three classes—class I, class II and class III—with members of each class serving staggered three-year terms. Upon the closing of this offering, the members of the classes will be divided as follows:

- the class I directors are \_\_\_\_\_, and their term expires at our annual meeting of stockholders to be held in 2015;
- the class II directors are \_\_\_\_\_, and their term expires at our annual meeting of stockholders to be held in 2016; and
- the class III directors are \_\_\_\_\_, and their term expires at our annual meeting of stockholders to be held in 2017.

Upon the expiration of the term of a class of directors, directors in that class are eligible to be elected for a new three-year term at the annual meeting of stockholders in the year in which their term expires. In accordance with the terms of our certificate of incorporation and bylaws that will become effective upon the closing of this offering, the authorized number of our directors may be changed only

by resolution of our board of directors, our directors may be removed only for cause and by the affirmative vote of holders of at least 75% of the outstanding shares of our common stock and any vacancy on our board of directors, including a vacancy resulting from an enlargement of our board of directors, may be filled only by vote of a majority of our directors then in office.

The rules established by the NASDAQ Stock Market, or NASDAQ rules, require that a majority of our board of directors be independent within one year of listing. Under NASDAQ rules, a director will only qualify as an "independent director" if, in the opinion of our board of directors, that person does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. Our board of directors has determined that, at the time of this offering, Dr. Belloni and Messrs. Nelsen and Pien will be independent directors, as defined by the applicable NASDAQ and Securities and Exchange Commission, or SEC, rules. In making such determination, our board of directors considered the relationships that each such non-employee director has with our company and all other facts and circumstances that our board of directors deemed relevant in determining their independence, including the beneficial ownership of our capital stock by each non-employee director. We intend to appoint three additional independent directors to our board, such that a majority of our board will be independent, within one year following the completion of this offering in accordance with the phase-in period under NASDAQ rules.

There are no family relationships among any of our directors or executive officers.

#### **Lead Non-Employee Director**

Our board of directors has appointed Mr. Holt to serve as our lead non-employee director. As lead non-employee director, Mr. Holt presides over periodic meetings of our non-employee directors, serves as a liaison between our Chairman and the other directors and performs such additional duties as our board of directors may otherwise delegate.

#### **Board Committees**

Our board of directors has established an audit committee, a compensation committee and a nominating and corporate governance committee, each of which operates under a charter that has been approved by our board of directors. Current copies of each committee's charter will be posted on the [www.bellerophon.com](http://www.bellerophon.com) section of our website, [www.bellerophon.com](http://www.bellerophon.com). The composition of each committee will be effective upon the closing of this offering.

Following the completion of this offering, pursuant to a stockholders agreement that we expect to enter into, the director nominated by the New Mountain Entities will be entitled to serve on each committee of our board of directors and the consent of the New Mountain Entities will be required to establish any new committee of our board of directors, in each case except to the extent prohibited by applicable law or applicable listing exchange rules, for so long as the New Mountain Entities and their respective assignees beneficially own (i) 50% or more of the sum of (a) the aggregate number of shares of our common stock that they collectively own immediately prior to the closing of this offering and (b) the number of shares of our common stock, if any, acquired following the closing of this offering (subject in each case to adjustment in the event of any stock split, reverse stock split, stock dividend, recapitalization, combination or shares, reclassification or other similar change in our capitalization) and (ii) at least 15% of our common stock outstanding (as set forth on the cover of our then most recently filed annual report on Form 10-K or quarterly report on Form 10-Q).

## **Audit Committee**

The members of our audit committee are . chairs our audit committee. Our audit committee's responsibilities will include:

- appointing, approving the compensation of, and assessing the independence of our registered public accounting firm;
- overseeing the work of our independent registered public accounting firm, including through the receipt and consideration of reports from such firm;
- reviewing and discussing with management and our independent registered public accounting firm our annual and quarterly financial statements and related disclosures;
- monitoring our internal control over financial reporting, disclosure controls and procedures and code of business conduct and ethics;
- overseeing our internal audit function;
- overseeing our risk assessment and risk management policies;
- establishing policies regarding hiring employees from our independent registered public accounting firm and procedures for the receipt and retention of accounting related complaints and concerns;
- meeting independently with our internal auditing staff, our independent registered public accounting firm and management;
- reviewing and approving or ratifying any related person transactions; and
- preparing the audit committee report required by SEC rules.

All audit and non-audit services, other than *de minimis* non-audit services, to be provided to us by our independent registered public accounting firm must be approved in advance by our audit committee.

Our board of directors has determined that is an "audit committee financial expert" as defined in applicable SEC rules.

## **Compensation Committee**

The members of our compensation committee are . chairs our compensation committee. Our compensation committee's responsibilities will include:

- reviewing and approving, or making recommendations to our board with respect to, the compensation of our chief executive officer and our other executive officers;
- overseeing an evaluation of our senior executives;
- overseeing and administering our cash and equity incentive plans;
- reviewing and making recommendations to our board with respect to director compensation;
- reviewing and discussing annually with management our compensation disclosure required by SEC rules; and
- preparing the compensation committee report required by SEC rules.



- identifying individuals qualified to become members of our board;
- recommending to our board the persons to be nominated for election as directors and to each of our board's committees;
- reviewing and making recommendations to our board with respect to our board leadership structure;
- reviewing and making recommendations to our board with respect to management succession planning;
- developing and recommending to our board corporate governance principles; and
- overseeing a periodic evaluation of our board.

### Compensation Committee Interlocks and Insider Participation

None of our executive officers serves as a member of the board of directors or compensation committee, or other committee serving an equivalent function, of any other entity that has one or more of its executive officers serving as a member of our board of directors or our compensation committee. None of the members of our compensation committee is, or has ever been, an officer or employee of our company.

## Code of Ethics and Code of Conduct

We have adopted a written code of business conduct and ethics that applies to our directors, officers and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. We have posted a current copy of the code on our website, [www.bellerophon.com](http://www.bellerophon.com). If we make any substantive amendments to, or grant any waivers from, the code of business conduct and ethics for any officer or director, we will disclose the nature of such amendment or waiver on our website or in a Current Report on Form 8-K.

## EXECUTIVE COMPENSATION

### Overview

We were formed on October 17, 2013 as a subsidiary of Ikaria and we became an independent, stand-alone operating company as a result of the Spin-Out on February 12, 2014. Because the costs and liabilities with respect to compensation of our employees for the fiscal year ended December 31, 2013 and for prior periods were paid by Ikaria on the basis of criteria and methodology not relevant to us and work performed with respect to businesses in addition to ours, we are not presenting compensation information for historical periods.

In preparing to become a stand-alone public company, we have begun a thorough review of all elements of our executive compensation program, including the function and design of our equity incentive programs. We have begun, and expect to continue in the coming months, to evaluate the need for revisions to our executive compensation program to ensure that our program is competitive with the companies with which we compete for executive talent and is appropriate for a public company. As we gain experience as a stand-alone, public company, we expect that the specific direction, emphasis and components of our executive compensation program will continue to evolve. Moving forward, our compensation committee will review and approve the compensation of our executive officers and oversee and administer our executive compensation programs and initiatives.

### Compensation Components

This section describes the material elements of compensation of each of our executive officers: Jonathan Peacock, President and Chief Executive Officer; Manesh Naidu, Vice President and Chief Business Officer; Reinilde Heyrman, Vice President, Chief Clinical Development Officer and Secretary; Martin Meglasson, Vice President and Chief Scientific Officer; and David Abrams, Treasurer. On the basis of the anticipated compensation of our executive officers for 2014, described in more detail below, we expect that our "named executive officers" will be Mr. Peacock, Dr. Heyrman and Dr. Meglasson, in addition to our former interim Chief Executive Officer, Daniel Tassé.

**Base Salary.** We will pay our executive officers the following annualized base salaries for the year ending December 31, 2014: \$400,000 to Mr. Peacock, \$244,600 to Mr. Naidu, \$433,500 to Dr. Heyrman, \$363,000 to Dr. Meglasson and \$179,500 to Mr. Abrams. We did not pay Mr. Tassé a base salary for the year ending December 31, 2014. Base salaries are used to recognize the experience, skills, knowledge and responsibilities required of all of our employees, including our executive officers. In determining the base salaries of our executive officers, we did not engage in any form of benchmarking in the determination of base salaries of our executive officers. Following the closing of this offering, our compensation committee will review the salaries of our executives annually at the beginning of each calendar year and recommend to our board of directors changes in salaries based primarily on changes in job responsibilities, experience, individual performance and comparative market data.

**Bonus Compensation.** Our executive officers are expected to be eligible to receive an annual cash bonus award in accordance with the management incentive program then in effect with respect to such executive officer and based on an annualized target of base salary. Our executive officers are also expected to be eligible for performance-based annual bonus awards based on metrics to be determined by our board of directors, in consultation with the executive officer, and our board of directors will determine the extent to which the metrics have been satisfied and the amount of the annual bonus, if any. The performance-based bonuses are designed to motivate our employees to achieve annual goals based on our strategic, financial and operating performance objectives.

**Long-Term Equity Based Incentive Awards.** We believe that equity grants provide our executives with a strong link to our long-term performance, create an ownership culture and help to align the interests of our executives and our stockholders. In addition, we believe that equity grants with a time-based vesting feature promote executive retention because this feature incentivizes our executive officers to remain in our employment during the vesting period. Accordingly, our compensation

committee and board of directors periodically review the equity incentive compensation of our named executive officers and from time to time may grant additional equity incentive awards to them in the form of stock options.

In June 2014, our board of directors granted an option to purchase 5,641,718 shares of our common stock to Mr. Peacock, an option to purchase 100,000 shares of our common stock to Mr. Naidu, an option to purchase 100,000 shares of our common stock to Dr. Heyrman, an option to purchase 100,000 shares of our common stock to Dr. Meglasson and an option to purchase 50,000 shares of our common stock to Mr. Abrams. These options have an exercise price of \$1.06 per share. The option granted to Mr. Peacock vests in five equal annual 20% installments with the first installment vesting on the date of grant and the remaining installments vesting on each anniversary of the date of grant, subject to acceleration in the event of a change of control (as defined in Mr. Peacock's employment agreement). The options granted to Mr. Naidu, Dr. Heyrman, Dr. Meglasson and Mr. Abrams vest as to 25% of the shares underlying the option on each of the second and third anniversaries of the Spin-Out and as to 50% of the shares underlying the option on the fourth anniversary of the Spin-Out.

## **Employment Agreements with Our Executive Officers**

### ***Agreement with Mr. Peacock***

In June 2014, we entered into an employment agreement with Mr. Peacock in connection with the commencement of his employment with us. The agreement provides that Mr. Peacock is employed at will, and either we or Mr. Peacock may terminate the employment relationship for any reason, at any time. Mr. Peacock is required to give us at least 30 days' prior notice if he elects to terminate his employment other than for good reason (as defined in the employment agreement). Following the end of each calendar year, Mr. Peacock is eligible to receive an annual bonus based on the achievement of individual and company performance objectives, which will be determined by our board of directors in its sole discretion. His bonus will be calculated as a percentage of his annual base salary. As of the date of this prospectus, Mr. Peacock's target bonus percentage is 100%.

Pursuant to the terms of his employment agreement, we granted an option to purchase 5,641,718 shares of our non-voting common stock to Mr. Peacock. The option has a per share exercise price equal to the fair market value of a share of our common stock on the date of grant. The shares underlying such option will vest in five equal annual 20% installments with the first installment vesting on the date of grant and the remaining installments vesting on each anniversary of the date of grant. In the event of a change in control (as defined in the employment agreement), the vesting of the option will accelerate in full.

If we terminate Mr. Peacock's employment without cause (as defined in the employment agreement) or if Mr. Peacock terminates his employment with us for good reason (as defined in the employment agreement), Mr. Peacock is entitled to receive: a lump sum payment in an amount equal to earned but unpaid base salary and annual bonus, any accrued but unpaid vacation time and any incurred but unreimbursed expenses; a pro-rated portion of his annual bonus target for the year in which his employment terminates; payments for a period of 18 months immediately following the date of termination in an aggregate amount equal to one and one half times the sum of (i) Mr. Peacock's annual base salary and (ii) the greater of his applicable annual bonus target and the actual annual bonus most recently paid to Mr. Peacock, determined on a monthly basis; and continued coverage, at our expense, under our medical, dental and vision benefit plans for 18 months immediately following the date of termination.

We have agreed to indemnify and hold Mr. Peacock harmless from and against any liabilities Mr. Peacock may incur under Section 409A of the Internal Revenue Code of 1986, as amended, on account of any payments made to Mr. Peacock pursuant to his employment agreement.

Mr. Peacock is subject to confidentiality, invention assignment, non-disclosure, non-competition and non-solicitation obligations pursuant to the terms of his employment agreement.

#### ***Agreements with Other Executive Officers***

We also have written employment agreements with Mr. Naidu, Dr. Heyrman and Dr. Meglasson. Each agreement provides for an employment term of one year, with the term automatically renewing for successive one-year terms, unless we or the applicable officer gives written notice of non-renewal at least 90 days prior to the renewal date. Each of these officers is subject to confidentiality, invention assignment, non-disclosure, non-competition and non-solicitation agreements.

In addition, following the end of each calendar year, each executive officer named below is eligible to receive an annual bonus based on the achievement of individual and company performance objectives, which will be determined by our board of directors in its sole discretion. The bonus is calculated as a percentage of the executive's annual base salary. As of the date of this prospectus, the target bonus percentage for each such executive officer is as follows: Mr. Naidu 35%, Dr. Heyrman 40% and Dr. Meglasson 40%.

We do not have an employment agreement with Mr. Abrams. As of the date of this prospectus, Mr. Abrams' target bonus is 25%.

Each of Mr. Naidu, Dr. Heyrman and Dr. Meglasson are entitled to severance payments if his or her employment is terminated under specified circumstances.

*Manesh Naidu.* If we terminate Mr. Naidu's employment without cause (as defined in the employment agreement), if Mr. Naidu terminates his employment with us for good reason (as defined in the employment agreement) or if Mr. Naidu terminates his employment at the end of a term following delivery by us of notice that we will not extend the term, Mr. Naidu is entitled to receive: a lump sum payment in an amount equal to earned but unpaid base salary and annual bonus and any accrued but unpaid vacation time; payments for a period of 12 months immediately following the date of termination in an aggregate amount equal to the sum of (i) Mr. Naidu's annual base salary and (ii) the greater of his applicable annual bonus target and the actual annual bonus most recently paid to Mr. Naidu, determined on a monthly basis; and continued coverage, at our expense, under our medical, dental and vision benefit plans for 12 months immediately following the date of termination.

In the event that we terminate Mr. Naidu's employment without cause, Mr. Naidu terminates his employment with us for good reason or Mr. Naidu terminates his employment at the end of a term following delivery by us of notice that we will not extend the term, in each case within 12 months of the occurrence of a change of control, any equity compensation granted to Mr. Naidu shall become fully vested as of the date of termination.

*Dr. Reinilde Heyrman.* If we terminate Dr. Heyrman's employment without cause (as defined in the employment agreement), if Dr. Heyrman terminates her employment with us for good reason (as defined in the employment agreement) or if Dr. Heyrman terminates her employment at the end of a term following delivery by us of notice that we will not extend the term, Dr. Heyrman is entitled to receive: a lump sum payment in an amount equal to earned but unpaid base salary and annual bonus and any accrued but unpaid vacation time; payments for a period of 12 months immediately following the date of termination in an aggregate amount equal to the sum of (i) Dr. Heyrman's annual base salary and (ii) the greater of her applicable annual bonus target and the actual annual bonus most recently paid to Dr. Heyrman, determined on a monthly basis; and continued coverage, at our expense, under our medical, dental and vision benefit plans for 12 months immediately following the date of termination.

In the event that we terminate Dr. Heyrman's employment without cause, Dr. Heyrman terminates her employment with us for good reason, or Dr. Heyrman terminates her employment at the end of a term following delivery by us of notice that we will not extend the term, in each case within 12 months

of the occurrence of a change of control, any equity compensation granted to Dr. Heyrman shall become fully vested as of the date of termination.

*Dr. Martin Meglasson.* If we terminate Dr. Meglasson's employment without cause (as defined in the employment agreement), if Dr. Meglasson terminates his employment with us for good reason (as defined in the employment agreement) or if Dr. Meglasson terminates his employment at the end of a term following delivery by us of notice that we will not extend the term, Dr. Meglasson is entitled to receive: a lump sum payment in an amount equal to earned but unpaid base salary and annual bonus and any accrued but unpaid vacation time; a pro-rated portion of his annual bonus target for the year in which his employment terminates; payments for a period of 12 months immediately following the date of termination in an aggregate amount equal to the sum of (i) Dr. Meglasson's annual base salary and (ii) the greater of his applicable annual bonus target and the actual annual bonus most recently paid to Dr. Meglasson, determined on a monthly basis; and continued coverage, at our expense, under our medical, dental and vision benefit plans for 12 months immediately following the date of termination.

In the event that we terminate Dr. Meglasson's employment without cause, Dr. Meglasson terminates his employment with us for good reason or Dr. Meglasson terminates his employment at the end of a term following delivery by us of notice that we will not extend the term, in each case within 18 months of the occurrence of a change of control, Dr. Meglasson is entitled to receive: a lump sum payment in an amount equal to 50% of the sum of (i) Dr. Meglasson's annual base salary and (ii) the greater of his target annual bonus and the actual annual bonus paid to Dr. Meglasson; an additional six months of continued coverage, at our expense, under our medical, dental and vision benefit plans; and the unvested portion of any equity compensation granted to Dr. Meglasson shall become immediately fully vested.

#### **Retention Bonus Agreements with Our Executive Officers**

On February 3, 2014, we delivered letters to each of Mr. Naidu, Dr. Heyrman, Dr. Meglasson and Mr. Abrams offering them a one-time "retention bonus" payment if Mr. Naidu, Dr. Heyrman, Dr. Meglasson or Mr. Abrams, respectively, remains an active employee of Bellerophon in good standing through December 19, 2014. The bonus would be payable within 30 days after December 19, 2014. The retention bonus payments payable are in the following amounts, less applicable taxes: \$150,000 to Mr. Naidu, \$150,000 to Dr. Heyrman, \$150,000 to Dr. Meglasson and \$75,000 to Mr. Abrams.

#### **Equity Ownership of Our Executive Officers**

In connection with the Spin-Out, Ikaria distributed our then outstanding units to its stockholders through the payment of a special dividend on a pro rata basis based on each stockholder's ownership of Ikaria capital stock. Prior to the Spin-Out, we issued to certain employees and directors of ours and of Ikaria, including certain of our executive officers, and certain accredited investors options to purchase the same number of our non-voting membership units as the number of shares of non-voting Ikaria stock subject to the Ikaria options then held by such employee, director or accredited investor at such time. The vesting of these options was subsequently accelerated and all are now fully vested. Prior to the Spin-Out, we issued to certain employees and directors of ours or of Ikaria, including certain of our executive officers, and certain accredited investors the same number of restricted stock units in respect of our non-voting membership units, which we refer to as the Bellerophon RSUs, as the number of shares of non-voting Ikaria stock held by such employee, director or accredited investor at such time. We subsequently settled such Bellerophon RSUs by issuing and delivering non-voting units to the holders of Bellerophon RSUs.

The below table summarizes the outstanding equity ownership of our executive officers as of September 30, 2014, after giving effect to the Corporate Conversion and the conversion of non-voting shares into voting shares upon the closing of this offering.

<u>Name</u>	<u>Shares Owned</u>	<u>Shares Subject to Vested Options</u>	<u>Shares Subject to Unvested Options</u>
Jonathan M. Peacock	—	1,128,343	4,513,375
Manesh Naidu	123,000	78,000	100,000
Reinilde Heyrman	100,000	—	100,000
Martin Meglasson	80,000	100,000	100,000
David Abrams	—	20,000	50,000
All executive officers as a group	303,000	1,326,343	4,863,375

### Stock Option and Other Compensation Plans

The four equity incentive plans described in this section are (i) the assumed 2007 Ikaria stock option plan, which we refer to as the 2007 Ikaria plan, (ii) the assumed Ikaria 2010 long term incentive plan, which we refer to as the 2010 Ikaria plan, (iii) our 2014 equity incentive plan, which we refer to as the 2014 equity plan and (iv) our public company stock incentive plan, which we refer to as the public company incentive plan. Following the closing of this offering, we expect to grant awards to eligible participants only under the public company incentive plan.

#### *Assumed 2007 Ikaria Plan*

The 2007 Ikaria plan was adopted by Ikaria in March 2007, and we assumed the terms of the 2007 Ikaria plan in connection with the Spin-Out. Stock options granted under the 2007 Ikaria plan have a contractual life of ten years. Pursuant to the terms of the 2007 Ikaria plan, in the event of a liquidation or dissolution of our company, each outstanding option under the 2007 Ikaria plan will terminate immediately prior to the consummation of the action, unless the administrator determines otherwise. In the event of a merger or other reorganization event, each outstanding option will be assumed or an equivalent option or right will be substituted by the successor entity, unless such successor entity does not agree to assume the award or to substitute an equivalent option or right in which case such option will terminate upon the consummation of the merger or reorganization event.

#### *Assumed 2010 Ikaria Plan*

The 2010 Ikaria plan was adopted by Ikaria in February 2010 and amended and restated in May 2010, and we assumed the terms of the 2010 Ikaria plan in connection with the Spin-Out. Pursuant to the terms of the 2010 Ikaria plan, upon our liquidation, dissolution, merger or consolidation, except as otherwise provided in an applicable option or award agreement, each option or award will be (i) treated as provided in the agreement related to the transaction, or (ii) if not so provided in such agreement, each holder of an option or award will be entitled to receive, in respect of each share subject to outstanding options or awards, the same number of stock, securities, cash, property or other consideration that he or she would have received had he or she exercised such options or awards prior to the transaction. The stock, securities, cash, property or other consideration shall remain subject to all of the conditions, restrictions and performance criteria which were applicable to the options and awards prior to any such transaction. If the consideration paid or distributed is not entirely shares of common stock of the acquiring or resulting corporation, the treatment of outstanding options and stock appreciation rights may include the cancellation of outstanding options and stock appreciation rights

upon consummation of the transaction as long as the holders of affected options and stock appreciation rights, at the election of the compensation committee, either:

- have been given a period of at least 15 days prior to the date of the consummation of the transaction to exercise the options or stock appreciation rights (whether or not they were otherwise exercisable); or
- are paid (in cash or cash equivalents) in respect of each share covered by the option or stock appreciation right being cancelled an amount equal to the excess, if any, of the per share price paid or distributed to stockholders in the transaction (the value of any non-cash consideration to be determined by the compensation committee in its sole discretion) over the exercise price of the option or stock appreciation right.

### **2014 Equity Incentive Plan**

In June 2014, our board of directors adopted, and our stockholders approved, the 2014 equity plan. The 2014 equity plan is administered by our board of directors or by a committee appointed by our board of directors. The 2014 equity plan provides for the grant of options. As of September 30, 2014, there were 633,282 shares of non-voting common stock available for the grant of options under the 2014 equity plan.

Our employees, officers, directors, consultants and advisors are eligible to receive awards under the 2014 equity plan. Subject to any limitation in the 2014 equity plan, our board of directors or any committee to which our board of directors has delegated authority will select the recipients of options and determine:

- the number of shares of non-voting common stock covered by options, the dates upon which those options become exercisable and the terms and conditions that apply to such options;
- the exercise price of options which may not be less than 100% of the fair market value of our non-voting common stock on the grant date;
- the duration of options, which may not be in excess of ten years;
- the methods of payment of the exercise price of options; and
- any amendments to the 2014 equity plan and/or any option agreement.

Our board of directors may exercise such powers and perform such acts as it deems necessary or expedient to promote the best interests of the Company which are not in conflict with the 2014 equity plan provisions.

Awards under the 2014 equity plan are subject to adjustment in the event of a split, reverse split, dividend, recapitalization, combination or reclassification of Company common stock, spin-off or other similar change in our capitalization, conversion of the Company into a corporation or other entity or event or any dividend or distribution to holders of our common stock other than an ordinary cash dividend.

Upon a merger or other reorganization event (as defined in the 2014 equity plan), our board of directors, may, in its sole discretion, take any one or more of the following actions pursuant to the 2014 equity plan, as to some or all outstanding options:

- provide that all outstanding options will be assumed, or substantially equivalent awards shall be substituted, by the acquiring or successor corporation or an affiliate thereof;
- upon written notice to a participant, provide that the participant's unvested and/or unexercised options will terminate immediately prior to the consummation of such transaction unless exercised by the participant;
- provide that outstanding options will become exercisable, realizable or deliverable, or restrictions applicable to an option will lapse, in whole or in part, prior to or upon the reorganization event;

- in the event of a reorganization event pursuant to which holders of shares of non-voting common stock will receive a cash payment for each share of non-voting common stock surrendered in the reorganization event, make or provide for a cash payment to the participants with respect to each option held by the participant equal to (1) the number of shares of non-voting common stock subject to the vested portion of the option, after giving effect to any acceleration of vesting that occurs upon or immediately prior to such reorganization event, multiplied by (2) the excess, if any, of the cash payment for each share of non-voting common stock surrendered in the reorganization event over the exercise price of such option and any applicable tax withholdings, in exchange for the termination of such option; and
- provide that, in connection with a liquidation or dissolution, options convert into the right to receive liquidation proceeds.

At any time, our board of directors may, in its sole discretion, provide that any award under the 2014 equity plan will become immediately exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in full or in part.

No option may be granted under the 2014 equity plan after June 20, 2024. Our board of directors may amend, suspend or terminate the 2014 equity plan at any time, except that stockholder approval will be required to comply with applicable law or stock market requirements.

#### ***Public Company Stock Incentive Plan***

We expect our board of directors to adopt, and our stockholders to approve, the public company incentive plan, which will become effective immediately prior to the closing of this offering. The public company incentive plan provides for the grant of incentive stock options, nonstatutory stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards and other stock-based awards. Upon effectiveness of the public company incentive plan, the number of shares of our common stock that will be reserved for issuance under the public company incentive plan will be the sum of (1) \_\_\_\_\_ plus (2) the number of shares (up to \_\_\_\_\_ shares) equal to the sum of the number of shares of our common stock then available for issuance under the 2014 equity plan and the number of shares of our common stock subject to outstanding awards under the 2014 equity plan that expire, terminate or are otherwise surrendered, cancelled, forfeited or repurchased by us at their original issuance price pursuant to a contractual repurchase right plus (3) an annual increase, to be added on the first day of each fiscal year, beginning with the fiscal year ending December 31, \_\_\_\_\_ and continuing until, and including, the fiscal year ending December 31, \_\_\_\_\_, equal to the lowest of \_\_\_\_\_ shares of our common stock, \_\_\_\_\_ % of the number of shares of our common stock outstanding on the first day of the fiscal year and an amount determined by our board of directors.

Our employees, officers, directors, consultants and advisors are eligible to receive awards under the public company incentive plan. However, incentive stock options may only be granted to our employees. The maximum number of shares of our common stock with respect to which awards may be granted to any participant under the public company incentive plan is \_\_\_\_\_ per calendar year. For purposes of this limit on the maximum number of shares that may be awarded to any participant, the combination of an option in tandem with a stock appreciation right will be treated as a single award.

Pursuant to the terms of the public company incentive plan, our board of directors (or a committee delegated by our board of directors) administers the plan and, subject to any limitations in the plan, selects the recipients of awards and determines:

- the number of shares of our common stock covered by options and the dates upon which the options become exercisable;
- the type of options to be granted;
- the duration of options, which may not be in excess of ten years;



- the exercise price of options, which must be at least equal to the fair market value of our common stock on the date of grant; and
- the number of shares of our common stock subject to and the terms of any stock appreciation rights, restricted stock awards, restricted stock units or other stock-based awards and the terms and conditions of such awards, including conditions for repurchase, issue price and repurchase price (though the measurement price of stock appreciation rights must be at least equal to the fair market value of our common stock on the date of grant and the duration of such awards may not be in excess of ten years).

If our board of directors delegates authority to an executive officer to grant awards under the public company incentive plan, the executive officer has the power to make awards to all of our employees, except executive officers. Our board of directors will fix the terms of the awards to be granted by such executive officer, including the exercise price of such awards (which may include a formula by which the exercise will be determined), and the maximum number of shares subject to awards that such executive officer may make.

Upon a merger or other reorganization event, our board of directors may, in its sole discretion, take any one or more of the following actions pursuant to the public company incentive plan as to some or all outstanding awards other than restricted stock:

- provide that all outstanding awards shall be assumed, or substantially equivalent awards shall be substituted, by the acquiring or successor corporation (or an affiliate thereof);
- upon written notice to a participant, provide that all of the participant's unexercised awards will terminate immediately prior to the consummation of such reorganization event unless exercised by the participant;
- provide that outstanding awards shall become exercisable, realizable or deliverable, or restrictions applicable to an award shall lapse, in whole or in part, prior to or upon such reorganization event;
- in the event of a reorganization event pursuant to which holders of shares of our common stock will receive a cash payment for each share surrendered in the reorganization event, make or provide for a cash payment to the participants with respect to each award held by a participant equal to (1) the number of shares of our common stock subject to the vested portion of the award (after giving effect to any acceleration of vesting that occurs upon or immediately prior to such reorganization event) multiplied by (2) the excess, if any, of the cash payment for each share surrendered in the reorganization event over the exercise, measurement or purchase price of such award and any applicable tax withholdings, in exchange for the termination of such award; and/or
- provide that, in connection with a liquidation or dissolution, awards shall convert into the right to receive liquidation proceeds (if applicable, net of the exercise, measurement or purchase price thereof and any applicable tax withholdings).

Our board of directors does not need to take the same action with respect to all awards and may take different actions with respect to portions of the same award.

In the case of certain restricted stock units, no assumption or substitution is permitted, and the restricted stock units will instead be settled in accordance with the terms of the applicable restricted stock unit agreement.

Upon the occurrence of a reorganization event other than a liquidation or dissolution, the repurchase and other rights with respect to outstanding restricted stock awards will continue for the benefit of the successor company and will, unless the board of directors may otherwise determine, apply to the cash, securities or other property into which shares of our common stock are converted or exchanged pursuant to the reorganization event. Upon the occurrence of a reorganization event involving a liquidation or dissolution, all restrictions and conditions on each outstanding restricted stock

award will automatically be deemed terminated or satisfied, unless otherwise provided in the agreement evidencing the restricted stock award.

At any time, our board of directors may, in its sole discretion, provide that any award under the public company incentive plan will become immediately exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in full or in part.

No award may be granted under the public company incentive plan on or after \_\_\_\_\_, 2024. Our board of directors may amend, suspend or terminate the public company incentive plan at any time, except that stockholder approval may be required to comply with applicable law or stock market requirements.

#### **401(k) Retirement Plan**

We maintain a 401(k) retirement plan that is intended to be a tax-qualified defined contribution plan under Section 401(k) of the Internal Revenue Code. In general, all of our employees are eligible to participate, beginning on the first day of the month following commencement of their employment. The 401(k) plan includes a salary deferral arrangement pursuant to which participants may elect to reduce their current compensation by up to the statutorily prescribed limit, equal to \$17,500 in 2014, and have the amount of the reduction contributed to the 401(k) plan.

#### **Limitations on Liability and Indemnification**

Our certificate of incorporation, which will become effective upon the closing of this offering, limits the personal liability of directors for breach of fiduciary duty to the maximum extent permitted by the Delaware General Corporation Law and provides that no director will have personal liability to us or to our stockholders for monetary damages for breach of fiduciary duty or other duty as a director. However, these provisions do not eliminate or limit the liability of any of our directors:

- for any breach of the director's duty of loyalty to us or our stockholders;
- for acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law;
- for voting for or assenting to unlawful payments of dividends, stock repurchases or other distributions; or
- for any transaction from which the director derived an improper personal benefit.

Any amendment to or repeal of these provisions will not eliminate or reduce the effect of these provisions in respect of any act, omission or claim that occurred or arose prior to such amendment or repeal. If the Delaware General Corporation Law is amended to provide for further limitations on the personal liability of directors of corporations, then the personal liability of our directors will be further limited to the greatest extent permitted by the Delaware General Corporation Law.

In addition, our certificate of incorporation, which will become effective upon the closing of this offering, provides that we must indemnify our directors and officers and we must advance expenses, including attorneys' fees, to our directors and officers in connection with legal proceedings, subject to very limited exceptions.

In addition, we intend to enter into indemnification agreements with each of our directors and officers prior to the closing of this offering. These indemnification agreements may require us, among other things, to indemnify each such director or officer for some expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by him or her in any action or proceeding arising out of his or her service as one of our directors or officers.

We maintain a general liability insurance policy that covers certain liabilities of our directors and officers arising out of claims based on acts or omissions in their capacities as directors or officers.

Certain of our non-employee directors may, through their relationships with their employers, be insured and/or indemnified against certain liabilities incurred in their capacity as members of our board of directors.

#### **Rule 10b5-1 Sales Plans**

Our directors and executive officers may adopt written plans, known as Rule 10b5-1 plans, in which they will contract with a broker to buy or sell shares of our common stock on a periodic basis. Under a Rule 10b5-1 plan, a broker executes trades pursuant to parameters established by the director or officer when entering into the plan, without further direction from the director or officer. The director or officer may adopt, amend or terminate a plan when not in possession of material, non-public information. In addition, our directors and executive officers may also buy or sell additional shares outside of a Rule 10b5-1 plan when they are not in possession of material, nonpublic information.

#### **Director Compensation**

Our board of directors intends to approve a compensation policy for our non-employee directors that will become effective upon the closing of this offering. This policy will be intended to provide a total compensation package that enables us to attract and retain qualified and experienced individuals to serve as directors and to align our directors' interests with those of our stockholders.

We pay our independent director, Howard Pien, cash compensation in the amount of \$80,000 per year paid quarterly in arrears.

## CERTAIN RELATIONSHIPS AND RELATED PERSON TRANSACTIONS

We describe below transactions and series of similar transactions during our last three fiscal years to which we were a party or will be a party, in which (i) the amounts involved exceeded or will exceed \$120,000, and (ii) any of our directors, executive officers, or holders of more than 5% of our capital stock, or any member of the immediate family of the foregoing persons, had or will have a direct or indirect material interest. Compensation arrangements for our directors and executive officers are described elsewhere in this prospectus. We believe that all of these transactions were on terms as favorable as could have been obtained from unrelated third parties.

### **Corporate Conversion**

We are currently a Delaware limited liability company. Prior to the effectiveness of the registration statement of which this prospectus forms a part, we will complete transactions pursuant to which we will convert into a Delaware corporation and change our name to Bellerophon Therapeutics, Inc. As required by the limited liability company agreement of Bellerophon Therapeutics LLC, the conversion has been approved by the board of directors of Bellerophon Therapeutics LLC. In connection with the Corporate Conversion, holders of our outstanding voting units will receive one share of voting common stock for each voting unit held immediately prior to the Corporate Conversion, holders of our outstanding non-voting units will receive one share of non-voting common stock for each non-voting unit held immediately prior to the Corporate Conversion and options to purchase non-voting units will become options to purchase one non-voting share of common stock for each unit underlying such options immediately prior to the Corporate Conversion, at the same aggregate exercise price in effect prior to the Corporate Conversion.

Following the Corporate Conversion and prior to our registration statement being declared effective, certain entities affiliated with certain of our principal stockholders will be merged with and into us. We refer to these mergers as the Mergers. In connection with the conversion and the Mergers, these certain entities affiliated with certain of our principal stockholders will receive, in exchange for their equity interests in the entities being merged into us, the number of shares of our common stock that they would have held had they held our equity interests directly.

In connection with the Corporate Conversion, we intend to enter into the following agreements:

### ***Merger Agreement***

We intend to enter into a merger agreement with certain of our principal stockholders to effect the Mergers. Concurrently with the consummation of the conversion to a corporation, our limited liability company agreement, or the LLC agreement, will be terminated (other than the provisions thereof relating to certain pre-closing tax matters and liabilities for breaches of the LLC agreement).

In the merger agreement, the companies that will be merged into us will represent and warrant that they do not have any liabilities, operations or businesses other than activities related to holding our common stock and other than liabilities for (i) deferred income taxes that reflect only timing differences between the treatment of items for accounting and income tax purposes and (ii) income taxes with respect to pre-closing periods which are not yet due and payable and for which we are fully indemnified. The Mergers will be structured so that we will not acquire any assets (other than certain income tax receivables and an amount of cash that has been estimated in good faith to be sufficient to pay all pre-closing income taxes of the entities to be merged into us) or be responsible for any liabilities other than (i) deferred income taxes that reflect only timing differences between the treatment of items for accounting and income tax purposes and (ii) income taxes with respect to pre-closing periods which are not yet due and payable and for which we are fully indemnified. Each of our principal stockholders party to the merger agreement will indemnify us with respect to any liabilities (including tax liabilities related to pre-closing periods, other than with respect to deferred

income tax liabilities that reflect only timing differences between the treatment of items for accounting and income tax purposes) of the entity related to such principal stockholder that we acquire in the merger. Any assets (other than our equity interests, certain income tax receivables and an amount of cash that has been estimated in good faith to be sufficient to pay all liabilities, including pre-closing income taxes, of the entities to be merged into us) in the entities to be merged into us will be distributed to the equity holders of those entities prior to the Mergers.

### **Registration Rights Agreement**

We intend to enter into a registration rights agreement with certain holders of our common stock, including our 5% stockholders and their affiliates and entities affiliated with our directors. The registration rights agreement will provide these holders the right, following the completion of this offering, to demand that we file a registration statement or request that their shares be covered by a registration statement that we are otherwise filing. See "Description of Capital Stock—Registration Rights" for additional information regarding these registration rights.

### **Stockholders Agreement**

We intend to enter into a stockholders agreement with the New Mountain Entities, which will remain in effect following this offering. The stockholders agreement will provide that, following the closing of the offering, the New Mountain Entities will be entitled to nominate one director to our board of directors and to the board of directors (or equivalent governing body) of each of our subsidiaries and to appoint the lead non-employee director of our board of directors, in each case, for so long as the New Mountain Entities and their assignees beneficially own (i) 50% or more of the sum of (a) the number of shares of our common stock that they own immediately prior to the closing of this offering and (b) the number of shares of common stock, if any, acquired following the closing of this offering (subject to in each case adjustment in the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification or other similar change in our capitalization) and (ii) at least 15% of our common stock outstanding (as set forth on the cover of our then most recently filed annual report on Form 10-K or quarterly report on Form 10-Q). Subject to the same ownership thresholds, following the closing of this offering, the director nominated by the New Mountain Entities will be entitled to serve on each committee of our board of directors and of the board of directors (or equivalent governing body) of each of our subsidiaries and the consent of the New Mountain Entities will be required to establish any new committee of our board of directors or the board of directors (or equivalent governing body) of any of our subsidiaries, in each case except to the extent prohibited by applicable law or applicable listing exchange rules.

In addition, the stockholders agreement will provide that, following the closing of this offering, we will be required to obtain the prior written approval of the New Mountain Entities to take certain actions, including, among other things, actions to:

- consolidate or merge into or with any other person, sell, lease or transfer all or a significant portion of our assets or capital stock to another person or enter into any other similar business combination transaction, or effect a liquidation;
- authorize, issue, sell, offer for sale or solicit offers to buy any shares of our common stock or any convertible securities or any other equity or debt securities or rights to acquire any of our or our subsidiaries' equity or debt securities, subject to certain exceptions, including among other things, the issuance under our stock incentive plan of grants that have been approved by our board of directors (or a board committee) and at least one director appointed by the New Mountain Entities;
- incur indebtedness or refinance any indebtedness, in each case in an amount in excess of a specified threshold;

- hire or replace our chief executive officer; or
- agree or otherwise commit to do any of the foregoing (unless the commitment is conditioned on obtaining the approval of the New Mountain Entities).

These approval rights of the New Mountain Entities will terminate following the closing of this offering when the New Mountain Entities and their respective assignees beneficially own either (i) less than 50% of the sum of (a) the aggregate number of shares of our common stock that they collectively own immediately prior to the closing of this offering and (b) the number of shares of our common stock, if any, acquired following the closing of this offering (subject to in each case adjustment in the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification or similar changes in our capitalization) or (ii) less than 15% of our common stock outstanding (as set forth on the cover of our then most recently filed annual report on Form 10-K or quarterly report on Form 10-Q). Following this offering, we expect the New Mountain Entities to hold      % of our outstanding common stock (or      % if the underwriters exercise in full their option to purchase additional shares from us).

### ***Management Rights Letters***

We intend to enter into management rights letters with entities affiliated with certain of our principal stockholders, pursuant to which such entities will be entitled to routinely consult with and advise management regarding our operations and have the right to inspect our books and records. We will also be required to deliver financial statements to such entities within 45 days after the end of each of the first three quarters of each fiscal year and 120 days after the end of each fiscal year and any other periodic reports as soon as they become available. Each management rights letter will terminate on the date the entity party thereto no longer holds any of our securities.

### **Indemnification Agreements**

Our certificate of incorporation in effect upon the closing of this offering provides that we will indemnify our directors and officers to the fullest extent permitted by Delaware law. In addition, we intend to enter into indemnification agreements with each of our directors and officers prior to the closing of this offering. See "Executive Compensation—Limitations on Liability and Indemnification" for additional information regarding these agreements.

### **Relationship with Ikaria**

Prior to the Spin-Out on February 12, 2014, we were a wholly-owned subsidiary of Ikaria. See "Business—Relationship with Ikaria after the Spin-Out." Following the Spin-Out, Ikaria ceased to hold any of our equity interests and we became a stand-alone company.

### ***Separation and Distribution Agreement***

In connection with the Spin-Out, we and Ikaria entered into a separation and distribution agreement which sets forth the key provisions relating to the separation of our business from Ikaria's other businesses. The separation and distribution agreement described the assets and liabilities that remained with or were transferred to us and those that remained with or were transferred to Ikaria and the terms of Ikaria's distribution of all of our then outstanding units to its stockholders. The separation and distribution agreement provides for a full and complete release and discharge of all liabilities between Ikaria and us, except as set forth in the agreement. We and Ikaria each agreed to indemnify, defend and hold harmless the other party and its subsidiaries, and each of their respective past and present directors, officers and employees, and each of their respective permitted successors and assigns, from any and all damages relating to, arising out of or resulting from, among other things, our business and certain additional specified liabilities or Ikaria's business and certain additional specified liabilities,

as applicable. The separation and distribution agreement also provides that we and Ikaria will each use reasonable best efforts, including by cooperating with the other party, to, among other things, effect the transfer of any assets being transferred in connection with the Spin-Out that had not been transferred as of the date of the Spin-Out.

In connection with the Spin-Out, we and Ikaria have entered into other agreements that will govern various interim and ongoing relationships between us and Ikaria. These agreements, the material terms of which are summarized below, include:

- a transition services agreement;
- an exclusive cross-license, technology transfer, and regulatory matters agreement;
- an employee matters agreement;
- agreements not to compete; and
- drug and device supply agreements.

The principal agreements described below are filed as exhibits to the registration statement to which this prospectus forms a part, and the summaries of each of these agreements below set forth the terms of the agreements that we believe are material. These summaries are qualified in their entirety by reference to the full text of the applicable agreements, which are incorporated by reference into this prospectus.

#### ***Transition Services Agreement***

In February 2014, we entered into the TSA. Pursuant to the terms and conditions of the TSA, Ikaria has agreed to use commercially reasonable efforts to provide certain services to us, including human resources support, real estate support, information technology support, accounting and tax support, treasury support, financial planning and analysis support, purchasing support, management/executive services, legal services, quality services, regulatory services, drug and device safety services, business development support, biometrics support and manufacturing support. Ikaria is obligated, subject to the terms of the TSA (including the early termination provisions thereof and our obligation to use commercially reasonable efforts to provide the services for ourselves as soon as practicable), to provide such services until February 2016.

Ikaria has also agreed, on the terms and subject to the conditions of the TSA, to use commercially reasonable efforts to allow our employees to remain in Ikaria's Hampton, New Jersey facility for the continued operation of our business during the term of the TSA.

We are obligated to pay Ikaria a service fee in the amount of \$772,000 per month and to reimburse Ikaria for any out-of-pocket expenses incurred in connection with its provisions of services under the TSA, any taxes imposed on Ikaria in connection with the performance or delivery of services under the TSA and any costs and expenses incurred by Ikaria in connection with the performance of any services that require resources outside of the existing resources of Ikaria or that otherwise interfere with the ordinary operations of Ikaria's business. This monthly service fee is payable by us regardless of the frequency or quantity of services actually utilized by us under the TSA, and our obligation to pay such monthly service fee for 24 months will survive any early termination of the TSA. We are also obligated to pay any fees, costs, expenses or other amounts incurred by Ikaria to obtain the right to allow our employees to remain in the Hampton, New Jersey facility during the term of the TSA. At the time of the Spin-Out, we deposited the sum of \$18.5 million into escrow, representing the aggregate of the \$772,000 monthly service fees payable by the Company under the TSA, to guarantee payment of the monthly service fees by us.

### ***Exclusive Cross-License, Technology Transfer and Regulatory Matters Agreement***

In February 2014, we entered into an exclusive cross-license, technology transfer and regulatory matters agreement with Ikaria. Pursuant to the terms of the license agreement, Ikaria granted to us a fully paid-up, non-royalty bearing, exclusive license under specified intellectual property rights controlled by Ikaria to engage in the development, manufacture and commercialization of nitric oxide, devices to deliver nitric oxide and related services for or in connection with out-patient, chronic treatment of patients with PAH, PH-COPD or PH-IPF, which we refer to collectively as the Bellerophon indications.

We have granted to Ikaria a fully paid-up, non-royalty-bearing, exclusive license under specified intellectual property rights that we control to engage in the development, manufacture and commercialization of products and services for or used in connection with the diagnosis, prevention or treatment, whether in- or out-patient, of certain conditions and diseases other than the Bellerophon indications and for the use of nitric oxide to treat or prevent conditions that are primarily managed in the hospital, which we refer to collectively as the Ikaria nitric oxide business.

We have agreed that, during the term of the license agreement, we will not, without the prior written consent of Ikaria, grant a sublicense under any of the intellectual property licensed to us under the license agreement to any of our affiliates or any third party, in either case, that directly or indirectly competes with the Ikaria nitric oxide business. We have also agreed that we will include certain restrictions in our agreements with customers of our products to ensure that such products will only be used for the Bellerophon indications.

The license agreement will expire on a product-by-product basis for products for a specific Bellerophon indication at such time as we are no longer developing or commercializing any product for such indication. The license agreement may be terminated by either party in the event an act or order of a court or governmental authority prohibits either party from substantially performing under the license agreement. Either party may also terminate the license agreement in the event of an uncured material breach by the other party or in the event the other party is insolvent or in bankruptcy proceedings. Ikaria may also terminate the license agreement if we or any of our affiliates breach the agreements not to compete described below, or if we or any successor to our rights under the license agreement markets a generic nitric oxide product that is competitive with INOmax. Under certain circumstances, if the license agreement is terminated, the licenses granted to Ikaria by us will survive such termination.

### ***Employee Matters Agreement***

In February 2014, we entered into an employee matters agreement with Ikaria, pursuant to which the employment of certain Ikaria employees was transferred to us or our subsidiaries on the terms and conditions set forth therein. The employee matters agreement also sets forth the treatment of outstanding Ikaria stock options and RSUs in connection with the Spin-Out. We have agreed to assume and pay, perform, fulfill and discharge, in accordance with the terms of the employee matters agreement, all liabilities to or relating to such transferred employees. Effective as of the date of the Spin-Out, such transferred employees terminated participation in Ikaria's employee benefit plans, and we or our subsidiaries adopted employee benefit plans substantially similar to the following Ikaria plans: a 401(k) plan, a medical and dental plan, long-term disability, short-term disability, life and accidental death and dismemberment and flexible spending accounts, pursuant to the terms of the employee matters agreement.

### ***Agreements Not to Compete***

In September 2013, October 2013 and February 2014, we and each of our subsidiaries entered into an agreement not to compete with a subsidiary of Ikaria, which we refer to collectively as the



agreements not to compete. Pursuant to the agreements not to compete, we and each of our subsidiaries agreed not to engage, anywhere in the world, in any manner, directly or indirectly, until the earlier of five years after the effective date of such agreement not to compete or the date on which Ikaria and all of its subsidiaries are no longer engaged in such business, in:

- the development, manufacture, commercialization, promotion, sale, import, export, servicing, repair, training, storage, distribution, transportation, licensing or other handling or disposition of any product or service (including, without limitation, any product or service that utilizes, contains or includes nitric oxide for inhalation, a device intended to deliver nitric oxide or a service that delivers or supports the delivery of nitric oxide), bundled or unbundled, for or used in connection with (a) the diagnosis, prevention or treatment, in both adult and/or pediatric populations, and whether in- or out-patient, of: (i) hypoxic respiratory failure associated with pulmonary hypertension, (ii) pulmonary hypertensive episodes and right heart failure associated with cardiovascular surgery, (iii) bronchopulmonary dysplasia, (iv) the management of ventilation-perfusion mismatch in acute lung injury, (v) the management of ventilation-perfusion mismatch in acute respiratory distress syndrome, (vi) the management of pulmonary hypertension episodes and right heart failure in congestive heart failure, (vii) pulmonary edema from high altitude sickness, (viii) the management of pulmonary hypertension episodes and right heart failure in pulmonary or cardiac surgery, (ix) the management of pulmonary hypertension episodes and right heart failure in organ transplant, (x) sickle cell vaso-occlusive crisis, (xi) hypoxia associated with pneumonia or (xii) ischemia-reperfusion injury or (b) the use of nitric oxide to treat or prevent conditions that are primarily managed in the hospital; or
- any and all development, manufacture, commercialization, promotion, sale, import, export, storage, distribution, transportation, licensing, or other handling or disposition of any terlipressin or any other product within the pressin family, (a) intended to treat (i) hepatorenal syndrome in any form, (ii) bleeding esophageal varices or (iii) septic shock or (b) for or in connection with the management of low blood pressure.

The agreements not to compete expressly exclude the Bellerophon indications.

### **Supply Agreements**

*Device Clinical Supply Agreement.* In February 2014, we entered into the device supply agreement, pursuant to which Ikaria will use commercially reasonable efforts to manufacture and supply our requirements for certain nitric oxide delivery devices specified in the device supply agreement for use in our clinical programs for PAH and PH-COPD. Pursuant to the device supply agreement, we will pay to Ikaria an amount equal to Ikaria's internal and external manufacturing cost plus 20%. The device supply agreement will expire on February 9, 2015. In addition, either party may terminate the device supply agreement in the event of an uncured material breach by the other party.

*Drug Clinical Supply Agreement.* In February 2014, we entered into the drug supply agreement, pursuant to which Ikaria has agreed to use commercially reasonable efforts to manufacture and supply, and we have agreed to acquire from Ikaria, our requirements for nitric oxide for inhalation and corresponding placebo for use in our clinical programs for PAH, PH-COPD and PH-IPF. Pursuant to the drug supply agreement, we will pay to Ikaria an amount equal to Ikaria's internal and external manufacturing cost plus 20%. Under the terms of the drug supply agreement, we have also granted Ikaria a right of first negotiation in the event that we desire to obtain supply of nitric oxide for inhalation and corresponding placebo (or any variant thereof or any version with different specifications) for commercial use. The drug supply agreement will expire on a product-by-product basis on the date we discontinue clinical development of such product. In addition, either party may terminate the drug supply agreement in the event of an uncured material breach by the other party.

### ***Directors and Officers of Ikaria***

Daniel Tassé, a member of our board of directors, currently serves as President and Chief Executive Officer and is a member of the board of directors of Ikaria. Matthew Holt, a member of our board of directors, is a member of the board of directors of Ikaria.

### **Policies and Procedures for Related Person Transactions**

Our board of directors has adopted written policies and procedures for the review of any transaction, arrangement or relationship in which we were or are to be a participant, the amount involved exceeds \$120,000 and one of our executive officers, directors, director nominees or 5% stockholders, or their immediate family members, each of whom we refer to as a "related person," has a direct or indirect material interest.

If a related person proposes to enter into such a transaction, arrangement or relationship, which we refer to as a "related person transaction," the related person must report the proposed related person transaction to our . The policy calls for the proposed related person transaction to be reviewed and, if deemed appropriate, approved by our audit committee. Whenever practicable, the reporting, review and approval will occur prior to entry into the transaction. If advance review and approval is not practicable, the audit committee will review, and, in its discretion, may ratify the related person transaction. The policy also permits the chairman of the audit committee to review and, if deemed appropriate, approve proposed related person transactions that arise between committee meetings, subject to ratification by the committee at its next meeting. Any related person transactions that are ongoing in nature will be reviewed annually.

A related person transaction reviewed under the policy will be considered approved or ratified if it is authorized by the audit committee after full disclosure of the related person's interest in the transaction. As appropriate for the circumstances, the committee will review and consider:

- the related person's interest in the related person transaction;
- the approximate dollar value of the amount involved in the related person transaction;
- the approximate dollar value of the amount of the related person's interest in the transaction without regard to the amount of any profit or loss;
- whether the transaction was undertaken in the ordinary course of our business;
- whether the terms of the transaction are no less favorable to us than terms that could have been reached with an unrelated third party;
- the purpose of, and the potential benefits to us of, the transaction; and
- any other information regarding the related person transaction or the related person in the context of the proposed transaction that would be material to investors in light of the circumstances of the particular transaction.

The audit committee may approve or ratify the transaction only if the committee determines that, under all of the circumstances, the transaction is in our best interests. The committee may impose any conditions on the related person transaction that it deems appropriate.

In addition to the transactions that are excluded by the instructions to the SEC's related person transaction disclosure rule, our board of directors has determined that the following transactions do not create a material direct or indirect interest on behalf of related persons and, therefore, are not related person transactions for purposes of this policy:

- interests arising solely from the related person's position as an executive officer of another entity (whether or not the person is also a director of such entity) that is a participant in the

transaction, where (a) the related person and all other related persons own in the aggregate less than a 10% equity interest in such entity, (b) the related person and his or her immediate family members are not involved in the negotiation of the terms of the transaction and do not receive any special benefits as a result of the transaction and (c) the amount involved in the transaction is less than the greater of \$200,000 or 5% of the annual gross revenues of the company receiving payment under the transaction; and

- a transaction that is specifically contemplated by provisions of our charter or bylaws.

The policy provides that transactions involving compensation of executive officers shall be reviewed and approved by the compensation committee in the manner specified in its charter.

We did not have a written policy regarding the review and approval of related person transactions prior to this offering. Nevertheless, with respect to such transactions, it was our policy for our board of directors to consider the nature of and business reason for such transactions, how the terms of such transactions compared to those which might be obtained from unaffiliated third parties and whether such transactions were otherwise fair to and in the best interests of, or not contrary to, our best interests. In addition, all related person transactions required prior approval, or later ratification, by our board of directors.

## PRINCIPAL STOCKHOLDERS

The following table sets forth information with respect to the beneficial ownership of our common stock as of September 30, 2014, by:

- each of our directors;
- each of our executive officers;
- all of our directors and executive officers as a group; and
- each person, or group of affiliated persons, who is known by us to beneficially own more than 5% of our common stock.

The column entitled "Percentage of Shares Beneficially Owned—Before Offering" is based on a total of 98,919,412 shares of our common stock outstanding as of September 30, 2014, after giving effect to the Corporate Conversion and assuming the conversion of our non-voting shares into voting shares of our common stock upon the closing of this offering. The column entitled "Percentage of Shares Beneficially Owned—After Offering" is based on shares of our common stock to be outstanding after this offering, including the shares of our common stock that we are selling in this offering, but not including any additional shares issuable upon exercise of outstanding stock options or upon exercise of the underwriters' option to purchase additional shares.

Beneficial ownership is determined in accordance with the rules and regulations of the SEC and includes voting or investment power with respect to our common stock. Shares of our common stock subject to options that are currently exercisable or exercisable within 60 days of September 30, 2014 are considered outstanding and beneficially owned by the person holding the options for the purpose of calculating the percentage ownership of that person but not for the purpose of calculating the percentage ownership of any other person. Except as otherwise noted, the persons and entities in this table have sole voting and investing power with respect to all of the shares of our common stock beneficially owned by them, subject to community property laws, where applicable. Except as otherwise set forth below, the address of the beneficial owner is c/o Bellerophon Therapeutics, Inc., 53 Frontage Road, Suite 301, Hampton, New Jersey 08827.

Following the completion of this offering, the New Mountain Entities will be entitled to nominate one member of our board of directors and will continue to have approval rights over many corporate actions. For a description of the stockholders agreement and any other material relationships the New Mountain Entities and the other principal stockholders have with us, see "Certain Relationships and Related Person Transactions."

The table below represents the number of shares owned by each stockholder included in the table (but without taking into account that certain stockholders may be part of a group) to provide investors information concerning the economic ownership of each stockholder.

Name of Beneficial Owner	Shares Beneficially Owned	Percentage of Shares Beneficially Owned	
		Before Offering	After Offering
5% Stockholders			
New Mountain Entities(1)	47,468,903	47.99%	%
Linde(2)	15,918,769	16.09%	%
ARCH(3)	9,431,782	9.53%	%
Venrock(4)	9,400,532	9.50%	%
Executive Officers and Directors			
Jonathan M. Peacock(5)	1,128,343	1.13%	%
Manesh Naidu(6)	201,000	*	%
Reinilde Heyrman	100,000	*	%
Martin Meglasson(7)	180,000	*	%
David Abrams(8)	20,000	*	%
Aldo E. Belloni, Ph.D.(9)	15,918,769	16.09%	%
Matthew S. Holt(10)	47,468,903	47.99%	%
Andre V. Moura	—	*	%
Robert Nelsen(11)	9,431,782	9.53%	%
Howard Pien(12)	102,500	*	%
Daniel Tassé(13)	2,501,400	2.50%	%
Adam B. Weinstein(14)	47,468,903	47.99%	%
All executive officers and directors as a group (12 persons)(15)	77,052,697	75.88%	%

\* Less than one percent.

- (1) Consists of 3,389,078 shares held, prior to the Corporate Conversion, by Allegheny New Mountain Partners, L.P., 783,009 shares held by New Mountain Affiliated Investors II, L.P. and 43,296,816 shares held by New Mountain Partners II (AIV-A), L.P. The general partner of each of the New Mountain Entities is New Mountain Investments II, L.L.C. and the manager of each of the New Mountain Entities is New Mountain Capital L.L.C. Steven Klinsky is the managing member of New Mountain Investments II, L.L.C. Adam Weinstein, a member of our board of directors, is a member of New Mountain Investments II, L.L.C. Matthew Holt, a member of our board of directors, is a member of New Mountain Investments II, L.L.C. New Mountain Investments II, L.L.C. has decision-making power over the disposition and voting of shares of portfolio investments of each of the New Mountain Entities. New Mountain Capital, L.L.C. also has voting power over the shares of portfolio investments of the New Mountain Entities in its role as the investment advisor. New Mountain Capital, L.L.C. is a wholly-owned subsidiary of New Mountain Capital Group, L.L.C. New Mountain Capital Group, L.L.C. is 100% owned by Steven Klinsky. Since New Mountain Investments II, L.L.C. has decision-making power over the New Mountain Entities, Mr. Klinsky may be deemed to beneficially own the shares that the New Mountain Entities hold of record or may be deemed to beneficially own. Mr. Klinsky, Mr. Weinstein, Mr. Holt, New Mountain Investments II, L.L.C. and New Mountain Capital, L.L.C. disclaim beneficial ownership over the shares held by the New Mountain Entities, except to the extent of their pecuniary interest therein.
- (2) Consists of 15,918,769 shares held by Linde North America, Inc., an indirect wholly-owned subsidiary of Linde AG. Aldo Belloni, a member of our board of directors, is a Member of the

Executive Board of Linde AG. Dr. Belloni disclaims beneficial ownership of all shares held by Linde, except to the extent of his pecuniary interest therein, if any.

- (3) Consists of 9,431,782 shares that following the Corporate Conversion will be held by ARCH Venture Fund VI, L.P., or ARCH VI. ARCH Venture Partners VI, L.P., or the GPLP, as the sole general partner of ARCH VI, may be deemed to beneficially own certain of the shares held of record by ARCH VI. The GPLP disclaims beneficial ownership of all shares held of record by ARCH VI in which the GPLP does not have an actual pecuniary interest. ARCH Venture Partners VI, LLC, or the GPLLC, as the sole general partner of the GPLP, may be deemed to beneficially own certain of the shares held of record by ARCH VI. The GPLLC disclaims beneficial ownership of all shares held of record by ARCH VI in which it does not have an actual pecuniary interest. Keith Crandell, Clinton Bybee and Robert Nelsen, a member of our board of directors, are the managing directors of the GPLLC and may be deemed to beneficially own certain of the shares held of record by ARCH VI. The managing directors disclaim beneficial ownership of all shares held of record by ARCH VI in which they do not have an actual pecuniary interest.
- (4) Consists of 7,652,033 shares that following the Corporate Conversion will be held by Venrock Associates IV, L.P.; 1,560,489 shares that will be held by Venrock Partners, L.P. and 188,010 shares that will be held by Venrock Entrepreneurs Fund IV, L.P. Venrock Management IV, LLC, Venrock Partners Management, LLC and VEF Management IV, LLC are the sole general partners of Venrock Associates IV, L.P., Venrock Partners, L.P. and Venrock Entrepreneurs Fund IV, L.P., respectively. Venrock Management IV, LLC, Venrock Partners Management, LLC and VEF Management IV, LLC disclaim beneficial ownership of all shares held by Venrock Associates IV, L.P., Venrock Partners, L.P. and Venrock Entrepreneurs Fund IV, L.P., except to the extent of their pecuniary interest therein.
- (5) Consists of 1,128,343 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2014.
- (6) Includes 78,000 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2014.
- (7) Includes 100,000 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2014.
- (8) Includes 20,000 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2014.
- (9) Consists of 15,918,769 shares held by Linde North America, Inc., an indirect wholly-owned subsidiary of Linde AG. Aldo Belloni, a member of our board of directors, is a Member of the Executive Board of Linde AG. Dr. Belloni disclaims beneficial ownership of all shares held by Linde, except to the extent of his pecuniary interest therein, if any.
- (10) Consists of 3,389,078 shares held, prior to the Corporate Conversion, by Allegheny New Mountain Partners, L.P., 783,009 shares held by New Mountain Affiliated Investors II, L.P. and 43,296,816 shares held by New Mountain Partners II (AIV-A), L.P. The general partner of each of the New Mountain Entities is New Mountain Investments II, L.L.C. and the manager of each of the New Mountain Entities is New Mountain Capital L.L.C. Matthew Holt, a member of our board of directors, is a member of New Mountain Investments II, L.L.C. New Mountain Investments II, L.L.C. has decision-making power over the disposition and voting of shares of portfolio investments of each of the New Mountain Entities. New Mountain Capital, L.L.C. also has voting power over the shares of portfolio investments of the New Mountain Entities in its role as the investment advisor. New Mountain Capital, L.L.C. is a wholly-owned subsidiary of New Mountain Capital Group, L.L.C. Mr. Holt disclaims beneficial ownership over the shares held by the New Mountain Entities, except to the extent of his pecuniary interest therein.

- (11) Consists of 9,431,782 shares that following the Corporate Conversion will be held by ARCH Venture Fund VI, L.P., or ARCH VI. ARCH Venture Partners VI, L.P., or the GPLP, as the sole general partner of ARCH VI, may be deemed to beneficially own certain of the shares held of record by ARCH VI. The GPLP disclaims beneficial ownership of all shares held of record by ARCH VI in which the GPLP does not have an actual pecuniary interest. ARCH Venture Partners VI, LLC, or the GPLLC, as the sole general partner of the GPLP, may be deemed to beneficially own certain of the shares held of record by ARCH VI. The GPLLC disclaims beneficial ownership of all shares held of record by ARCH VI in which it does not have an actual pecuniary interest. Robert Nelsen, a member of our board of directors, is a managing director of the GPLLC and may be deemed to beneficially own certain of the shares held of record by ARCH VI. Mr. Nelsen disclaims beneficial ownership of all shares held of record by ARCH VI in which he does not have an actual pecuniary interest.
- (12) Includes 102,500 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2014.
- (13) Includes 1,200,000 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2014.
- (14) Consists of 3,389,078 shares held, prior to the Corporate Conversion, by Allegheny New Mountain Partners, L.P., 783,009 shares held by New Mountain Affiliated Investors II, L.P. and 43,296,816 shares held by New Mountain Partners II (AIV-A), L.P. The general partner of each of the New Mountain Entities is New Mountain Investments II, L.L.C. and the manager of each of the New Mountain Entities is New Mountain Capital L.L.C. Adam Weinstein, a member of our board of directors, is a member of New Mountain Investments II, L.L.C. New Mountain Investments II, L.L.C. has decision-making power over the disposition and voting of shares of portfolio investments of each of the New Mountain Entities. New Mountain Capital, L.L.C. also has voting power over the shares of portfolio investments of the New Mountain Entities in its role as the investment advisor. New Mountain Capital, L.L.C. is a wholly-owned subsidiary of New Mountain Capital Group, L.L.C. Mr. Weinstein disclaims beneficial ownership over the shares held by the New Mountain Entities, except to the extent of his pecuniary interest therein.
- (15) Includes 2,628,843 shares of common stock issuable upon the exercise of options exercisable within 60 days after September 30, 2014.

## DESCRIPTION OF CAPITAL STOCK

### General

The following description of our capital stock and provisions of our certificate of incorporation and bylaws are summaries and are qualified by reference to the certificate of incorporation and the bylaws that will be in effect upon the closing of this offering. We have filed copies of these documents with the SEC as exhibits to our registration statement of which this prospectus forms a part. The description of the capital stock reflects changes to our capital structure that will occur upon the closing of this offering.

Upon the closing of this offering, our authorized capital stock will consist of 125,000,000 shares of our common stock, \$0.01 par value per share, and 5,000,000 shares of our preferred stock, \$0.01 par value per share, all of which preferred stock will be undesignated.

As of September 30, 2014, after giving effect to the Corporate Conversion, we had issued and outstanding:

- 98,919,412 shares of our voting and non-voting common stock held by 251 stockholders of record; and
- options to purchase 13,754,598 shares of our non-voting common stock, at a weighted average exercise price of \$0.80 per share.

### Common Stock

Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. Each election of directors by our stockholders will be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Holders of common stock are entitled to receive proportionately any dividends as may be declared by our board of directors, subject to any preferential dividend rights of outstanding preferred stock.

In the event of our liquidation or dissolution, the holders of our common stock are entitled to receive proportionately all assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any of our outstanding preferred stock. Holders of our common stock have no preemptive, subscription, redemption or conversion rights. The rights, preferences and privileges of holders of our common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of our preferred stock that we may designate and issue in the future.

### Preferred Stock

Under the terms of our certificate of incorporation that will become effective upon the closing of this offering, our board of directors is authorized to issue shares of preferred stock in one or more series without stockholder approval. Our board of directors has the discretion to determine the rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences, of each series of preferred stock.

The purpose of authorizing our board of directors to issue preferred stock and determine its rights and preferences is to eliminate delays associated with a stockholder vote on specific issuances. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions, future financings and other corporate purposes, could have the effect of making it more difficult for a third party to acquire, or could discourage a third party from seeking to acquire, a majority of our outstanding voting stock. Upon the closing of this offering, there will be no shares of preferred stock outstanding, and we have no present plans to issue any shares of preferred stock.



## Options

As of September 30, 2014, after giving effect to the Corporate Conversion, we had outstanding options to purchase 13,754,598 shares of our common stock, at a weighted average exercise price of \$0.80 per share.

## Stockholders Agreement

We intend to enter into a stockholders agreement with the New Mountain Entities, which will remain in effect following this offering. The stockholders agreement will provide that, following the closing of the offering, the New Mountain Entities will be entitled to nominate one director to our board of directors and to the board of directors (or equivalent governing body) of each of our subsidiaries and to appoint the lead non-employee director, in each case, for so long as the New Mountain Entities and their respective assignees beneficially own (i) 50% or more of the sum of (a) the number of shares of our common stock that they own immediately prior to the closing of this offering and (b) the number of shares of our common stock, if any, acquired following the closing of this offering (subject in each case to adjustment in the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification or other similar change in our capitalization) and (ii) at least 15% of our common stock outstanding (as set forth on the cover of our then most recently filed annual report on Form 10-K or quarterly report on Form 10-Q). Subject to the same ownership thresholds, following the closing of this offering, the director nominated by the New Mountain Entities will be entitled to serve on each committee of our board of directors and of the board of directors (or equivalent governing body) of each of our subsidiaries and the consent of the New Mountain Entities will be required to establish any new committee of our board of directors or the board of directors (or equivalent governing body) of our subsidiaries, in each case except to the extent prohibited by applicable law or applicable listing exchange rules.

In addition, the stockholders agreement will provide that, following the closing of this offering, we will be required to obtain the prior written approval of the New Mountain Entities to take certain actions, including, among other things, actions to:

- consolidate or merge into or with any other person, sell, lease or transfer all or a significant portion of our assets or capital stock to another person or enter into any other similar business combination transaction, or effect a liquidation;
- authorize, issue, sell, offer for sale or solicit offers to buy any shares of our common stock or any convertible securities or any other equity or debt securities or rights to acquire any of our or our subsidiaries' equity or debt securities, subject to certain exceptions, including among other things, the issuance under our stock incentive plan of grants that have been approved by our board of directors (or a board committee) and at least one director appointed by the New Mountain Entities;
- incur indebtedness or refinance any indebtedness, in each case in an amount in excess of a specified threshold;
- hire or replace our chief executive officer; or
- agree or otherwise commit to do any of the foregoing (unless the commitment is conditioned on obtaining the approval of the New Mountain Entities).

These approval rights of the New Mountain Entities will terminate following the closing of the offering when the New Mountain Entities and their respective assignees beneficially own either (i) less than 50% of the sum of (a) the number of shares of our common stock that they own immediately prior to the closing of this offering and (b) the number of shares of our common stock, if any, acquired following the closing of this offering (subject in each case to adjustment in the event of any stock split,

reverse stock split, stock dividend, recapitalization, combination of shares, reclassification or similar changes in our capitalization) or (ii) less than 15% of our common stock outstanding (as set forth on the cover of our then most recently filed annual report on Form 10-K or quarterly report on Form 10-Q). Following this offering, we expect the New Mountain Entities to hold        % of our outstanding common stock (or        % if the underwriters exercise in full their option to purchase additional shares from us).

## **Delaware Anti-Takeover Law and Certain Charter and Bylaw Provisions**

### ***Delaware Law***

We are subject to Section 203 of the Delaware General Corporation Law. Subject to certain exceptions, Section 203 prevents a publicly held Delaware corporation from engaging in a "business combination" with any "interested stockholder" for three years following the date that the person became an interested stockholder, unless either the interested stockholder attained such status with the approval of our board of directors, the business combination is approved by our board of directors and stockholders in a prescribed manner or the interested stockholder acquired at least 85% of our outstanding voting stock in the transaction in which it became an interested stockholder. A "business combination" includes, among other things, a merger or consolidation involving us and the "interested stockholder" and the sale of more than 10% of our assets. In general, an "interested stockholder" is any entity or person beneficially owning 15% or more of our outstanding voting stock and any entity or person affiliated with or controlling or controlled by such entity or person. The restrictions contained in Section 203 are not applicable to any of our existing stockholders that will own 15% or more of our outstanding voting stock upon the closing of this offering.

### ***Staggered Board; Removal of Directors***

Our certificate of incorporation and our bylaws divide our board of directors into three classes with staggered three-year terms. In addition, a director may be removed only for cause and only by the affirmative vote of the holders of at least 75% of the outstanding shares of our common stock. In addition, the authorized number of our directors may be changed only by resolution of our directors, and any vacancy on our board of directors, including a vacancy resulting from an enlargement of our board of directors, may be filled only by vote of a majority of our directors then in office.

The classification of our board of directors and the limitations on the ability of our stockholders to change the authorized number of directors, remove directors and fill vacancies could make it more difficult for a third party to acquire, or discourage a third party from seeking to acquire, control of our company.

### ***Stockholder Action; Special Meeting of Stockholders; Advance Notice Requirements for Stockholder Proposals and Director Nominations***

Our certificate of incorporation and our bylaws provide that any action required or permitted to be taken by our stockholders at an annual meeting or special meeting of stockholders may only be taken if it is properly brought before such meeting and may not be taken by written action in lieu of a meeting. Our certificate of incorporation and our bylaws also provide that, except as otherwise required by law, special meetings of the stockholders can only be called by the chairman of our board of directors, our chief executive officer or our board of directors. In addition, our bylaws establish an advance notice procedure for stockholder proposals to be brought before an annual meeting of stockholders, including proposed nominations of candidates for election to our board of directors. Stockholders at an annual meeting may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of our board of directors, or by a stockholder of record on the record date for the meeting, who is entitled to vote at the meeting and who has delivered timely

written notice in proper form to our secretary of the stockholder's intention to bring such business before the meeting. These provisions could have the effect of delaying until the next stockholder meeting stockholder actions that are favored by the holders of a majority of our outstanding voting securities. These provisions also could discourage a third party from making a tender offer for our common stock, because even if it acquired a majority of our outstanding voting stock, it would be able to take action as a stockholder, such as electing new directors or approving a merger, only at a duly called stockholder meeting and not by written consent.

### ***Super-Majority Voting***

The Delaware General Corporation Law provides generally that the affirmative vote of a majority of the shares entitled to vote on any matter is required to amend a corporation's certificate of incorporation or bylaws, unless a corporation's certificate of incorporation or bylaws, as the case may be, requires a greater percentage. Our bylaws may be amended or repealed by a majority vote of our board of directors or the affirmative vote of the holders of at least 75% of the votes that all our stockholders would be entitled to cast in any annual election of directors. In addition, the affirmative vote of the holders of at least 75% of the votes that all our stockholders would be entitled to cast in any election of directors is required to amend, repeal or adopt any provisions inconsistent with any of the provisions of our certificate of incorporation described above.

### **Registration Rights**

We intend to enter into a registration rights agreement with certain holders of our common stock, including our 5% stockholders and their affiliates and entities affiliated with our directors. Upon the completion of this offering, holders of a total of \_\_\_\_\_ shares of our common stock as of September 30, 2014, will have rights, subject to specified conditions, to require us to file registration statements covering their shares, or, along with holders of an additional \_\_\_\_\_ shares of our common stock, to include their shares in registration statements that we may file for ourselves or other stockholders. After registration pursuant to these rights, these shares will become freely tradable without restriction under the Securities Act of 1933, as amended, or the Securities Act.

### ***Demand Registration Rights***

At any time or from time to time, subject to specified limitations set forth in the registration rights agreement and to any lock-up period, the holders of 15% of the then outstanding shares having rights under the registration rights agreement, which we refer to as registrable shares, may at any time demand in writing that we register all or a portion of the registrable shares under the Securities Act if the total amount of registrable shares registered have an aggregate offering price of at least \$10.0 million (based on the then current market price or fair value), unless the registration is of the balance of the registrable shares held by the holders. We are not obligated to file a registration statement pursuant to this provision on more than two occasions, and we are not obligated to file a registration statement pursuant to this provision within 90 days of the effective date of any other registration statement that we may file.

### ***Form S-3 Registration Rights***

In addition, at any time after we become eligible to file a registration statement on Form S-3, subject to specified limitations set forth in the registration rights agreement, the holders of registrable shares may demand in writing that we register on Form S-3 all or a portion of the registrable shares so long as the total amount of registrable shares being registered have an aggregate offering price net of selling expenses of at least \$10.0 million (based on the then current market price), unless the registration is of the balance of the registrable shares held by the holders.

### ***Incidental Registration Rights***

If, at any time after the closing of this offering, we propose to file a registration statement under the Securities Act, other than pursuant to the demand registration rights described above, the holders of registrable shares will be entitled to notice of the registration and, subject to specified exceptions in the case of an underwritten offering, including market conditions, have the right to require us to register all or a portion of the registrable shares then held by them.

### ***Underwritten Public Offering***

In the event that any registration in which the holders of registrable shares participate pursuant to our registration rights agreement is an underwritten public offering, we agree to enter into an underwriting agreement containing customary representation and warranties and covenants, including without limitation customary provisions with respect to indemnification of the underwriters of such offering. Holders of registrable securities must agree to any such underwriting agreement as a condition to participation in the offering. If the total number of shares, including registrable shares, requested by holders to be included in such offering exceeds the largest number of shares to be sold (other than by us) that the underwriters believe can be sold in an orderly manner in such underwritten public offering, then we shall include shares in the offering pursuant to the priority guidelines set forth in the Registration Rights Agreement.

### ***Expenses and Indemnification***

Pursuant to the registration rights agreement, we are required to pay all registration expenses, including registration and filing fees, exchange listing fees, printing expenses and accounting fees and the fees and expenses of one counsel to represent the selling stockholders, other than any underwriting discounts and commissions, that are related to any demand or incidental registration described above. The registration rights agreement contains customary cross-indemnification provisions, pursuant to which we are obligated to indemnify the selling stockholders in the event of material misstatements or omissions in the registration statement attributable to us, and they are obligated to indemnify us for material misstatements or omissions in the registration statement attributable to them.

### ***Corporate Opportunity***

Our restated certificate of incorporation will provide that the doctrine of "corporate opportunity" will not apply to any of our stockholders or directors, other than any stockholder or director that is an employee of ours. Accordingly, our stockholders and directors (other than those that are employees of ours) and their respective representatives have no duty to communicate or present corporate opportunities to us and have the right to either hold any corporate opportunity for its (and its representatives') own account and benefit or to recommend, assign or otherwise transfer such corporate opportunity to persons other than us. As a result, our stockholders, directors and their respective affiliates will not be prohibited from investing in competing businesses or doing business with our customers.

### ***Transfer Agent and Registrar***

The transfer agent and registrar for our common stock will be \_\_\_\_\_.

### ***NASDAQ Global Market Listing***

We have applied to have our common stock listed on the NASDAQ Global Market under the symbol "BLPH."

## SHARES ELIGIBLE FOR FUTURE SALE

Prior to this offering, there has been no public market for our common stock, and a liquid trading market for our common stock may not develop or be sustained after this offering. Future sales of substantial amounts of our common stock in the public market, including shares issued upon exercise of outstanding options, or the anticipation of these sales, could adversely affect market prices prevailing from time to time and could impair our ability to raise capital through sales of equity securities.

Upon the closing of this offering, after giving effect to (1) the Corporate Conversion and (2) the conversion of all of our outstanding shares of non-voting common stock to shares of voting common stock, we will have outstanding                      shares of our common stock, after giving effect to the issuance of                      shares of our common stock in this offering, assuming no exercise by the underwriters of their option to purchase additional shares and no exercise of options outstanding as of                      .

Of the shares to be outstanding immediately after the closing of this offering, we expect that the                      shares to be sold in this offering will be freely tradable without restriction under the Securities Act unless purchased by our "affiliates," as that term is defined in Rule 144 under the Securities Act. The remaining                      shares of our common stock outstanding after this offering will be "restricted securities" under Rule 144, and we expect that substantially all of these restricted securities will be subject to the 180-day lock-up period under the lock-up agreements as described below. These restricted securities may be sold in the public market upon release or waiver of applicable lock-up agreements and only if registered or pursuant to an exemption from registration, such as Rule 144 or Rule 701 under the Securities Act. We expect the Rule 144 holding period requirements applicable to all of our outstanding shares of common stock will restart upon the Corporate Conversion.

### Rule 144

In general, under Rule 144, beginning 90 days after the date of this prospectus, any person who is not our affiliate and has held their shares for at least six months, including the holding period of any prior owner other than one of our affiliates, may sell shares without restriction, subject to the availability of current public information about us. In addition, under Rule 144, any person who is not our affiliate and has not been our affiliate at any time during the preceding three months and has held their shares for at least one year, including the holding period of any prior owner other than one of our affiliates, would be entitled to sell an unlimited number of shares immediately upon the closing of this offering without regard to whether current public information about us is available.

Beginning 90 days after the date of this prospectus, a person who is our affiliate or who was our affiliate at any time during the preceding three months and who has beneficially owned restricted shares of our common stock for at least six months, including the holding period of any prior owner other than one of our affiliates, is entitled to sell a number of shares within any three-month period that does not exceed the greater of:

- 1% of the number of shares of our common stock then outstanding, which will equal approximately                      shares immediately after this offering; and
- the average weekly trading volume of our common stock on the NASDAQ Global Market during the four calendar weeks preceding the filing of a Notice of Proposed Sale of Securities Pursuant to Rule 144 with respect to the sale.

Sales under Rule 144 by our affiliates are also subject to manner of sale provisions and notice requirements and to the availability of current public information about us.

## **Rule 701**

In general, under Rule 701 of the Securities Act, any of our employees, consultants or advisors, other than our affiliates, who purchased shares from us in connection with a qualified compensatory stock plan or other written agreement is eligible to resell these shares 90 days after the date of this prospectus in reliance on Rule 144, but without compliance with the holding period requirements of Rule 144 and without regard to the volume of such sales or the availability of public information about us. Subject to the 180-day lock-up period described below, approximately                shares of our common stock will be eligible for sale in accordance with Rule 701.

## **Lock-Up Agreements**

In connection with this offering, we, our directors, our executive officers and holders of our outstanding common stock, who collectively own        % of our common stock, based on shares outstanding as of September 30, 2014, have each agreed to enter into lock-up agreements and will be subject to a lock-up period, meaning that we and our permitted transferees will not be permitted to sell any of the shares of our common stock for 180 days after the date of this prospectus, subject to certain exceptions, without the prior written consent of Leerink Partners LLC and Cowen and Company, LLC on behalf of the several underwriters. The lock-up restrictions and specified exceptions are described in more detail under "Underwriting."

## **Registration Rights**

Upon the closing of this offering, the holders of 86,176,415 shares of our common stock as of September 30, 2014 or their transferees will be entitled to various rights with respect to the registration of these shares under the Securities Act. Registration of these shares under the Securities Act would result in these shares becoming fully tradable without restriction under the Securities Act immediately upon the effectiveness of the registration, except for shares purchased by affiliates. See "Description of Capital Stock—Registration Rights" for additional information. Shares covered by a registration statement will be eligible for sale in the public market upon the expiration or release from the terms of lock-up agreements applicable to such shares.

## **Stock Options**

As of September 30, 2014, we had outstanding options to purchase 13,754,598 shares of our common stock (as a result of the conversion of existing options to purchase limited liability company units into options to purchase shares of common stock pursuant to the Corporate Conversion), all of which options were vested. Following this offering, we intend to file one or more registration statements on Form S-8 under the Securities Act to register all of the shares of our common stock subject to outstanding options and options and other awards issuable pursuant to the public company incentive plan and our pre-IPO stock incentive plans. See "Executive Compensation—Stock Option and Other Compensation Plans" for additional information regarding these plans. Accordingly, shares of our common stock registered under the registration statements will be available for sale in the open market, subject to Rule 144 volume limitations applicable to affiliates, and subject to any vesting restrictions and lock-up agreements applicable to these shares.

## **MATERIAL U.S. FEDERAL TAX CONSIDERATIONS FOR NON-U.S. HOLDERS OF COMMON STOCK**

The following is a general discussion of material U.S. federal income and estate tax considerations relating to ownership and disposition of shares of our common stock issued pursuant to this offering by a non-U.S. holder. For purposes of this discussion, the term "non-U.S. holder" means a beneficial owner of our common stock that is not, for U.S. federal income tax purposes:

- an individual who is a citizen or resident of the United States;
- a corporation, or other entity treated as a corporation for U.S. federal income tax purposes, created or organized in or under the laws of the United States or of any political subdivision of the United States;
- an estate the income of which is subject to U.S. federal income taxation regardless of its source; or
- a trust if (1) a U.S. court is able to exercise primary supervision over the administration of the trust and one or more U.S. persons have authority to control all substantial decisions of the trust or (2) the trust has a valid election to be treated as a U.S. person under applicable U.S. Treasury Regulations.

This discussion does not address the tax treatment of partnerships or other entities that are pass-through entities for U.S. federal income tax purposes or persons that hold their common stock through partnerships or other pass-through entities. A partner in a partnership or other pass-through entity that will hold our common stock should consult his, her or its own tax advisor regarding the tax consequences of acquiring, holding and disposing of our common stock through a partnership or other pass-through entity, as applicable.

This discussion is based on current provisions of the U.S. Internal Revenue Code of 1986, as amended, which we refer to as the Code, existing and proposed U.S. Treasury Regulations promulgated thereunder, current administrative rulings and judicial decisions, all as in effect as of the date of this prospectus and all of which are subject to change or to differing interpretation, possibly with retroactive effect. Any change could alter the tax consequences to non-U.S. holders described in this prospectus. There can be no assurance that the Internal Revenue Service, or the IRS, will not challenge one or more of the tax consequences described in this prospectus. We assume in this discussion that a non-U.S. holder holds shares of our common stock as a capital asset, generally property held for investment.

This discussion does not address all aspects of U.S. federal income and estate taxation that may be relevant to a particular non-U.S. holder in light of that non-U.S. holder's individual circumstances nor does it address any aspects of U.S. state, local or non-U.S. taxes, the alternative minimum tax, or the Medicare tax on net investment income. This discussion also does not consider any specific facts or circumstances that may apply to a non-U.S. holder and does not address the special tax rules applicable to particular non-U.S. holders, such as:

- insurance companies;
- tax-exempt organizations;
- financial institutions;
- brokers or dealers in securities;
- regulated investment companies;
- pension plans;

- controlled foreign corporations;
- passive foreign investment companies;
- persons that have a functional currency other than the U.S. dollar;
- owners deemed to sell our common stock under the constructive sale provisions of the Code;
- owners that hold our common stock as part of a straddle, hedge, conversion transaction, synthetic security or other integrated investment; and
- certain U.S. expatriates.

**This discussion is for general information only and it is not tax advice. Accordingly, all prospective investors should consult their own tax advisors regarding the U.S. federal, state, local and non-U.S. tax consequences of the purchase, ownership and disposition of our common stock.**

#### **Distributions on Common Stock**

As discussed in the "Dividend Policy" section of this prospectus, we do not expect to pay dividends in the foreseeable future. If we pay distributions on our common stock, those distributions generally 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. If a distribution exceeds our current and accumulated earnings and profits, the excess will be treated as a tax-free return of the non-U.S. holder's investment, up to such holder's tax basis in the common stock. Any remaining excess will be treated as capital gain, subject to the tax treatment described below under the heading "Gain on Sale, Exchange or Other Disposition of Common Stock." Any such distributions will also be subject to the discussion below under the section titled "Withholding and information reporting requirements—FATCA."

Dividends paid to a non-U.S. holder generally will be subject to withholding of U.S. federal income tax at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence.

Dividends that are treated as effectively connected with a trade or business conducted by a non-U.S. holder within the United States, and, if an applicable income tax treaty so provides, that are attributable to a permanent establishment or a fixed base maintained by the non-U.S. holder within the United States, are generally exempt from the 30% withholding tax if the non-U.S. holder satisfies applicable certification and disclosure requirements. However, such U.S. effectively connected income, net of specified deductions and credits, is taxed at the same graduated U.S. federal income tax rates applicable to U.S. persons (as defined in the Code). Any U.S. effectively connected income received by a non-U.S. holder that is a corporation may also, under certain circumstances, be subject to an additional "branch profits tax" at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence.

A non-U.S. holder of our common stock who claims the benefit of an applicable income tax treaty between the United States and such holder's country of residence generally will be required to provide a properly executed IRS Form W-8BEN or W-8BEN-E (or successor form) and satisfy applicable certification and other requirements. Non-U.S. holders are urged to consult their own tax advisors regarding their entitlement to benefits under a relevant income tax treaty.

A non-U.S. holder that is eligible for a reduced rate of U.S. withholding tax under an income tax treaty may obtain a refund or credit of any excess amounts withheld by timely filing an appropriate claim with the IRS.



## **Gain on Sale, Exchange or Other Disposition of Common Stock**

A non-U.S. holder generally will not be subject to U.S. federal income tax on gain recognized on a sale, exchange or other disposition of shares of our common stock unless:

- the gain is effectively connected with the non-U.S. holder's conduct of a trade or business in the United States, and, if an applicable income tax treaty so provides, the gain is attributable to a permanent establishment or fixed-base maintained by the non-U.S. holder in the United States; in these cases, the non-U.S. holder will be taxed on a net income basis at the regular graduated rates and in the manner applicable to United States persons (as defined in the Code), and, if the non-U.S. holder is a foreign corporation, an additional branch profits tax at a rate of 30%, or a lower rate as may be specified by an applicable income tax treaty, may also apply;
- the non-U.S. holder is a non-resident alien individual who is present in the United States for 183 days or more in the taxable year of the disposition and certain other requirements are met, in which case the non-U.S. holder will be subject to a 30% tax (or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence) on the net gain derived from the disposition, which may be offset by certain U.S. source capital losses of the non-U.S. holder, if any (even though the individual is not considered a resident of the United States, provided that the non-U.S. holder has timely filed U.S. federal income tax returns with respect to such losses); or
- we are or have been, at any time during the five-year period preceding such disposition (or the non-U.S. holder's holding period, if shorter) a "U.S. real property holding corporation" unless our common stock is regularly traded on an established securities market and the non-U.S. holder held no more than 5% of our outstanding common stock, directly or indirectly, during the shorter of the 5-year period ending on the date of the disposition or the period that the non-U.S. holder held our common stock. Generally, a corporation is a "U.S. real property holding corporation" if the fair market value of its "U.S. real property interests" equals or exceeds 50% of the sum of the fair market value of its worldwide real property interests plus its other assets used or held for use in a trade or business. We believe that we are not currently, and we do not anticipate becoming, a "U.S. real property holding corporation" for U.S. federal income tax purposes. No assurance can be provided that our common stock will be regularly traded on an established securities market for purposes of the rules described above.

## **Information Reporting and Backup Withholding Tax**

We must report annually to the IRS and to each non-U.S. holder the gross amount of the distributions on our common stock paid to such holder and the tax withheld, if any, with respect to such distributions. Non-U.S. holders may have to comply with specific certification procedures to establish that the holder is not a U.S. person (as defined in the Code) in order to avoid backup withholding at the applicable rate, currently 28%, with respect to dividends on our common stock. Dividends paid to non-U.S. holders subject to withholding of U.S. federal income tax, as described above in "Distributions on Common Stock," generally will be exempt from U.S. backup withholding.

Information reporting and backup withholding generally will apply to the proceeds of a disposition of our common stock by a non-U.S. holder effected by or through the U.S. office of any broker, U.S. or foreign, unless the holder certifies its status as a non-U.S. holder and satisfies certain other requirements, or otherwise establishes an exemption. Generally, information reporting and backup withholding will not apply to a payment of disposition proceeds to a non-U.S. holder where the transaction is effected outside the United States through a non-U.S. office of a broker. However, for information reporting purposes, dispositions effected through a non-U.S. office of a broker with substantial U.S. ownership or operations generally will be treated in a manner similar to dispositions

effected through a U.S. office of a broker. Non-U.S. holders should consult their own tax advisors regarding the application of the information reporting and backup withholding rules to them.

Copies of information returns may be made available to the tax authorities of the country in which the non-U.S. holder resides or is incorporated under the provisions of a specific treaty or agreement.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules from a payment to a non-U.S. holder can be refunded or credited against the non-U.S. holder's U.S. federal income tax liability, if any, provided that an appropriate claim is timely filed with the IRS.

## **U.S. Federal Estate Tax**

Shares of our common stock owned or treated as owned by an individual who is not a citizen or resident of the United States (as specially defined for U.S. federal estate tax purposes) at the time of death are considered U.S. situs assets and will be included in the individual's gross estate for U.S. federal estate tax purposes and, therefore, may be subject to U.S. federal estate tax, unless an applicable estate tax or other treaty provides otherwise.

## **Withholding and Information Reporting Requirements—FATCA**

The Foreign Account Tax Compliance Act, or FATCA, generally imposes a U.S. federal withholding tax at a rate of 30% on payments of dividends on, and gross proceeds from the sale or other disposition of, our common stock if paid to a foreign entity unless (i) if the foreign entity is a "foreign financial institution," the foreign entity undertakes certain due diligence, reporting, withholding, and certain certification obligations, (ii) if the foreign entity is not a "foreign financial institution," the foreign entity identifies certain of its U.S. investors, if any, or (iii) the foreign entity is otherwise exempt under FATCA.

Under applicable U.S. Treasury Regulations, withholding under FATCA will only apply to payments of dividends on our common stock made after June 30, 2014 and to payments of gross proceeds from a sale or other disposition of our common stock made after December 31, 2016. Under certain circumstances, a non-U.S. holder may be eligible for refunds or credits of the tax. An intergovernmental agreement between the United States and an applicable foreign country may modify the requirements described in this paragraph. Non-U.S. holders should consult their own tax advisors regarding the possible implications of this legislation on their investment in our common stock and the entities through which they hold our common stock, including, without limitation, the process and deadlines for meeting the applicable requirements to prevent the imposition of the 30% withholding tax under FATCA.

**The preceding discussion of material U.S. federal tax considerations is for general information only. It is not tax advice. Prospective investors should consult their own tax advisors regarding the particular U.S. federal, state, local and non-U.S. tax consequences of purchasing, holding and disposing of our common stock, including the consequences of any proposed changes in applicable laws.**

## UNDERWRITING

Leerink Partners LLC and Cowen and Company, LLC are acting as representatives of the underwriters. Subject to the terms and conditions set forth in an underwriting agreement among us and the underwriters, we have agreed to sell to the underwriters, and each of the underwriters has agreed, severally and not jointly, to purchase from us, the number of shares of common stock set forth opposite its name below.

<u>Underwriter</u>	<u>Number of Shares</u>
Leerink Partners LLC	
Cowen and Company, LLC	
<b>Total</b>	

Subject to the terms and conditions set forth in the underwriting agreement, the underwriters have agreed, severally and not jointly, to purchase all of the shares sold under the underwriting agreement if any of these shares are purchased. If an underwriter defaults, the underwriting agreement provides that the purchase commitments of the non-defaulting underwriters may be increased or the underwriting agreement may be terminated.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act, or to contribute to payments the underwriters may be required to make in respect of those liabilities.

The underwriters are offering the shares, subject to prior sale, when, as and if issued to and accepted by them, subject to approval of legal matters by their counsel, including the validity of the shares, and other conditions contained in the underwriting agreement, such as the receipt by the underwriters of officers' certificates and legal opinions. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

### Commissions and Discounts

The representatives have advised us that the underwriters propose initially to offer the shares to the public at the public offering price set forth on the cover of this prospectus and to dealers at that price less a concession not in excess of \$            per share. After the initial offering, the public offering price, concession or any other term of the offering may be changed.

The following table shows the public offering price, underwriting discount and proceeds before expenses to us. The information assumes either no exercise or full exercise by the underwriters of their option to purchase additional shares of our common stock.

	<u>Per Share</u>	<u>Without Option</u>	<u>With Option</u>
Public offering price	\$	\$	\$
Underwriting discount	\$	\$	\$
Proceeds, before expenses, to us	\$	\$	\$

The expenses of the offering, not including the underwriting discount, are estimated at \$            million and are payable by us.

### Option to Purchase Additional Shares

We have granted an option to the underwriters, exercisable for 30 days after the date of this prospectus, to purchase up to            additional shares at the public offering price, less the underwriting discount. If the underwriters exercise this option, each will be obligated, subject to conditions contained in the underwriting agreement, to purchase a number of additional shares proportionate to that underwriter's initial amount reflected in the above table.

## **No Sales of Similar Securities**

We, our executive officers and directors and all of our other existing security holders have agreed not to sell or transfer any common stock or securities convertible into or exchangeable or exercisable for common stock, for 180 days after the date of this prospectus without first obtaining the written consent of the representatives. Specifically, we and these other persons have agreed, with certain limited exceptions, not to directly or indirectly:

- offer, pledge, sell or contract to sell any common stock;
- sell any option or contract to purchase any common stock;
- purchase any option or contract to sell any common stock;
- grant any option, right or warrant for the sale of any common stock;
- otherwise dispose of or transfer any common stock;
- request or demand that we file a registration statement related to the common stock; and
- enter into any swap or other agreement or any transaction that transfers, in whole or in part, the economic consequence of ownership of any common stock, whether any such swap, agreement or transaction is to be settled by delivery of shares or other securities, in cash or otherwise.

This lock-up provision applies to common stock and to securities convertible into or exchangeable or exercisable for common stock. It also applies to common stock owned now or acquired later by the person executing the agreement or for which the person executing the agreement later acquires the power of disposition.

## **NASDAQ Global Market Listing**

We have applied to have our common stock listed on the NASDAQ Global Market under the symbol "BLPH."

## **Determination of Offering Price**

Before this offering, there has been no public market for our common stock. The initial public offering price will be determined through negotiations between us and the representatives. In addition to prevailing market conditions, the factors to be considered in determining the initial public offering price are:

- the valuation multiples of publicly traded companies that the representatives believe to be comparable to us;
- our financial information;
- the history of, and the prospects for, our company and the industry in which we compete;
- an assessment of our management, its past and present operations, and the prospects for, and timing of, our future revenues;
- the present state of our development; and
- the above factors in relation to market values and various valuation measures of other companies engaged in activities similar to ours.

An active trading market for the shares may not develop. It is also possible that after the offering the shares will not trade in the public market at or above the initial public offering price.

The underwriters do not expect to sell more than 5% of the shares in the aggregate to accounts over which they exercise discretionary authority.

## **Price Stabilization, Short Positions and Penalty Bids**

Until the distribution of the shares is completed, SEC rules may limit underwriters and selling group members from bidding for and purchasing our common stock. However, the representatives may engage in transactions that stabilize the price of the common stock, such as bids or purchases to peg, fix or maintain that price.

In connection with the offering, the underwriters may purchase and sell our common stock in the open market. These transactions may include short sales, purchases on the open market to cover positions created by short sales and stabilizing transactions. Short sales involve the sale by the underwriters of a greater number of shares than they are required to purchase in the offering. "Covered" short sales are sales made in an amount not greater than the underwriters' option described above. The underwriters may close out any covered short position by either exercising their option or purchasing shares in the open market. In determining the source of shares to close out the covered short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared to the price at which they may purchase shares through the option granted to them. "Naked" short sales are sales in excess of such option. The underwriters must close out any naked short position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of our common stock in the open market after pricing that could adversely affect investors who purchase in the offering. Stabilizing transactions consist of various bids for or purchases of shares of common stock made by the underwriters in the open market prior to the closing of the offering.

The underwriters may also impose a penalty bid. This occurs when a particular underwriter repays to the underwriters a portion of the underwriting discount received by it because the representatives have repurchased shares sold by or for the account of such underwriter in stabilizing or short covering transactions.

Similar to other purchase transactions, the underwriters' purchases to cover the syndicate short sales may have the effect of raising or maintaining the market price of our common stock or preventing or retarding a decline in the market price of our common stock. As a result, the price of our common stock may be higher than the price that might otherwise exist in the open market. The underwriters may conduct these transactions on the NASDAQ Global Market, in the over-the-counter market or otherwise.

Neither we nor any of the underwriters make any representation or prediction as to the direction or magnitude of any effect that the transactions described above may have on the price of our common stock. In addition, neither we nor any of the underwriters make any representation that the representatives will engage in these transactions or that these transactions, once commenced, will not be discontinued without notice.

## **Electronic Distribution**

In connection with the offering, certain of the underwriters or securities dealers may distribute prospectuses by electronic means, such as e-mail.

## **Other Relationships**

Some of the underwriters and their affiliates may in the future engage in investment banking and other commercial dealings in the ordinary course of business with us or our affiliates. They may in the future receive customary fees and commissions for these transactions.

In addition, in the ordinary course of their business activities, the underwriters and their affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers. Such investments and securities activities may involve securities and/or

instruments of ours or our affiliates. The underwriters and their affiliates may also make investment recommendations and/or publish or express independent research views in respect of such securities or financial instruments and may hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

#### **Notice to Prospective Investors in the European Economic Area**

In relation to each Member State of the European Economic Area (each, a "Relevant Member State"), no offer of shares may be made to the public in that Relevant Member State other than:

- A. to any legal entity which is a qualified investor as defined in the Prospectus Directive;
- B. to fewer than 100 or, if the Relevant Member State has implemented the relevant provision of the 2010 PD Amending Directive, 150, natural or legal persons (other than qualified investors as defined in the Prospectus Directive), as permitted under the Prospectus Directive, subject to obtaining the prior consent of the representatives; or
- C. in any other circumstances falling within Article 3(2) of the Prospectus Directive, provided that no such offer of shares shall require the Company or the representatives to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive.

Each person in a Relevant Member State who initially acquires any shares or to whom any offer is made will be deemed to have represented, acknowledged and agreed that it is a "qualified investor" within the meaning of the law in that Relevant Member State implementing Article 2(1)(e) of the Prospectus Directive. In the case of any shares being offered to a financial intermediary as that term is used in Article 3(2) of the Prospectus Directive, each such financial intermediary will be deemed to have represented, acknowledged and agreed that the shares acquired by it in the offer have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an offer of any shares to the public other than their offer or resale in a Relevant Member State to qualified investors as so defined or in circumstances in which the prior consent of the representatives has been obtained to each such proposed offer or resale.

The Company, the representatives and their affiliates will rely upon the truth and accuracy of the foregoing representations, acknowledgements and agreements.

This prospectus has been prepared on the basis that any offer of shares in any Relevant Member State will be made pursuant to an exemption under the Prospectus Directive from the requirement to publish a prospectus for offers of shares. Accordingly, any person making or intending to make an offer in that Relevant Member State of shares which are the subject of the offering contemplated in this prospectus may only do so in circumstances in which no obligation arises for the Company or any of the underwriters to publish a prospectus pursuant to Article 3 of the Prospectus Directive in relation to such offer. Neither the Company nor the underwriters have authorized, nor do they authorize, the making of any offer of shares in circumstances in which an obligation arises for the Company or the underwriters to publish a prospectus for such offer.

For the purpose of the above provisions, the expression "an offer to the public" in relation to any shares in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the shares to be offered so as to enable an investor to decide to purchase or subscribe the shares, as the same may be varied in the Relevant Member State by any measure implementing the Prospectus Directive in the Relevant Member State and the expression "Prospectus Directive" means Directive 2003/71/EC (including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member States) and includes any relevant implementing measure in the Relevant Member State and the expression "2010 PD Amending Directive" means Directive 2010/73/EU.

## **LEGAL MATTERS**

The validity of the shares of our common stock offered hereby is being passed upon for us by Wilmer Cutler Pickering Hale and Dorr LLP. Goodwin Procter LLP is acting as counsel for the underwriters in connection with this offering.

## **EXPERTS**

The financial statements of Bellerophon Therapeutics LLC as of December 31, 2013 and 2012, and for the years ended December 31, 2013 and 2012 and for the period from August 26, 2009 (inception) to December 31, 2013, have been included herein and in the registration statement in reliance upon the report of KPMG LLP, independent registered public accounting firm, appearing elsewhere herein, and upon the authority of said firm 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 under the Securities Act with respect to the shares of our common stock we are offering to sell. This prospectus, which constitutes part of the registration statement, does not include all of the information contained in the registration statement and the exhibits, schedules and amendments to the registration statement. For further information with respect to us and our common stock, we refer you to the registration statement and to the exhibits and schedules to the registration statement. Statements contained in this prospectus about the contents of any contract, agreement or other document are not necessarily complete, and, in each instance, we refer you to the copy of the contract, agreement or other document filed as an exhibit to the registration statement. Each of these statements is qualified in all respects by this reference to such contract, agreement or other document.

You may read and copy the registration statement of which this prospectus is a part at the SEC's public reference room, which is located at 100 F Street, N.E., Room 1580, Washington, DC 20549. You can request copies of the registration statement by writing to the SEC and paying a fee for the copying cost. Please call the SEC at 1-800-SEC-0330 for more information about the operation of the SEC's public reference room. In addition, the SEC maintains an Internet website, which is located at [www.sec.gov](http://www.sec.gov), that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC. You may access the registration statement of which this prospectus is a part at the SEC's Internet website. Upon completion of this offering, we will be subject to the information reporting requirements of the Exchange Act, and we will file reports, proxy statements and other information with the SEC.

Upon closing of this offering, we will be subject to the informational and periodic reporting requirements of the Exchange Act. We will fulfill our obligations with respect to such requirements by filing periodic reports and other information with the SEC. We intend to furnish our stockholders with annual reports containing consolidated financial statements certified by an independent registered public accounting firm. We also maintain a website at [www.bellerophon.com](http://www.bellerophon.com). The information contained in, or which can be accessed through, our website does not constitute a part of this prospectus.

**BELLEROPHON THERAPEUTICS LLC****Index to Financial Statements**

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**Report of Independent Registered Public Accounting Firm**

The Board of Directors  
Bellerophon Therapeutics LLC

We have audited the accompanying balance sheets of Bellerophon Therapeutics LLC, a development stage company (the "Company"), as of December 31, 2013 and 2012, and the related statements of operations and comprehensive loss, changes in invested equity (deficit), and cash flows for the years ended December 31, 2013 and 2012 and for the period from August 26, 2009 (inception) to December 31, 2013. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Bellerophon Therapeutics LLC, a development stage company, as of December 31, 2013 and 2012, and the results of its operations and its cash flows for the years ended December 31, 2013 and 2012, and for the period from August 26, 2009 (inception) to December 31, 2013, in conformity with U.S. generally accepted accounting principles.

/s/ KPMG LLP

Short Hills, New Jersey  
May 14, 2014

**BELLEROPHON THERAPEUTICS LLC**

**(A Development Stage Company)**

**Balance Sheets**

**(Amounts in thousands)**

	<u>December 31,</u> <u>2013</u>	<u>December 31,</u> <u>2012</u>
<b>Assets</b>		
Current assets:		
Cash and cash equivalents	\$ —	\$ —
Restricted cash	—	—
Prepaid expenses and other current assets	1,552	319
Total current assets	1,552	319
Restricted cash, non-current	—	—
Property, plant and equipment, net	2,084	1,703
Other assets	—	1,327
Total assets	<u>\$ 3,636</u>	<u>\$ 3,349</u>
<b>Liabilities and Invested Equity (Deficit)</b>		
Current liabilities:		
Accounts payable	\$ 1,368	\$ 1,487
Accrued research and development	7,591	6,634
Employee compensation and benefits	3,194	2,362
Other current liabilities	1,839	728
Total current liabilities	13,992	11,211
Allocated portion of Ikaria special dividend bonus payable	4,273	2,865
Other liabilities	1,108	389
Total liabilities	19,373	14,465
Commitments and contingencies (Note 13)		
Invested equity (deficit):		
Investment by Ikaria, Inc.	160,778	103,401
Deficit accumulated during the development stage	(176,515)	(114,517)
Total invested equity (deficit)	(15,737)	(11,116)
Total liabilities and invested (deficit)	<u>\$ 3,636</u>	<u>\$ 3,349</u>

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

**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Statements of Operations and Comprehensive Loss****(Amounts in thousands)**

	Year Ended December 31, 2013	Year Ended December 31, 2012	Period from August 26, 2009 (inception) to December 31, 2013
Operating expenses:			
Research and development	\$ 52,985	\$ 38,727	\$ 147,887
General and administrative	9,013	7,185	27,690
Other operating expense	—	315	938
Total operating expenses	(61,998)	(46,227)	(176,515)
Income tax benefit (expense)	—	—	—
Net loss and comprehensive loss	<u>\$ (61,998)</u>	<u>\$ (46,227)</u>	<u>\$ (176,515)</u>

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

**BELLEROPHON THERAPEUTICS LLC**

**(A Development Stage Company)**

**Statements of Changes in Invested Equity (Deficit)**

**(Amounts in thousands)**

	Investment by Ikaria, Inc.	Deficit Accumulated During the Development Stage	Total Invested Equity (Deficit)
<b>Balance at August 26, 2009 (inception)</b>	\$ —	\$ —	\$ —
Net loss	—	(17,279)	(17,279)
Investment by Ikaria, Inc., net	7,282	—	7,282
<b>Balance at December 31, 2009</b>	7,282	(17,279)	(9,997)
Net loss	—	(13,581)	(13,581)
Investment by Ikaria, Inc., net	22,087	—	22,087
<b>Balance at December 31, 2010</b>	29,369	(30,860)	(1,491)
Net loss	—	(37,430)	(37,430)
Investment by Ikaria, Inc., net	36,459	—	36,459
<b>Balance at December 31, 2011</b>	65,828	(68,290)	(2,462)
Net loss	—	(46,227)	(46,227)
Investment by Ikaria, Inc., net	37,573	—	37,573
<b>Balance at December 31, 2012</b>	103,401	(114,517)	(11,116)
Net loss	—	(61,998)	(61,998)
Investment by Ikaria, Inc., net	57,377	—	57,377
<b>Balance at December 31, 2013</b>	<u>\$ 160,778</u>	<u>\$ (176,515)</u>	<u>\$ (15,737)</u>

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

**BELLEROPHON THERAPEUTICS LLC**

**(A Development Stage Company)**

**Statements of Cash Flows**

**(Amounts in thousands)**

	<b>Year Ended December 31, 2013</b>	<b>Year Ended December 31, 2012</b>	<b>Period from August 26, 2009 (inception) to December 31, 2013</b>
Cash flows from operating activities:			
Net loss	\$ (61,998)	\$ (46,227)	\$ (176,515)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation	429	85	585
Stock-based compensation	1,721	1,449	4,447
Loss on disposal of property, plant and equipment, net	—	2,840	2,841
Other items	149	315	674
Changes in operating assets and liabilities:			
Decrease (increase) in other current assets and other assets	94	(11)	(1,866)
Increase in accounts payable, accrued research and development, and other current liabilities	1,655	5,346	12,153
Increase (decrease) in other liabilities	719	(21)	1,108
Net cash used in operating activities	<u>(57,231)</u>	<u>(36,224)</u>	<u>(156,573)</u>
Cash flows from investing activities:			
Capital expenditures	<u>(727)</u>	<u>(3,478)</u>	<u>(5,427)</u>
Net cash used in investing activities	<u>(727)</u>	<u>(3,478)</u>	<u>(5,427)</u>
Cash flows from financing activities:			
Cash contributions from Ikaria, Inc., net	57,958	39,702	162,000
Net cash provided by financing activities	<u>57,958</u>	<u>39,702</u>	<u>162,000</u>
Net increase in cash and cash equivalents	—	—	—
Cash and cash equivalents, at beginning of year	—	—	—
Cash and cash equivalents, at end of year	<u>\$ —</u>	<u>\$ —</u>	<u>\$ —</u>
Non-cash investing activities:			
Contribution of property, plant and equipment from Ikaria, Inc., net	83	—	83
Non-cash financing activities:			
Investment by Ikaria, Inc., net	<u>\$ (581)</u>	<u>\$ (2,129)</u>	<u>\$ (1,222)</u>

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

**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements****(1) Organization and Nature of the Business**

Bellerophon Therapeutics LLC, or the Company, is a clinical stage biotherapeutics company focused on developing innovative products at the intersection of drugs and devices that address significant unmet needs in the treatment of cardiopulmonary and cardiac diseases. During the periods presented in these financial statements, the Company was the research and development operating segment of Ikaria, Inc., or Ikaria. As of December 31, 2013, the Company had two wholly-owned subsidiaries, Bellerophon Pulse Technologies LLC (formerly known as Ikaria Pulse Technologies LLC), a Delaware limited liability company, and Bellerophon BCM LLC (formerly known as Ikaria BCM LLC), a Delaware limited liability company. In January 2014, the Company formed a new wholly-owned subsidiary, Bellerophon Services, Inc., a Delaware corporation. The Company is conducting Phase 2 clinical trials of its inhaled nitric oxide product candidates using its proprietary pulsatile technology, which are referred to as the INOpulse product candidates, for the treatment of pulmonary arterial hypertension, or PAH, and pulmonary hypertension associated with chronic obstructive pulmonary disease, or PH-COPD. In addition, the Company is conducting a clinical trial of bioabsorbable cardiac matrix, or BCM, its product candidate for the prevention of left ventricular remodeling following acute myocardial infarction, or AMI, commonly known as a heart attack, which is intended to prevent progression to congestive heart failure.

The Company's business is subject to significant risks and uncertainties including, but not limited to:

- The risk that the Company will not achieve success in its research and development efforts, including clinical trials conducted by it or its potential collaborative partners.
- The expectation that the Company will experience operating losses for the next several years.
- Decisions by regulatory authorities regarding whether and when to approve the Company's regulatory applications as well as their decisions regarding labeling and other matters which could affect the commercial potential of the Company's products or product candidates.
- The risk that the Company will fail to obtain adequate financing to meet its future capital and financing needs.
- The risk that key personnel will leave the Company and/or that the Company will be unable to recruit and retain senior level officers to manage its business.

During the third quarter of 2013 in conjunction with Ikaria's financing activities, Ikaria began reporting financial information for two operating segments: its research and development business and its commercial business. During the fourth quarter of 2013, Ikaria completed an internal reorganization of the assets and subsidiaries of its two operating segments. In connection with the internal reorganization, Ikaria formed the Company as a new wholly-owned subsidiary and transferred the research and development-related assets related to INOpulse for PAH and INOpulse for PH-COPD to the Company and/or its subsidiaries. See Note 14 —*Equity Adjustments, Bellerophon Spin-Out and Merger*.

On December 24, 2013, Ikaria and Madison Dearborn Partners, or MDP, entered into an agreement and plan of merger, under which MDP would acquire a majority ownership position in Ikaria and existing shareholders retained a minority ownership position in Ikaria through certain merger transactions, or the Merger. The Merger was preceded by the pro rata distribution, or

**BELLEROPHON THERAPEUTICS LLC**

**(A Development Stage Company)**

**Notes to Financial Statements (Continued)**

**(1) Organization and Nature of the Business (Continued)**

Spin-Out, of all of the outstanding units of the Company to existing Ikaria stockholders through a special dividend. The Merger and Spin-Out were completed on February 12, 2014. See Note 14—*Equity Adjustments, Bellerophon Spin-Out and Merger*.

**(2) Summary of Significant Accounting Policies**

As the Company has not yet earned any revenue from its operations, it considers itself a development stage company as defined under Financial Accounting Standards Board Accounting Standards Codification Topic 915, Development Stage Entities. Pursuant to Topic 915, the Company is required to provide certain additional disclosures regarding cumulative expenses, losses and cash flows, as well as other information, as applicable, from its date of inception. For purposes of the financial statements presented herein, the Company has used August 26, 2009, the date of the Company's license and commercialization agreement for BCM, as the effective inception date of the Company. There was no program-specific research and development activity conducted by Ikaria prior to August 26, 2009 included in the business of the Company.

**(a) Basis of Presentation**

The financial statements presented herein have been derived from the audited historical financial statements and accounting records of Ikaria. These financial statements include all costs that were directly attributable to the Company plus an allocated amount of Ikaria's general and administrative and certain research and development expenses.

Direct and indirect costs related to the Company for INOpulse for PAH, INOpulse for PH-COPD and BCM clinical programs have been allocated to the Company. All allocations were based on actual costs incurred. For purposes of allocating non-project specific expenses, each departmental head provided information as to the percentage of employee time incurred on behalf of the Company.

Allocations of general and administrative expenses by Ikaria to the Company include allocations of corporate management, finance, information technology, legal, human resources and other overhead expenses, based on an approximate pro-rata headcount of employees.

The Company's balance sheets include assets and liabilities that were specifically identified and those that were allocated by Ikaria to the Company based on an estimate of the benefit derived from the underlying asset or liability. Ikaria has historically used a centralized approach to cash management and financing of its operations. Cash funding for the Company has been accounted for as a capital contribution from Ikaria. See Note 3—*Liquidity*.

Management believes that the statements of operations include a reasonable allocation of costs and expenses incurred by Ikaria which benefited the Company. However, such amounts may not be indicative of the actual level of costs and expenses that would have been incurred by the Company if it had operated as an independent stand-alone company or of the costs and expenses expected to be incurred in the future. As such, the financial information herein may not necessarily reflect the financial position, results of operations and cash flows of the Company expected in the future or what it would have been had it been an independent stand-alone company during the periods presented.

**BELLEROPHON THERAPEUTICS LLC**  
**(A Development Stage Company)**  
**Notes to Financial Statements (Continued)**

**(2) Summary of Significant Accounting Policies (Continued)**

The financial statements have been prepared in accordance with generally accepted accounting principles in the United States, or GAAP. Intercompany transactions have been eliminated.

In addition to the allocation process outlined above, the preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts reported and disclosure of contingent assets and liabilities. Actual results could differ from those estimates.

**(b) Cash and Cash Equivalents**

The Company considers all highly liquid investments with an original maturity date of three months or less to be cash equivalents.

**(c) Property, Plant and Equipment**

Property, plant and equipment are recorded at acquisition cost, which for internally developed assets include labor, materials and overhead. Additions and improvements that increase the value or extend the life of an asset are capitalized. Repairs and maintenance costs are expensed as incurred.

Depreciation is computed using the straight-line method over the estimated useful lives described below:

<u>Asset description</u>	<u>Estimated useful life (years)</u>
Machinery, equipment and furniture	3 - 15

**(d) Impairment of Long-Lived Assets**

Long-lived assets, such as property, plant and equipment, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to estimated undiscounted expected future cash flows. If the carrying amount of an asset exceeds its estimated future cash flows, an impairment charge is recognized for the amount by which the carrying amount of the asset exceeds the fair value of the asset. Assets to be sold are no longer depreciated and are reclassified outside of property, plant and equipment at the lower of the carrying amount or fair value less costs to sell.

**(e) Stock-Based Compensation**

Stock-based compensation expense for the Company represents an allocation of Ikaria's stock-based compensation expense based on the allocation percentages of the Company's cost centers, which were determined based on specific identification or the proportionate percentage of employee time or headcount to the respective total Ikaria employee time or headcount.



**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements (Continued)****(2) Summary of Significant Accounting Policies (Continued)*****(f) Income Taxes***

During the periods presented in these financial statements, the Company did not file separate tax returns as the Company was included in the tax groupings of other Ikaria entities within the respective entity's tax jurisdiction. As such, the income tax provision included in these financial statements has been calculated using the separate return method, as if the Company filed a separate tax return in each of its respective tax jurisdictions. The income tax provision included in these carve-out financial statements reflects Ikaria's status as a C-corporation. Subsequent to the Spin-Out, and prior to the conversion of the Company from a limited liability company to a corporation, the Company will be taxed as a partnership.

For financial reporting purposes, the Company has historically recorded no tax expense or benefit due to its operating loss position. A valuation allowance has been established on net deferred tax assets because management believes that it is more likely than not that the Company's net deferred tax assets will not be realized.

Deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred tax assets and liabilities are measured using enacted tax rates in effect for the year in which those temporary differences are expected to be recovered or settled.

The Company recognizes the benefit of an uncertain tax position that it has taken or expects to take on income tax returns prepared under a separate return method if such tax position is more likely than not to be sustained on examination by the taxing authorities, based on the technical merits of the position. These tax benefits are measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate resolution. Unrecognized tax benefits related to net operating loss carryforwards or tax credit carryforwards are presented as a reduction to the related gross deferred tax assets. Unrecognized tax benefits for which a net operating loss carryforward or tax credit carryforward is not available are presented as a liability. A liability for unrecognized tax benefits is classified as non-current unless the liability is expected to be settled in cash within 12 months of the reporting date.

Certain deferred tax assets that arose as a result of Ikaria's past activities and resultant operating losses, such as federal and state net operating loss carryforwards, research and development credit carryforwards and acquired in-process research and development, do not constitute assets of the Company and continued to constitute assets of Ikaria subsequent to the date of the Spin-Out.

***(g) Research and Development Expense***

Research and development costs are expensed as incurred. These expenses include the costs of the Company's proprietary research and development efforts, as well as costs incurred in connection with certain licensing arrangements. Upfront and milestone payments made to third parties in connection with research and development collaborations are expensed as incurred up to the point of regulatory approval. Payments made to third parties upon or subsequent to regulatory approval are capitalized and amortized over the remaining useful life of the related product. The Company also expenses the cost of purchased technology and equipment in the period of purchase if it believes that the technology

**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements (Continued)****(2) Summary of Significant Accounting Policies (Continued)**

or equipment has not demonstrated technological feasibility and it does not have an alternative future use. Nonrefundable advance payments for goods or services that will be used or rendered for future research and development activities are deferred and are recognized as research and development expense as the related goods are delivered or the related services are performed.

**(h) Use of Estimates**

The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of costs and expenses during the reporting period, including accrued research expenses, share-based compensation, income taxes and impairment of long-lived assets. Actual results could differ from those estimates.

**(3) Liquidity**

In the course of its development activities, the Company has sustained operating losses and expects such losses to continue over the next several years. The Company's ultimate success depends on the outcome of its research and development activities. From August 26, 2009 (inception) to December 31, 2013, the Company's net losses were \$176.5 million. Management expects to incur additional losses in the future to conduct product research and development and recognizes the need to raise additional capital through the potential issuance of additional equity or borrowings or entering into strategic alliances with partner companies. However, if such financing is not available at adequate levels or strategic alliances with partner companies do not occur, the Company will need to reevaluate its plans.

In connection with the Spin-Out, \$80.0 million of cash was distributed to the Company. This cash is expected to be sufficient to satisfy the Company's operating cash needs for at least 12 months from December 31, 2013. At the time of the Spin-Out, \$18.5 million of the \$80.0 million cash held by the Company was deposited in escrow to guarantee payment of the monthly services fees payable by the Company to Ikaria in exchange for the services to be provided by Ikaria pursuant to the transition services agreement during the 24 months following the Spin-Out. The escrowed cash will be classified as restricted cash in periods subsequent to the Spin-Out. See Note 11—*Related-Party Transactions*.

**(4) Restructuring Charges**

In December 2011, Ikaria announced the planned closure of its Seattle-based facility. Charges allocated to the Company included \$0.6 million for facility lease obligations, which was recorded in other operating expense, \$0.2 million for the impairment of fixed assets and \$0.5 million for severance and related charges, which were recorded in research and development expense. Accrued severance and related charges were paid in 2012. Facility lease obligations extended through March 2014. In 2012, an additional \$0.3 million charge was recorded for the impairment of fixed assets related to the closure of the Seattle-based facility, which was recorded in other operating expense in the Statement of Operations and Comprehensive Loss.

**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements (Continued)****(5) Property, Plant and Equipment**

Property, plant and equipment and accumulated depreciation either specifically identified or allocated to the Company by Ikaria consists of the following (in thousands):

	December 31,	
	2013	2012
Machinery, equipment and furniture	\$ 2,943	\$ 1,859
Less accumulated depreciation	(859)	(156)
	<u>\$ 2,084</u>	<u>\$ 1,703</u>

During 2013, Ikaria transferred to the Company gross fixed assets of \$0.4 million with accumulated depreciation of \$0.3 million in connection with the move of certain assets from Seattle to New Jersey.

**(6) Other Current Liabilities**

Other current liabilities either specifically identified or allocated to the Company by Ikaria consist of the following accrued expenses (in thousands):

	December 31,	
	2013	2012
Allocated current portion of Ikaria special dividend bonus payable	\$ 1,839	\$ 713
Other accrued liabilities	—	15
Total	<u>\$ 1,839</u>	<u>\$ 728</u>

See Note 8—*Share-Based Compensation*, for a discussion of the Ikaria special dividend bonus payable.

**(7) Income Taxes**

During the periods presented in these financial statements, the Company did not file separate income tax returns, as the Company was included in the tax groupings of other Ikaria entities within the respective entity's tax jurisdictions. As such, the income tax provisions included in these financial statements have been calculated using the separate return method, as if the Company filed a separate tax return in each of its respective tax jurisdictions, although no tax expense or benefit has been recorded due to its operating loss position. The Company has been treated as a C-corporation, based on Ikaria's tax status, for purposes of these financial statements.

# BELLEROPHON THERAPEUTICS LLC

(A Development Stage Company)

## Notes to Financial Statements (Continued)

### (7) Income Taxes (Continued)

A reconciliation of the statutory federal income tax rate to the Company's effective tax rate for the years ended December 31, 2013 and 2012 is as follows:

	Year Ended December 31, 2013	Year Ended December 31, 2012
U.S. federal statutory rate	35.0%	35.0%
State and local taxes, net of federal tax effect	5.3%	5.2%
Research tax credits	5.0%	5.6%
Valuation allowance	(44.4)%	(44.6)%
Incentive stock options	(0.1)%	(0.2)%
Other	(0.8)%	(1.0)%
	<u>0.0%</u>	<u>0.0%</u>

Deferred taxes reflect the tax effects of the differences between the amounts recorded as assets and liabilities for financial reporting purposes and the comparable amounts recorded for income tax purposes. Significant components of the deferred tax assets (liabilities) at December 31, 2013 and 2012 are as follows (in thousands):

	December 31, 2013		December 31, 2012	
	Assets	(Liabilities)	Assets	(Liabilities)
Net operating loss carryforwards	\$ 62,295	\$ —	\$ 38,510	\$ —
Research tax credit carryforwards	9,615	—	5,511	—
Property, plant and equipment	—	(1,269)	—	(939)
Intangible assets	5,140	—	5,625	—
Accrued compensation	1,103	—	613	—
Other	28	—	141	—
Subtotal	78,181	(1,269)	50,400	(939)
Valuation allowance	(76,912)	—	(49,461)	—
Total deferred tax assets (liabilities)	<u>\$ 1,269</u>	<u>\$ (1,269)</u>	<u>\$ 939</u>	<u>\$ (939)</u>
Net deferred tax assets	<u>\$ 0</u>		<u>\$ 0</u>	

A valuation allowance is provided when it is more likely than not that some portion or all of the deferred tax assets will not be realized. As of December 31, 2013, management believed that it was more likely than not that the deferred tax assets would not be realized, based on future operations, consideration of tax strategies and the reversal of deferred tax liabilities. As of December 31, 2013 and 2012, the Company had gross deferred tax assets of \$78.2 million and \$50.4 million, respectively. The Company maintained a valuation allowance of \$76.9 million and \$49.5 million at December 31, 2013 and 2012, respectively.

As of December 31, 2013 and 2012, the Company had unrecognized tax benefits related to research tax credit carryforwards, which were reflected as an offset to the gross deferred tax asset.

**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements (Continued)****(8) Share-Based Compensation**

Ikaria's employees have received Ikaria share-based compensation awards, and therefore, the following disclosures pertain to share-based compensation and the Ikaria special dividend bonus payable that have been allocated to the Company related to Ikaria share-based awards. See Note 2(a)—*Summary of Significant Accounting Policies—Basis of Presentation*. Accordingly, the amounts presented are not necessarily indicative of future awards and do not necessarily reflect what the Company would have experienced as a stand-alone company for the periods presented.

*Ikaria Special Dividend Plan*

In October 2011, Ikaria approved dividend equivalent rights for options, restricted stock units, or RSUs, and other equity awards granted under its equity award plans. Pursuant to the special dividend plan, in the event that the Ikaria board declared a dividend, each employee of the Company who held equity awards was eligible to receive a cash payment equal to the amount of the dividend per share, multiplied by the number of equity awards outstanding. The payment was payable as of the declaration date for vested options. For unvested options and unvested RSUs, payment was due upon vesting. As of December 31, 2013, the allocated portion of the special dividend bonus payable was \$6.1 million of which \$1.8 million was reflected in other current liabilities and \$4.3 million was reflected in non-current liabilities. As of December 31, 2012, the allocated portion of the special dividend bonus payable was \$3.6 million of which \$0.7 million was reflected in other current liabilities and \$2.9 million was reflected in non-current liabilities.

*Stock Options*

Stock options are generally granted by Ikaria with an exercise price equal to the fair value of a share of non-voting common stock on the date of the grant. The fair value of the common stock has been determined by the board of directors after considering a broad range of factors, including, but not limited to, the rights, preferences and privileges of the redeemable convertible preferred stock relative to those of the Ikaria's common stock, Ikaria's operating and financial performance, the introduction of new products, the stage of development of Ikaria's product candidates and the likelihood of regulatory approval, Ikaria's revenue growth, the lack of an active public market for Ikaria's stock, industry information such as market growth and volume, the performance of similarly situated companies in Ikaria's industry, the execution of strategic and development agreements, and the likelihood of achieving a liquidity event, such as an initial public offering, given prevailing market conditions and the nature and history of Ikaria's business. Stock options have a contractual life of ten years and generally have a vesting term of four years. Ikaria issues previously unissued non-voting common stock upon the exercise of stock options.

Compensation expense for stock options granted to employees and directors is based on the estimated grant date fair value of options and is recognized by Ikaria over the requisite service period on a straight-line expense attribution method.

**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements (Continued)****(8) Share-Based Compensation (Continued)***Valuation Assumptions for Stock Options*

The weighted average grant date fair value of stock options granted to employees and directors of Ikaria and the weighted average assumptions used by Ikaria to estimate the grant date fair value of the options using the Black-Scholes-Merton option pricing model were:

	2013	2012
Weighted average grant date fair value	\$1.95	\$2.40
Valuation assumptions:		
Risk-free rate	0.90%	0.83%
Expected volatility	46.5%	47.6%
Expected term	5.00 yrs	5.00 yrs
Dividend yield	—	—

Because Ikaria is not publicly traded and has limited operating history, the expected volatility is based on the median historic volatility for publicly traded industry peers. In addition, Ikaria has minimal historical information to develop expectations about future exercise patterns for its stock option grants. As a result, the expected term is based on an average of the expected term of options granted by Ikaria's publicly traded industry peers. The risk-free interest rate is based on the implied yield on U.S. Treasury zero coupon bonds for periods commensurate with the expected term of the options. The dividend yield on Ikaria's common stock is zero which is consistent with offering dividend equivalent rights for vested options and RSUs. Prior to the dividend equivalent rights program, Ikaria did not intend to pay dividends at the time of grant or during the expected term of its stock options.

*Restricted Stock Units*

Ikaria has granted RSUs to employees that generally vest over a four-year period. RSUs granted prior to January 1, 2011 vested 25% annually. RSUs granted on and after January 1, 2011 vest 25% on the second and third anniversary of the date of grant and 50% on the fourth anniversary of the date of grant. Shares of Ikaria non-voting common stock are delivered to the employee upon vesting, subject to payment of applicable withholding taxes, which may be paid in cash or an equivalent amount of shares withheld. Compensation expense for all RSUs is based on the grant date fair value of the RSU issued, which is based on the fair value of non-voting common stock. Ikaria recognizes compensation expense for RSUs on a straight-line basis over the requisite service period.

# BELLEROPHON THERAPEUTICS LLC

(A Development Stage Company)

## Notes to Financial Statements (Continued)

### (8) Share-Based Compensation (Continued)

#### *Stock-Based Compensation Expense, Net of Estimated Forfeitures*

The following table summarizes allocated stock-based compensation expense by statement of operations line item for the years ended December 31, 2013 and 2012 and for the period from August 26, 2009 (inception) through December 31, 2013 (in thousands):

	2013	2012	Period from August 26, 2009 (inception) through December 31, 2013
Research and development	\$ 1,120	\$ 882	\$ 2,795
General and administrative	601	567	1,652
Total expense	1,721	1,449	4,447
Tax benefit	(232)	(140)	(600)
Expense, net of tax benefit	<u>\$ 1,489</u>	<u>\$ 1,309</u>	<u>\$ 3,847</u>

#### *Long Term Incentive Plan*

In August 2012, under Ikaria's Long-Term Incentive Plan, or LTIP, Ikaria granted cash settled awards to its employees. The awards vest over four years, 25% on the second and third anniversary of the grant and 50% on the fourth anniversary of the grant, and are expensed over the requisite service period on a straight-line expense attribution method. The award value is tied to Ikaria's stock price and is adjusted at each reporting period to estimated fair value. Upon vesting, the awards will be settled in cash. The Company recognized a de minimis amount of allocated expense in 2013 and 2012 and the period from August 26, 2009 (inception) through December 31, 2013 for the LTIP.

### (9) Investment by Ikaria, Inc.

The Company's historical operating cash requirements have been provided by Ikaria. The balances in the investment by Ikaria account as of December 31, 2013 and 2012 of \$160.8 million and \$103.4 million, respectively, represent the investment by Ikaria in the Company, including cash funding as well as the impact of share-based compensation awards which increases equity and the Ikaria special dividend bonus payable allocated to the Company which decreases equity.

### (10) Product Acquisitions and Other Agreements

The Company has entered, and will consider entering, into agreements to develop and commercialize product candidates, which may include research and development, marketing and selling, manufacturing and distribution agreements. These agreements often require milestone and royalty or profit share payments, contingent upon the occurrence of certain future events linked to the success of the asset in development, as well as expense reimbursements. Costs incurred pursuant to these agreements are reported in their respective expense line items in the Statements of Operations.

**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements (Continued)****(10) Product Acquisitions and Other Agreements (Continued)***BioLineRx Ltd.*

On August 26, 2009, the Company entered into an agreement with BioLineRx Ltd. and BioLine Innovations Jerusalem L.P., which are referred to collectively as BioLine, under which the Company obtained the worldwide exclusive rights to BCM. The Company paid BioLine a \$7.0 million upfront payment in 2009 and a \$10.0 million milestone payment in 2010.

Under the terms of the license agreement, the Company is obligated to use commercially reasonable efforts to develop and commercialize at least one product containing BCM. Under the terms of the license agreement, if the Company achieves certain clinical and regulatory events specified in the license agreement, the Company will be obligated to pay milestone payments to BioLine that could total, in the aggregate, up to \$115.5 million, and if the Company achieves certain commercialization targets specified in the license agreement, the Company will be obligated to pay additional milestone payments to BioLine that could total, in the aggregate, up to \$150.0 million. In addition, the Company is obligated to pay BioLine a specified percentage of any upfront consideration it receives for sublicensing BCM, as well as royalties in the low double digits below 20% on net sales, if any, of any approved product containing BCM, subject to offsets for specified payments to third parties made in connection with BCM. The Company's obligation to pay BioLine royalties will expire on a product-by-product and country-by-country basis on the date on which BCM is no longer covered by a valid claim in the licensed patent rights in a given country.

BioLine has the option, exercisable under specified circumstances, to manufacture any product containing BCM for the Company pursuant to terms to be negotiated by the parties. If BioLine exercises this option, the Company would be obligated to purchase at least a specified percentage of its BCM requirements from BioLine at a price calculated using a pre-agreed methodology.

Except under specified circumstances, the Company may not directly or indirectly acquire more than a specified percentage of the equity or debt securities of BioLine, or urge, induce, entice or solicit any other party to acquire such securities.

The Company and BioLine have the right to terminate the license agreement for an uncured material breach by the other party. In addition, the Company has the right to terminate the license agreement if at any time the Company determines that further development of products containing BCM is not warranted. See Note 13—*Commitments and Contingencies*.

**(11) Related-Party Transactions**

In connection with the Spin-Out, in February 2014, the Company and Ikaria entered into a separation and distribution agreement which sets forth provisions relating to the separation of the Company's business from Ikaria's other businesses. The separation and distribution agreement described the assets and liabilities that remained with or were transferred to the Company and those that remained with or were transferred to Ikaria. The separation and distribution agreement provides for a full and complete release and discharge of all liabilities between Ikaria and the Company, except as expressly set forth in the agreement. The Company and Ikaria each agreed to indemnify, defend and hold harmless the other party and its subsidiaries, and each of their respective past and present directors, officers and employees, and each of their respective permitted successors and assigns, from any and all damages relating to, arising out of or resulting from, among other things, our business and certain additional specified liabilities or Ikaria's business and certain additional specified liabilities, as applicable.



**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements (Continued)****(11) Related-Party Transactions (Continued)**

In February 2014, the Company entered into a cross-license, technology transfer and regulatory matters agreement with a subsidiary of Ikaria. Pursuant to the terms of the license agreement, Ikaria granted to the Company a fully paid-up, non-royalty-bearing, exclusive license under specified intellectual property rights controlled by Ikaria to engage in the development, manufacture and commercialization of nitric oxide, devices to deliver nitric oxide and related services for or in connection with out-patient, chronic treatment of patients who have PAH, PH-COPD or idiopathic pulmonary fibrosis, or PH-IPF. Pursuant to the terms of the license agreement, the Company granted Ikaria a fully paid-up, non-royalty-bearing, exclusive license under specified intellectual property rights that the Company controls to engage in the development, manufacture and commercialization of products and services for or used in connection with the diagnosis, prevention or treatment, whether in- or out-patient, of certain conditions and diseases other than PAH, PH-COPD or PH-IPF and for the use of nitric oxide to treat or prevent conditions that are primarily managed in the hospital. The Company agreed that, during the term of the license agreement, it will not, without the prior written consent of Ikaria, grant a sublicense under any of the intellectual property licensed to the Company under the license agreement to any of its affiliates or any third party, in either case, that directly or indirectly competes with Ikaria's nitric oxide business.

In September 2013, October 2013 and February 2014, the Company and each of its subsidiaries entered into an agreement not to compete with a subsidiary of Ikaria, or, collectively, the agreements not to compete. Pursuant to the agreements not to compete, the Company and each of its subsidiaries agreed not to engage, anywhere in the world, in any manner, directly or indirectly, until the earlier of five years after the effective date of such agreement not to compete or the date on which Ikaria and all of its subsidiaries are no longer engaged in such business, in:

(1) the development, manufacture, commercialization, promotion, sale, import, export, servicing, repair, training, storage, distribution, transportation, licensing, or other handling or disposition of any product or service (including, without limitation, any product or service that utilizes, contains or includes nitric oxide for inhalation, a device intended to deliver nitric oxide or a service that delivers or supports the delivery of nitric oxide), bundled or unbundled, for or used in connection with (a) the diagnosis, prevention, or treatment, in both adult and/or pediatric populations, and whether in- or out-patient, of: (i) hypoxic respiratory failure associated with pulmonary hypertension, (ii) pulmonary hypertensive episodes and right heart failure associated with cardiovascular surgery, (iii) bronchopulmonary dysplasia, (iv) the management of ventilation—perfusion mismatch in acute lung injury, (v) the management of ventilation—perfusion mismatch in acute respiratory distress syndrome, (vi) the management of pulmonary hypertension episodes and right heart failure in congestive heart failure, (vii) pulmonary edema from high altitude sickness, (viii) the management of pulmonary hypertension episodes and right heart failure in pulmonary or cardiac surgery, (ix) the management of pulmonary hypertension episodes and right heart failure in organ transplant, (x) sickle cell vaso-occlusive crisis, (xi) hypoxia associated with pneumonia, or (xii) ischemia-reperfusion injury, or (b) the use of nitric oxide to treat or prevent conditions that are primarily managed in the hospital; or

(2) any and all development, manufacture, commercialization, promotion, sale, import, export, storage, distribution, transportation, licensing, or other handling or disposition of any terlipressin or any other product within the pressin family, (a) intended to treat (i) hepatorenal

**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements (Continued)****(11) Related-Party Transactions (Continued)**

syndrome in any form (HRS), (ii) bleeding esophageal varices, or (iii) septic shock, or (b) for or in connection with the management of low blood pressure.

In February 2014, the Company and Ikaria entered into a transition services agreement, pursuant to which Ikaria agreed to use commercially reasonable efforts to provide certain transition services to the Company for a two-year period, which services include management/executive, human resources, real estate, information technology, accounting, financial planning and analysis, legal, quality and regulatory support. Ikaria also has agreed to use reasonable efforts to provide the Company with the use of office space at Ikaria's headquarters in Hampton, New Jersey pursuant to the terms of the transition services agreement. In exchange for the services, beginning in February 2014, the Company is obligated to pay Ikaria monthly services fees in the amount of \$772,000 plus out of pocket expenses and certain other expenses. At the time of the Spin-Out, the Company deposited the sum of \$18.5 million, representing the aggregate of the \$772,000 monthly service fees payable by the Company under the transition services agreement, in escrow to guarantee payment of the monthly services fees by the Company. The escrowed cash will be classified as restricted cash in periods subsequent to the Spin-Out.

In February 2014, the Company entered into drug supply and device supply agreements with a subsidiary of Ikaria. Under these agreements, Ikaria has agreed to use commercially reasonable efforts to supply inhaled nitric oxide and nitric oxide delivery devices for use in the Company's clinical trials, in each case at Ikaria's manufacturing cost plus a 20% mark-up, and in the case of the drug supply agreement, the Company has agreed to purchase its clinical supply of inhaled nitric oxide from Ikaria. The Company also granted Ikaria a right of first negotiation in the event that the Company desires to enter into a commercial supply agreement with a third party for supply of nitric oxide for inhalation.

In February 2014, the Company and Ikaria entered into an employee matters agreement, pursuant to which the employment of certain Ikaria employees was transferred to the Company or its subsidiaries on the terms and conditions set forth in the employee matters agreement. Under the employee matters agreement, the Company agreed to assume and pay, perform, fulfill and discharge, in accordance with the terms of the employee matters agreement, all liabilities to or relating to such transferred employees.

**(12) Segments and Geographic Information**

The Company operates in one reportable segment and solely within the United States. Accordingly, no segment or geographic information has been presented.

**(13) Commitments and Contingencies*****Legal Proceedings***

The Company periodically becomes subject to legal proceedings and claims arising in connection with its business. The ultimate legal and financial liability of the Company in respect to all proceedings, claims and lawsuits, pending or threatened, cannot be estimated with any certainty.

BioLine has indicated to the Company that it believes that the Company has breached the license agreement in several ways, including, but not limited to, failure to use commercially reasonable efforts

**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements (Continued)****(13) Commitments and Contingencies (Continued)**

to develop BCM, failure to provide BioLine with material information concerning the development and commercialization plans for BCM and failure to notify BioLine in advance of material public disclosures regarding BCM. The Company and BioLine also disagree about the timing of a \$12.5 million milestone payment that the Company would owe BioLine based upon progress in the Company's BCM clinical development program. The Company believes it has complied with its obligations under the license agreement to use commercially reasonable efforts to develop BCM and is not currently in breach of its other obligations under the license agreement. Although the Company has had multiple discussions with BioLine on these issues, and these discussions are continuing, the Company has not been able to resolve these outstanding issues. If the Company is unable to reach agreement with BioLine on these issues, BioLine could bring a lawsuit against the Company, although any claims relating to the Company's alleged failure to use commercially reasonable efforts would first be subject to a non-binding 60-day mediation period with a third-party mediator. The Company believes that it would have strong defenses in any litigation that could be brought by BioLine. If BioLine were to prevail in any such litigation, one of the potential remedies would be the return of BCM to BioLine. No amounts have been accrued for this matter since no loss is probable as of December 31, 2013.

If BioLine were to prevail in any such litigation, or if the Company were required to pay the milestone in dispute sooner than planned, or if we were required to return BCM to BioLine, these events could have a material adverse effect on the Company's business, results of operations, financial condition and/or liquidity.

As of this report, other than as described above, there is no proceeding, claim or litigation, pending or threatened, that could, individually or in the aggregate, have a material adverse effect on the Company's business, operating results, financial condition and/or liquidity.

***Operating Lease***

The Company leases an operating facility located in North Brunswick, New Jersey under an operating lease arrangement. Future minimum rental commitments under the Company's non-cancellable operating lease in effect as of December 31, 2013 are as follows (in thousands):

2014	\$ 28
Thereafter	—
Total	<u>\$ 28</u>

The amounts in the table do not include (i) approximately \$100,000 of milestone rent payable upon the closing of an initial public offering by the Company or (ii) our rent obligation of \$113,400 through March 15, 2015, under a lease that the Company signed subsequent to December 31, 2013.

Rent expense, including direct and allocated expenses, is calculated on the straight-line basis and amounted to approximately \$0.5 million for each of the years ended December 31, 2013 and 2012.

**BELLEROPHON THERAPEUTICS LLC****(A Development Stage Company)****Notes to Financial Statements (Continued)****(14) Equity Adjustments, Bellerophon Spin-Out and Merger*****Equity Adjustments******Stock Options***

In February 2014, prior to the Spin-Out, each Ikaria stock option, other than options held by non-accredited investors who were also not employees of Ikaria, was adjusted such that it became an option to acquire the same number of shares of Ikaria non-voting common stock as were subject to the Ikaria stock option, or an Adjusted Ikaria Option, and an option to acquire the same number of non-voting limited liability company units of the Company as the number of shares of Ikaria non-voting common stock that were subject to the Ikaria stock option, or a Bellerophon Option. The exercise price of each option was adjusted by allocating the relative post Spin-Out estimated fair values of Ikaria and the Company in a ratio of 85% and 15%, respectively, reflecting the relative value of each entity. The expiration date of the options was not modified. In connection with the Spin-Out, each Adjusted Ikaria Option and each Bellerophon Option was fully accelerated.

***Restricted Stock Units***

In February 2014, prior to the Spin-Out, each Ikaria RSU was adjusted such that it became an RSU with respect to the same number of shares of Ikaria non-voting common stock as were subject to the Ikaria RSU, or an Adjusted Ikaria RSU, and an RSU with respect to the same number of non-voting limited liability company units of the Company as were subject to the Ikaria RSU. In connection with the Spin-Out, the vesting of each Adjusted Ikaria RSU and Bellerophon RSU was fully accelerated.

***Bellerophon Spin-Out***

On February 12, 2014, prior to the Merger, Ikaria distributed all of the Company's outstanding units to Ikaria's stockholders in a pro rata distribution through a special dividend. In the Spin-Out, each holder of Ikaria common stock received one voting limited liability company interest in the Company for each share of Ikaria common stock held. Following acceleration of the vesting of the Bellerophon RSUs, each Bellerophon RSU was settled through delivery of one non-voting limited liability company interest in the Company.

***Merger***

On February 12, 2014, through a series of merger subsidiary transactions, MDP acquired a majority ownership of Ikaria and Ikaria's existing shareholders retained a minority ownership position in Ikaria. In connection with the Merger, all amounts due under Ikaria's LTIP and special dividend bonus plan became vested and were settled in cash for \$11.1 million and \$34.7 million, respectively.

**(15) Subsequent Events**

The Company has evaluated events from the balance sheet date through May 14, 2014, the date at which the financial statements were available to be issued. There were no material subsequent events that required recognition or disclosure in these financial statements, except for the disclosures included in Note 1—*Organization and Nature of the Business*, Note 11—*Related-Party Transactions* and Note 14—*Equity Adjustments, Bellerophon Spin-Out and Merger*.

# BELLEROPHON THERAPEUTICS LLC

## Condensed Consolidated Balance Sheets

(Amounts in thousands)

	Unaudited Pro Forma September 30, 2014 (Note 11)	September 30, 2014 (unaudited)	December 31, 2013
<b>Assets</b>			
Current assets:			
Cash and cash equivalents	\$	30,605	\$ —
Restricted cash		9,264	—
Prepaid expenses and other current assets		1,571	1,552
Total current assets		41,440	1,552
Restricted cash, non-current		3,863	—
Deferred transaction costs		1,541	—
Property and equipment, net		1,790	2,084
Total assets	\$	48,634	\$ 3,636
<b>Liabilities and members' equity and invested equity (deficit)</b>			
Current liabilities:			
Accounts payable	\$	882	\$ 1,368
Accrued research and development		6,940	7,591
Employee compensation and benefits		5,081	3,194
Due to Ikaria, Inc.		631	—
Other current liabilities		—	1,839
Total current liabilities		13,534	13,992
Allocated portion of Ikaria special dividend payable		—	4,273
Other liabilities		—	1,108
Total liabilities		13,534	19,373
Commitments and contingencies (Note 9)			
Members' equity and invested equity (deficit):			
Members' equity		76,550	—
Invested deficit, net		—	(15,737)
Accumulated deficit		(41,450)	—
Total members' equity and invested equity (deficit)		35,100	(15,737)
<b>Total liabilities and members' equity and invested equity (deficit)</b>	\$	48,634	\$ 3,636

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

**BELLEROPHON THERAPEUTICS LLC****Condensed Consolidated Statements of Operations and Comprehensive Loss****(Unaudited)****(Amounts in thousands, except share and per share amounts)**

	Nine Months Ended September 30,	
	2014	2013
Operating expenses:		
Research and development	\$ 36,368	\$ 39,068
General and administrative	10,537	6,155
Total operating expenses	46,905	45,223
Income tax benefit (expense)	—	—
Net loss and comprehensive loss	<u>\$ (46,905)</u>	<u>\$ (45,223)</u>
Net loss per unit:		
Basic and diluted	<u>\$ (0.47)</u>	
Weighted average units outstanding:		
Basic and diluted	<u>98,930,615</u>	

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

**BELLEROPHON THERAPEUTICS LLC**

**Condensed Consolidated Statements of Changes in Members'  
Equity and Invested Equity (Deficit)**

(Unaudited)

(Amounts in thousands)

	Investment by Ikaria, Inc.	Accumulated deficit	Total invested equity (deficit)	Members' equity	Total members' equity
<b>Balance December 31, 2013</b>	<u>\$ 160,778</u>	<u>\$ (176,515)</u>	<u>\$ (15,737)</u>		
Net loss from January 1, 2014 through February 11, 2014, prior to Spin-Out	—	(5,455)	(5,455)		
Investment by Ikaria, Inc., net prior to Spin-Out	7,547	—	7,547		
Additional investment by Ikaria, Inc. for settlement of liabilities prior to Spin-Out	9,196	—	9,196		
<b>Balance, February 11, 2014</b>	<u>177,521</u>	<u>(181,970)</u>	<u>(4,449)</u>		
Contribution by Ikaria, Inc. of net assets to Bellerophon in connection with Spin-Out	(177,521)	181,970	4,449	\$ 75,551	\$ 75,551
Net loss from February 12, 2014 through September 30, 2014	—	(41,450)	—	—	(41,450)
Stock-based compensation	—	—	—	1,028	1,028
Repurchase of units	—	—	—	(29)	(29)
<b>Balance September 30, 2014</b>	<u>\$ —</u>	<u>\$ (41,450)</u>	<u>\$ —</u>	<u>\$ 76,550</u>	<u>\$ 35,100</u>

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

**BELLEROPHON THERAPEUTICS LLC**

**Condensed Consolidated Statements of Cash Flows**

(Unaudited)

(Amounts in thousands)

	Nine Months Ended September 30,	
	2014	2013
<b>Cash flows from operating activities:</b>		
Net loss	\$ (46,905)	\$ (45,223)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation	294	597
Other items	—	149
Stock-based compensation	1,299	1,463
Changes in operating assets and liabilities:		
(Increase) decrease in other current assets and other assets	(19)	23
Increase in restricted cash	(13,127)	—
Decrease in accounts payable, accrued research and development, and employee compensation and benefits	(344)	(1,651)
Increase (decrease) in amounts due to Ikaria, Inc.	631	(72)
Net cash used in operating activities	(58,171)	(44,714)
<b>Cash flows from investing activities:</b>		
Capital expenditures	—	(1,077)
Net cash used in investing activities	—	(1,077)
<b>Cash flows from financing activities:</b>		
Cash contribution from Ikaria, Inc. in connection with Spin-Out	80,000	—
Cash contributions from Ikaria, Inc., net	9,252	45,791
Transaction costs paid	(447)	—
Repurchase of units	(29)	—
Net cash provided by financing activities	88,776	45,791
Net change in cash and cash equivalents	30,605	—
Cash and cash equivalents at beginning of period	—	—
Cash and cash equivalents at end of period	<u>\$ 30,605</u>	<u>\$ —</u>
<b>Non-cash financing activities:</b>		
Investment by Ikaria, Inc., net	<u>\$ 7,491</u>	<u>\$ (1,987)</u>

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



**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements****(1) Organization, Nature of the Business and Management's Plans Regarding Financing of Future Operations**

Bellerophon Therapeutics LLC, or the Company, is a clinical-stage therapeutics company focused on developing innovative products at the intersection of drugs and devices that address significant unmet medical needs in the treatment of cardiopulmonary and cardiac diseases. The Company has two programs in advanced clinical development. The first program, INOpulse, is based on the Company's proprietary pulsatile nitric oxide delivery device. The Company is currently developing two product candidates under its INOpulse program: one for the treatment of pulmonary arterial hypertension, or PAH, for which the Company intends to commence Phase 3 clinical trials in the second half of 2015, and the other for the treatment of pulmonary hypertension associated with chronic obstructive pulmonary disease, or PH COPD, which is in Phase 2 development. The Company's second program is bioabsorbable cardiac matrix, or BCM, which is currently in a placebo-controlled clinical trial designed to support CE mark registration in the European Union. Enrollment of this trial is almost complete with more than 290 out of 306 patients enrolled, as of November 15, 2014. Assuming positive results from this trial, the Company intends to conduct a pivotal pre-market approval trial of BCM beginning in the first half of 2016, which will be designed to support registration in the United States. The Company is developing BCM for the prevention of cardiac remodeling, which often leads to congestive heart failure following an ST-segment elevated myocardial infarction, or STEMI.

The Company's business is subject to significant risks and uncertainties, including but not limited to:

- The risk that the Company will not achieve success in its research and development efforts, including clinical trials conducted by it or its potential collaborative partners.
- The expectation that the Company will experience operating losses for the next several years.
- Decisions by regulatory authorities regarding whether and when to approve the Company's regulatory applications as well as their decisions regarding labeling and other matters which could affect the commercial potential of the Company's products or product candidates.
- The risk that the Company will fail to obtain adequate financing to meet its future capital and financing needs.
- The risk that key personnel will leave the Company and/or that the Company will be unable to recruit and retain senior level officers to manage its business.

The Company was formerly the research and development operating segment of Ikaria Inc., or Ikaria. During the third quarter of 2013 in conjunction with Ikaria's financing activities, Ikaria began reporting financial information for two operating segments: its research and development business and its commercial business. During the fourth quarter of 2013, Ikaria completed an internal reorganization of the assets and subsidiaries of its two operating segments. In connection with the internal reorganization, Ikaria formed the Company as a new wholly-owned subsidiary and transferred the research and development-related assets related to INOpulse for PAH and INOpulse for PH-COPD to the Company and/or its subsidiaries.

On December 24, 2013, Ikaria and Madison Dearborn Partners, or MDP, entered into an agreement and plan of merger, under which MDP would acquire a majority ownership position in Ikaria and existing shareholders retained a minority ownership position in Ikaria through certain merger transactions, or the Merger.

**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(1) Organization, Nature of the Business and Management's Plans Regarding Financing of Future Operations (Continued)**

On February 12, 2014, prior to the Merger, Ikaria distributed all of the Company's outstanding units to Ikaria's stockholders in a pro rata distribution through a special dividend, which we refer to as the Spin-Out. In the Spin-Out, each holder of Ikaria common stock received one voting limited liability company interest in the Company for each share of Ikaria common stock held. There were 98,919,412 units outstanding as of September 30, 2014.

On February 12, 2014, through a series of merger subsidiary transactions, MDP acquired a majority ownership of Ikaria and Ikaria's existing shareholders retained a minority ownership position in Ikaria.

In connection with the Spin-Out, \$80.0 million of cash was distributed to the Company. At the time of the Spin-Out, \$18.5 million of the \$80.0 million cash held by the Company was deposited in escrow to guarantee payment of the monthly services fees payable by the Company to Ikaria in exchange for the services to be provided by Ikaria pursuant to the Company's transition services agreement with Ikaria, or the TSA, during the 24 months following the Spin-Out. At September 30, 2014, the escrowed cash balance was \$13.2 million and is classified as restricted cash on the condensed consolidated balance sheet at September 30, 2014, with \$9.3 million reflected as current and \$3.9 million reflected as non-current. See Note 7—*Related-Party Transactions*.

In the course of its development activities, the Company has sustained operating losses and expects such losses to continue over the next several years. As of September 30, 2014, the Company has an accumulated deficit of approximately \$41.5 million. The Company's ultimate success depends on the outcome of its research and development activities. Management expects to incur additional losses in the future to conduct product research and development and recognizes the need to raise additional capital through the potential issuance of additional equity or borrowings or entering into strategic alliances with partner companies. However, if such financing is not available at adequate levels or strategic alliances with partner companies do not occur, the Company will need to reevaluate its plans.

As of September 30, 2014, the Company has cash, cash equivalents and restricted cash of approximately \$43.7 million and expects that the \$43.7 million will fund its operating expenses and capital expenditure requirements through March 31, 2015. The Company's estimates and assumptions may prove to be wrong, and the Company may exhaust its capital resources sooner than expected. The process of testing product candidates in clinical trials is costly, and the timing of progress in clinical trials is uncertain. Because the product candidates are in clinical development and the outcome of these efforts is uncertain, the Company cannot estimate the actual amounts that will be necessary to successfully complete the development and commercialization of the product candidates or whether, or when, the Company may achieve profitability.

The inability to obtain additional financing could adversely affect the Company's short- and long-term ability to achieve its intended business objectives. These uncertainties raise substantial doubt as to the Company's ability to continue as a going concern. The financial statements do not include any adjustments that might be necessary if the Company were unable to continue as a going concern.

**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(2) Summary of Significant Accounting Policies*****(a) Basis of Presentation***

The accompanying unaudited condensed consolidated financial statements were prepared following the requirements of the Securities and Exchange Commission, or the SEC, for interim reporting. As permitted under those rules, certain footnotes or other financial information that are normally required by accounting principles generally accepted in the United States of America, or U.S. GAAP, can be condensed or omitted.

The Company is responsible for the unaudited condensed consolidated financial statements. The condensed consolidated financial statements include all normal and recurring adjustments that are considered necessary for the fair presentation of the Company's financial position at September 30, 2014 and its results of operations and its cash flows for the nine months ended September 30, 2014 and 2013. These condensed consolidated financial statements should be read in conjunction with the Company's audited financial statements for the year ended December 31, 2013. The results of operations for the period from January 1 to September 30, 2014 for the Company are not necessarily indicative of the results expected for the full year.

As discussed below, for periods prior to the Spin-Out, the financial statements were carved out of the consolidated financial statements of Ikaria. Although the financial statements prior to the Spin-Out were prepared on a combined carve-out basis, the financial statements for all periods presented have been labeled "consolidated" financial statements for ease of reference since the most recent balance sheet at September 30, 2014 is a consolidated balance sheet. At the date of the Spin-Out, the historical accumulated deficit of approximately \$182.0 million based on the carve-out financial statements through February 11, 2014 was eliminated in the transfer of net assets to the Company. The net loss for the period February 12, 2014 through September 30, 2014 of \$41.5 million has been reflected as the accumulated deficit on the September 30, 2014 condensed consolidated balance sheet, representing the net loss since the date of the Spin-Out. Net assets contributed to the Company in the Spin-Out were \$75.6 million, including cash of \$80.0 million. The results of operations and cash flows from February 12, 2014 through September 30, 2014 and the balance sheet as of September 30, 2014 represent actual results and the financial position of the Company on a stand-alone basis.

Management believes that the statements of operations for periods prior to the Spin-Out include a reasonable allocation of costs and expenses incurred by Ikaria which benefited the Company. However, such amounts may not be indicative of the actual level of costs and expenses that would have been incurred by the Company if it had operated as an independent stand-alone company or of the costs and expenses expected to be incurred in the future. As such, the financial information herein may not necessarily reflect the financial position, results of operations and cash flows of the Company expected in the future or what it would have been had it been an independent stand-alone company during the periods presented. The accompanying condensed consolidated financial statements include the accounts of the Company and its three wholly-owned subsidiaries. Intercompany transactions have been eliminated on consolidation.

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of costs and expenses during the reporting period, including accrued research and development expenses, stock-based compensation, income taxes and valuation of long-lived assets. Actual results could differ from those estimates.

**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(2) Summary of Significant Accounting Policies (Continued)**

Prior to February 12, 2014, the balance sheets, statements of operations and statements of cash flows were carved out of the consolidated financial statements of Ikaria and are, therefore, presented on a carve-out basis. The financial statements for periods prior to February 12, 2014 presented herein were derived from the historical financial statements and accounting records of Ikaria. These carve-out financial statements include all costs that were directly attributable to the Company plus an allocated amount of Ikaria's general and administrative and certain research and development expenses. These carve-out financial statements do not purport to reflect what the results of operations, comprehensive loss, financial position, equity (deficit) or cash flows would have been had the Company operated as a stand-alone company during the periods presented.

Direct and indirect costs related to the Company for INOpulse for PAH, INOpulse for PH-COPD and BCM clinical programs have been allocated to the Company for periods prior to February 12, 2014. These allocations were based on either a specific identification basis or, when specific identification is not practicable, proportional cost allocation methods, such as time and wage studies, depending on the nature of the expense. All allocations were based on actual costs incurred. For purposes of allocating non-project specific expenses, each departmental head provided information as to the percentage of employee time incurred on behalf of the Company.

Allocations of general and administrative expenses by Ikaria to the Company for periods prior to February 12, 2014 include allocations of corporate management, finance, information technology, legal, human resources and other overhead expenses, based on an approximate pro-rata headcount of employees.

The Company's balance sheet at December 31, 2013 includes assets and liabilities that were specifically identified and those that were allocated by Ikaria to the Company based on an estimate of the benefit derived from the underlying asset or liability. Ikaria has historically used a centralized approach to cash management and financing of its operations. Prior to the date of the Spin-Out, cash funding for the Company from Ikaria had been accounted for as a capital contribution from Ikaria.

**(b) Restricted Cash**

Restricted cash represents amounts held on deposit with a bank in relation to the TSA. The funds are held in an account to settle the required payment to Ikaria for services to be provided in connection with the TSA. The required payments to be paid in excess of one year from the balance sheet date are classified as long-term restricted cash. See Note 7—*Related-Party Transactions*.

**(c) Stock-Based Compensation**

The Company accounts for its stock-based compensation in accordance with Accounting Standards Codification 718, Compensation—Stock Compensation, which establishes accounting for stock-based awards exchanged for services and requires companies to expense the estimated fair value of these awards over the requisite service period. The Company recognizes stock-based compensation expense in operations based on the fair value of the award on the date of the grant. The resulting compensation expense is recognized on a straight-line basis over the requisite service period, generally four years or sooner if awards are immediately vested. The Company determines the fair value of stock options issued using a Black-Scholes-Merton option pricing model. Certain assumptions used in the model include expected volatility, dividend yield, risk-free interest rate and expected term. See Note 5—*Stock-Based Compensation* for a description of these assumptions.

**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(2) Summary of Significant Accounting Policies (Continued)**

Prior to the date of the Spin-Out, stock-based compensation expense for the Company represented an allocation of Ikaria's stock-based compensation expense based on the allocation percentages of the Company's cost centers, which were determined based on specific identification or the proportionate percentage of employee time or headcount to the respective total Ikaria employee time or headcount.

***(d) Deferred Transaction Costs***

Deferred transaction costs are costs related to the Company's initial public offering, which primarily consist of third-party professional legal, accounting and printing fees associated with the Company's registration statement. These initial public offering costs are deferred and charged against the gross proceeds of an offering when the public offering of equity securities is complete as a reduction of additional paid-in capital. Any deferred costs related to an unsuccessful public offering are expensed in the period in which the company elects to abort the public offering. The Company had deferred transaction costs of \$1.5 million as of September 30, 2014, of which \$0.4 million had been paid as of September 30, 2014.

***(e) New Accounting Pronouncements***

In May 2014, the Financial Accounting Standards Board, or FASB, issued Accounting Standards Update No. 2014-09, or ASU 2014-09, Revenue from Contracts with Customers (Topic 606). ASU 2014-09 supersedes the revenue recognition requirements in Accounting Standards Update No. 2009-13, Revenue Recognition (Topic 605) and requires entities to recognize revenue in a way that depicts the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled to in exchange for those goods or services. ASU 2014-09 is effective for annual reporting periods beginning after December 15, 2016, including interim periods within that reporting period, and is to be applied either retrospectively to each prior reporting period presented or retrospectively with the cumulative effect recognized at the date of initial application. Early application is not permitted. Although the Company does not generate revenues currently, management is in the process of evaluating the potential impact from the adoption of this guidance.

In June 2014, the FASB issued Accounting Standards Update No. 2014-10, or ASU 2014-10, Development Stage Entities (Topic 915): Elimination of Certain Financial Reporting Requirements, Including an Amendment to Variable Interest Entities Guidance in Topic 810, Consolidation. ASU 2014-10 eliminates the distinction of a development stage entity as well as certain related disclosure requirements, including the elimination of inception-to-date information on the statements of operations, members' equity and cash flows. For public business entities, the amendments in ASU 2014-10 are effective prospectively for annual reporting periods beginning after December 15, 2014, and interim periods within those annual periods, and for other entities, the amendments are effective for annual reporting periods beginning after December 15, 2014, and interim reporting periods beginning after December 15, 2015. Early application is permitted. The Company has adopted ASU 2014-10 for the reporting period ended September 30, 2014.

In June 2014, the FASB issued Accounting Standards Update No. 2014-12 "Compensation—Stock Compensation (Topic 718): Accounting for Share-Based Payments When the Terms of an Award Provide That a Performance Target Could Be Achieved after the Requisite Service Period," or ASU 2014-12. ASU 2014-12 clarifies the proper method of accounting for share-based payments when the terms of an award provide that a performance target could be achieved after the requisite service period. ASU 2014-12 requires that a performance target that affects vesting and that could be achieved

**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(2) Summary of Significant Accounting Policies (Continued)**

after the requisite service period be treated as a performance condition. The performance target should not be reflected in estimating the grant-date fair value of the award. Compensation cost should be recognized in the period in which it becomes probable that the performance target will be achieved and should represent the compensation cost attributable to the period(s) for which the requisite service has already been rendered. The amendments in ASU 2014-12 are effective for annual periods and interim periods within those annual periods beginning after December 15, 2015. Earlier adoption is permitted. The Company will adopt this guidance if and when share-based awards with performance targets are issued.

In August 2014, the FASB issued Accounting Standards Update No. 2014-15—"Presentation of Financial Statements—Going Concern (Subtopic 205-40): Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern," or ASU No. 2014-15. ASU No. 2014-15 should reduce diversity in the timing and content of footnote disclosures. ASU No. 2014-15 requires management to assess an entity's ability to continue as a going concern by incorporating and expanding upon certain principles that are currently in U.S. auditing standards. Specifically, it (1) provides a definition of the term substantial doubt, (2) requires an evaluation every reporting period including interim periods, (3) provides principles for considering the mitigating effect of management's plans, (4) requires certain disclosures when substantial doubt is alleviated as a result of consideration of management's plans, (5) requires an express statement and other disclosures when substantial doubt is not alleviated, and (6) requires an assessment for a period of one year after the date that the financial statements are issued (or available to be issued). The amendments in ASU No. 2014-15 are effective for the annual period ending after December 15, 2016, and for annual periods and interim periods thereafter. Early application is permitted. The Company is currently evaluating the impact the adoption of ASU No. 2014-15 will have on its financial statements.

**(3) Property, Plant and Equipment**

At the date of the Spin-Out, Ikaria transferred specifically identified assets to the Company at the carrying amount of the assets as of February 12, 2014. Prior to the date of the Spin-Out, property, plant and equipment and accumulated depreciation were either specifically identified or allocated to the Company by Ikaria. Property and equipment as of September 30, 2014 and December 31, 2013 consist of the following (in thousands):

	September 30, 2014 (Unaudited)	December 31, 2013
Machinery, equipment and furniture	\$ 2,943	\$ 2,943
Less accumulated depreciation	(1,153)	(859)
	<u>\$ 1,790</u>	<u>\$ 2,084</u>

**(4) Income Taxes**

On the date of the Spin-Out, the Company became a stand-alone limited liability company taxed as a partnership. Under this structure, the Company is not subject to income tax at the federal level, with the exception of its C-corporation subsidiary (see below), as its members are liable for the taxes on the Company's income or loss. The Company is subject to various taxes imposed within the states where it operates, however, currently those states do not have a partnership tax. Although the

**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(4) Income Taxes (Continued)**

Company is a limited liability company, one of its subsidiaries is a C-corporation that is subject to federal and state income taxes. The Company recorded no income tax expense for the period from February 12, 2014, the date of the Spin-Out, to September 30, 2014. The Company did not receive any deferred tax assets or liabilities as a result of the Spin-Out. Net operating losses are transferred to members as they are incurred.

Prior to the date of the Spin-Out, the Company did not file separate income tax returns, as the Company was included in the tax groupings of other Ikaria entities within the respective entity's tax jurisdictions. As such, the income tax provisions included in these financial statements for periods prior to the Spin-Out have been calculated using the separate return method, as if the Company filed a separate tax return in each of its respective tax jurisdictions, although no tax expense or benefit has been recorded due to its operating loss position. Prior to the date of the Spin-Out, the Company had been treated as a C-corporation, based on Ikaria's tax status, for purposes of its financial statements. Subsequent to the date of the Spin-Out, the Company is taxed as a partnership and does not record deferred tax assets or liabilities. Certain deferred tax assets that arose as a result of Ikaria's past activities and resultant operating losses, such as federal and state net operating loss carryforwards, research and development credit carryforwards and acquired in-process research and development, do not constitute assets of the Company as they were retained by Ikaria subsequent to the date of the Spin-Out.

As of September 30, 2014, there were no material uncertain tax positions. There are no tax positions for which a material change in any unrecognized tax benefit liability is reasonably possible in the next twelve months.

**(5) Stock-Based Compensation**

Determining the appropriate fair value of stock-based awards requires the input of subjective assumptions, including the fair value of the Company's units and for options, the expected life of the option and expected volatility. The Company uses the Black-Scholes-Merton option pricing model to value its stock option awards. The assumptions used in calculating the fair value of stock-based awards represent management's best estimates and involve inherent uncertainties and the application of management's judgment. As a result, if factors change and management uses different assumptions, stock-based compensation expense could be materially different for future awards. The expected life of stock options was estimated using the "simplified method," as the Company has no historical information to develop reasonable expectations about future exercise patterns and post-vesting employment termination behavior for its stock options grants. The simplified method is based on the average of the vesting tranches and the contractual life of each grant. For volatility, the Company uses comparable public companies as a basis for its expected volatility to calculate the fair value of options grants. The risk-free interest rate is based on U.S. Treasury notes with a term approximating the expected life of the option. The estimation of the number of stock awards that will ultimately vest requires judgment, and to the extent actual results or updated estimates differ from the Company's current estimates, such amounts will be recorded as an adjustment in the period in which estimates are revised.

***Bellerophon 2014 Equity Incentive Plan***

During the nine months ended September 30, 2014, the Company adopted the 2014 Equity Incentive Plan, or the Plan, which provides for the grant of options. The Company is authorized to

# **BELLEROPHON THERAPEUTICS LLC**

## **Notes to Unaudited Condensed Consolidated Financial Statements (Continued)**

### **(5) Stock-Based Compensation (Continued)**

issue options in an amount up to an aggregate of 7,000,000 non-voting units to eligible employees, directors and consultants, subject to the Board approval and amendments. The granted awards generally have a vesting period of four years, of which 25% of the awards vest on the second anniversary of grant date, 25% vest on the third anniversary and the remaining 50% vest on the fourth anniversary of the grant date.

During the period, the Company awarded a total of 6,441,718 options to its executives and employees to purchase the equivalent number of non-voting units with an exercise price of \$1.06 per unit. Options for non-voting units are granted to employees at exercise prices equal to the fair value of the Company's non-voting units based on an independent third party appraisal report. Approximately 1.1 million options granted were fully vested at the grant date, with the remaining options to vest over a four year period from the date of the Spin-Out. Compensation expense is measured based on the fair value of the option on the grant date and is recognized on a straight-line basis over the requisite service period, or sooner if vesting occurs sooner than on a straight-line basis. Options are forfeited if the employee ceases to be employed by the Company prior to vesting.

The following are the assumptions used in estimating the fair value of options issued during the nine months ended September 30, 2014.

	Nine Months Ended September 30, 2014
Valuation assumptions:	
Risk-free interest rate	1.71%
Expected volatility	90.00%
Expected term (in years)	6.1
Expected dividend yield	0.00%

The weighted average grant date fair value of options granted during the period subsequent to the date of the Spin-Out was \$0.79 per option.

A summary of option activity under the Plan for the nine months ended September 30, 2014 is presented below:

	<b>Bellerophon 2014 Equity Incentive Plan</b>			
	<b>Shares</b>	<b>Exercise Price</b>	<b>Weighted Average Exercise Price</b>	<b>Weighted Average Remaining Contractual Life (in years)</b>
Options outstanding as of February 12, 2014	—		—	
Granted	6,441,718	\$ 1.06	\$ 1.06	
Exercised	—			
Forfeited	(75,000)	1.06	1.06	
Options outstanding as of September 30, 2014	6,366,718	1.06	1.06	9.7
Options vested and exercisable as of September 30, 2014	1,128,343	\$ 1.06	\$ 1.06	9.7



**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(5) Stock-Based Compensation (Continued)**

As of September 30, 2014, there was approximately \$4.0 million of total unrecognized compensation expense related to non-vested options. This expense is expected to be recognized over a weighted-average period of approximately 3.7 years.

***Ikaria Equity Incentive Plans for Periods Prior to February 12, 2014***

The Company presented allocated stock-based compensation expenses from Ikaria for the period prior to February 12, 2014, the date of Spin-Out on its condensed consolidated statements of operations and comprehensive loss for the nine months ended September 30, 2014 and 2013. These allocated expenses are derived from Ikaria's historical financial statements. See Note 2(a)—*Summary of Significant Accounting Policies—Basis of Presentation*. The following disclosures for dates prior to the date of the Spin-Out pertain to stock-based compensation and the Ikaria special dividend bonus payable that were allocated to the Company related to Ikaria stock-based awards.

In February 2014, prior to the Spin-Out, each Ikaria stock option, other than options held by non-accredited investors who were also not employees of Ikaria, was adjusted such that it became an option to acquire the same number of shares of Ikaria non-voting common stock as were subject to the Ikaria stock option, or an Adjusted Ikaria Option, and an option to acquire the same number of non-voting limited liability company units of the Company as the number of share of Ikaria non-voting common stock that were subject to the Ikaria stock option, or a Bellerophon Option. There were 7,744,480 Bellerophon Options issued as a result of the adjustment of Ikaria stock options. Each Adjusted Ikaria Option and Bellerophon Option was fully accelerated on the date of the Spin-Out and all related compensation expense was recognized as an expense by Ikaria.

***Ikaria Special Dividend Plan***

In October 2011, Ikaria approved dividend equivalent rights for options, RSUs and other equity awards granted under its equity award plans. Pursuant to the special dividend plan, in the event that the Ikaria board declared a dividend, each employee of the Company who held equity awards was eligible to receive a cash payment equal to the amount of the dividend per share, multiplied by the number of equity awards outstanding. The payment was payable as of the declaration date for vested options. For unvested options and unvested RSUs, payment was due upon vesting. As of December 31, 2013, the Company's allocated portion of the special dividend bonus payable was \$6.1 million of which \$1.8 million was reflected in other current liabilities and \$4.3 million was reflected in non-current liabilities. The entire allocated portion of the special dividend bonus payable as of February 11, 2014 was settled in cash on the Company's behalf by Ikaria.

***Stock Options***

Prior to and in connection with the Spin-Out, the exercise price of each Adjusted Ikaria Option and Bellerophon Option was adjusted by allocating the relative post Spin-Out estimated fair values of Ikaria and the Company in a ratio of 85% and 15%, respectively, to the original Ikaria option exercise price. The expiration date of the options was not modified. The Company's allocable portion of Ikaria's stock-based compensation expense related to options for the period from January 1, 2014 through February 11, 2014 and the nine months ended September 30, 2013 was approximately \$0.1 million and \$0.4 million, respectively.

# **BELLEROPHON THERAPEUTICS LLC**

## **Notes to Unaudited Condensed Consolidated Financial Statements (Continued)**

### **(5) Stock-Based Compensation (Continued)**

There were 7,387,880 options outstanding resulting from the Adjusted Ikaria Options and Bellerophon Options as of September 30, 2014 at exercise prices ranging from \$0.02 to \$1.43 per unit. All options outstanding were fully vested at the time of the Spin-Out.

A summary of option activity related to the Bellerophon Options for the nine months ended September 30, 2014 is presented below:

	Ikaria Equity Incentive Plans for Periods Prior to February 12, 2014			Weighted Average Remaining Contractual Life (in years)
	Shares	Range of Exercise Price	Weighted Average Exercise Price	
Options issued and vested at date of Spin-Out as of February 12, 2014	7,744,480	\$ 0.02 - 1.43	\$ 0.58	
Granted	—			
Exercised	—			
Forfeited	(356,600)	0.62 - 0.86	0.77	
Options outstanding, vested and exercisable as of September 30, 2014	<u>7,387,880</u>	<u>\$ 0.02 - 1.43</u>	<u>\$ 0.57</u>	<u>4.9</u>

### *Restricted Stock Units*

In February 2014, prior to the Spin-Out, each Ikaria RSU was adjusted such that it became an RSU with respect to the same number of shares of Ikaria non-voting common stock as were subject to the Ikaria RSU, or an Adjusted Ikaria RSU, and an RSU with respect to the same number of non-voting limited liability company units of the Company as were subject to the Ikaria RSU, or a Bellerophon RSU. In connection with the Merger and the Spin-Out, the vesting of each Adjusted Ikaria RSU and Bellerophon RSU was fully accelerated. The compensation expense incurred upon the acceleration of the RSUs was recognized by Ikaria. Fully vested Bellerophon RSUs of 4,672,001 became Bellerophon non-voting units as of the date of the Spin-Out.

Ikaria had granted RSUs to employees that generally vested over a four-year period. RSUs granted prior to January 1, 2011 vested 25% annually. RSUs granted on and after January 1, 2011 vested 25% on the second and third anniversary of the date of grant and 50% on the fourth anniversary of the date of grant. Shares of Ikaria non-voting common stock were delivered to the employee upon vesting, subject to payment of applicable withholding taxes, which may be paid in cash or an equivalent amount of shares withheld. Compensation expense for all RSUs was based on the grant date fair value of the RSU issued, which was based on the fair value of common stock of Ikaria. Compensation expense for RSUs is recognized by Ikaria on a straight-line basis over the requisite service period. The RSU expense allocated from Ikaria totaled \$0.2 million for the period from January 1, 2014 through February 11, 2014 and \$1.1 million for the nine months ended September 30, 2013.

### *Stock-Based Compensation Expense, Net of Estimated Forfeitures*

The following table summarizes the stock-based compensation expense by the condensed consolidated statement of operations and comprehensive loss line item for the nine months ended

**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(5) Stock-Based Compensation (Continued)**

September 30, 2014 and 2013. For comparison purposes, the following disclosures include stock-based compensation expense recognized under the Plan and stock-based compensation expense for dates prior to the Spin-Out that were allocated to the Company related to Ikaria stock-based awards.

<u>(in thousands)</u>	<u>Nine Months Ended</u> <u>September 30,</u>	
	<u>2014</u>	<u>2013</u>
Research and development	\$ 271	\$ 1,015
General and administrative	1,028	448
Total expense	<u>1,299</u>	<u>1,463</u>

**(6) Investment by Ikaria, Inc.**

The Company's historical operating cash requirements prior to the date of the Spin-Out were provided by Ikaria. The balance in the investment by Ikaria account as of the date of the Spin-Out of \$177.5 million represented the investment by Ikaria in the Company, including cash funding as well as the impact of stock-based compensation awards, which increases equity, and the Ikaria special dividend bonus payable allocated to the Company, which decreases equity. This amount was eliminated with the transfer of net assets at the date of the Spin-Out.

**(7) Related-Party Transactions***Separation and Distribution Agreement*

In connection with the Spin-Out, in February 2014, the Company and Ikaria entered into a separation and distribution agreement which sets forth provisions relating to the separation of the Company's business from Ikaria's other businesses. The separation and distribution agreement described the assets and liabilities that remained with or were transferred to the Company and those that remained with or were transferred to Ikaria. The separation and distribution agreement provides for a full and complete release and discharge of all liabilities between Ikaria and the Company, except as expressly set forth in the agreement. The Company and Ikaria each agreed to indemnify, defend and hold harmless the other party and its subsidiaries, and each of their respective past and present directors, officers and employees, and each of their respective permitted successors and assigns, from any and all damages relating to, arising out of or resulting from, among other things, our business and certain additional specified liabilities or Ikaria's business and certain additional specified liabilities, as applicable.

*License Agreement*

In February 2014, the Company entered into a cross-license, technology transfer and regulatory matters agreement with a subsidiary of Ikaria. Pursuant to the terms of the license agreement, Ikaria granted to the Company a fully paid-up, non-royalty-bearing, exclusive license under specified intellectual property rights controlled by Ikaria to engage in the development, manufacture and commercialization of nitric oxide, devices to deliver nitric oxide and related services for or in connection with out-patient, chronic treatment of patients who have PAH, PH-COPD or idiopathic pulmonary fibrosis, or PH-IPF. Pursuant to the terms of the license agreement, the Company granted Ikaria a fully paid-up, non-royalty-bearing, exclusive license under specified intellectual property rights

**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(7) Related-Party Transactions (Continued)**

that the Company controls to engage in the development, manufacture and commercialization of products and services for or used in connection with the diagnosis, prevention or treatment, whether in- or out-patient, of certain conditions and diseases other than PAH, PH-COPD or PH-IPF and for the use of nitric oxide to treat or prevent conditions that are primarily managed in the hospital. The Company agreed that, during the term of the license agreement, it will not, without the prior written consent of Ikaria, grant a sublicense under any of the intellectual property licensed to the Company under the license agreement to any of its affiliates or any third party, in either case, that directly or indirectly competes with Ikaria's nitric oxide business.

*Agreements Not to Compete*

In September 2013, October 2013 and February 2014, the Company and each of its subsidiaries entered into an agreement not to compete with a subsidiary of Ikaria, or, collectively, the agreements not to compete. Pursuant to the agreements not to compete, the Company and each of its subsidiaries agreed not to engage, anywhere in the world, in any manner, directly or indirectly, until the earlier of five years after the effective date of such agreement not to compete or the date on which Ikaria and all of its subsidiaries are no longer engaged in such business, in:

- the development, manufacture, commercialization, promotion, sale, import, export, servicing, repair, training, storage, distribution, transportation, licensing, or other handling or disposition of any product or service (including, without limitation, any product or service that utilizes, contains or includes nitric oxide for inhalation, a device intended to deliver nitric oxide or a service that delivers or supports the delivery of nitric oxide), bundled or unbundled, for or used in connection with (a) the diagnosis, prevention, or treatment, in both adult and/or pediatric populations, and whether in- or out-patient, of: (i) hypoxic respiratory failure associated with pulmonary hypertension, (ii) pulmonary hypertensive episodes and right heart failure associated with cardiovascular surgery, (iii) bronchopulmonary dysplasia, (iv) the management of ventilation—perfusion mismatch in acute lung injury, (v) the management of ventilation—perfusion mismatch in acute respiratory distress syndrome, (vi) the management of pulmonary hypertension episodes and right heart failure in congestive heart failure, (vii) pulmonary edema from high altitude sickness, (viii) the management of pulmonary hypertension episodes and right heart failure in pulmonary or cardiac surgery, (ix) the management of pulmonary hypertension episodes and right heart failure in organ transplant, (x) sickle cell vaso-occlusive crisis, (xi) hypoxia associated with pneumonia, or (xii) ischemia-reperfusion injury, or (b) the use of nitric oxide to treat or prevent conditions that are primarily managed in the hospital; or
- any and all development, manufacture, commercialization, promotion, sale, import, export, storage, distribution, transportation, licensing, or other handling or disposition of any terlipressin or any other product within the pressin family, (a) intended to treat (i) hepatorenal syndrome in any form (HRS), (ii) bleeding esophageal varices or (iii) septic shock or (b) for or in connection with the management of low blood pressure.

*Transition Services Agreement*

In February 2014, the Company and Ikaria entered into the TSA, pursuant to which Ikaria agreed to use commercially reasonable efforts to provide certain transition services to the Company for a twenty-four month term, which services include management/executive, human resources, real estate, information technology, accounting, financial planning and analysis, legal, quality and regulatory

**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(7) Related-Party Transactions (Continued)**

support. Ikaria also has agreed to use reasonable efforts to provide the Company with the use of office space at Ikaria's headquarters in Hampton, New Jersey pursuant to the terms of the TSA. In exchange for the services, beginning in February 2014, the Company is obligated to pay Ikaria monthly services fees in the amount of \$772,000 plus out of pocket expenses and certain other expenses. At the time of the Spin-Out, the Company deposited the sum of \$18.5 million, representing the aggregate of the \$772,000 monthly service fees payable by the Company under the TSA, in escrow to guarantee payment of the monthly services fees by the Company. The escrowed cash is classified as restricted cash as of September 30, 2014. The Company recorded expenses of \$5.9 million from the date of the Spin-Out through September 30, 2014 in connection with the TSA. At September 30, 2014, the Company had accrued expenses due to Ikaria of \$0.5 million in connection with the TSA.

*Supply Agreements*

In February 2014, the Company entered into drug supply and device supply agreements with a subsidiary of Ikaria. Under these agreements, Ikaria has agreed to use commercially reasonable efforts to supply inhaled nitric oxide and nitric oxide delivery devices for use in the Company's clinical trials, in each case at Ikaria's manufacturing cost plus a 20% mark-up, and in the case of the drug supply agreement, the Company has agreed to purchase its clinical supply of inhaled nitric oxide from Ikaria. The Company also granted Ikaria a right of first negotiation in the event that the Company desires to enter into a commercial supply agreement with a third party for supply of nitric oxide for inhalation. The amount due to Ikaria under this agreement as of September 30, 2014 was approximately \$0.1 million.

**(8) Segments and Geographic Information**

The Company operates in one reportable segment and solely within the United States. Accordingly, no segment or geographic information has been presented.

**(9) Commitments and Contingencies***Legal Proceedings*

The Company periodically becomes subject to legal proceedings and claims arising in connection with its business. The ultimate legal and financial liability of the Company in respect to all proceedings, claims and lawsuits, pending or threatened, cannot be estimated with any certainty.

BioLine has indicated to the Company that it believes that the Company has breached the license agreement in several ways, including, but not limited to, failure to use commercially reasonable efforts to develop BCM, failure to provide BioLine with material information concerning the development and commercialization plans for BCM and failure to notify BioLine in advance of material public disclosures regarding BCM. The Company and BioLine also disagree about the timing of a \$12.5 million milestone payment that the Company would owe BioLine based upon progress in the Company's BCM clinical development program. The Company believes it has complied with its obligations under the license agreement to use commercially reasonable efforts to develop BCM and is not currently in breach of its other obligations under the license agreement. Although the Company has had multiple discussions with BioLine on these issues, and these discussions are continuing, the Company has not been able to resolve these outstanding issues. If the Company is unable to reach agreement with BioLine on these issues, BioLine could bring a lawsuit against the Company, although

**BELLEROPHON THERAPEUTICS LLC****Notes to Unaudited Condensed Consolidated Financial Statements (Continued)****(9) Commitments and Contingencies (Continued)**

any claims relating to the Company's alleged failure to use commercially reasonable efforts would first be subject to a non-binding 60-day mediation period with a third-party mediator. The Company believes that it would have strong defenses in any litigation that could be brought by BioLine. If BioLine were to prevail in any such litigation, one of the potential remedies would be the return of BCM to BioLine. No amounts have been accrued for this matter since no loss is probable as of September 30, 2014.

If BioLine were to prevail in any such litigation, or if the Company were required to pay the milestone in dispute sooner than planned, or if the Company were required to return BCM to BioLine, these events could have a material adverse effect on the Company's business, results of operations, financial condition and/or liquidity.

As of this report, other than as described above, there is no proceeding, claim or litigation, pending or threatened, that could, individually or in the aggregate, have a material adverse effect on the Company's business, operating results, financial condition and/or liquidity.

**(10) Net Loss Per Unit**

Basic net loss per unit is calculated by dividing net loss by the weighted average number of units outstanding during the period. Diluted net loss per unit is calculated by dividing net loss by the weighted average number of units outstanding, adjusted to reflect potentially dilutive securities (options) using the treasury stock method, except when the effect would be anti-dilutive. No net loss per unit information is presented for periods prior to the Spin-Out.

The weighted average units outstanding for basic and diluted net loss per unit for the nine months ended September 30, 2014 was 98,930,615, which represents the weighted average number of units outstanding for the period from February 12, 2014 through September 30, 2014.

The Company is reporting a net loss for the nine months ended September 30, 2014, therefore diluted net loss per unit is the same as the basic net loss per unit.

As of September 30, 2014, the Company had 13,754,598, options to purchase units outstanding that have been excluded from the computation of diluted weighted average units outstanding, because such securities had an antidilutive impact due to the loss reported.

**(11) Unaudited Pro Forma Balance Sheet**

The unaudited pro forma balance sheet gives effect to the following transactions, which are expected to occur in connection with the Company's initial public offering, as if they had occurred on September 30, 2014:

- (i) Conversion of all voting units to voting common stock
- (ii) Conversion of all non-voting units to non-voting common stock
- (iii) Conversion of the limited liability company to a C-corporation

**(12) Subsequent Events**

The Company has evaluated events from the balance sheet date through November 21, 2014, the date at which the financial statements were available to be issued. There were no material subsequent events that required recognition or disclosure in these unaudited condensed consolidated financial statements.

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Shares



Common Stock

**Leerink Partners**

**Cowen and Company**

, 2014

Until , (25 days after the date of this prospectus) all dealers that buy, sell or trade in our common stock, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to the dealers' obligation to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

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**Part II****INFORMATION NOT REQUIRED IN PROSPECTUS****Item 13. Other Expenses of Issuance and Distribution.**

The following table sets forth the expenses to be incurred in connection with the offering described in this registration statement, other than underwriting discounts and commissions, all of which will be paid by us. All amounts are estimates except the Securities and Exchange Commission's registration fee and the Financial Industry Regulatory Authority, Inc., or FINRA, filing fee and the NASDAQ Global Market listing fee.

	<b>Amount</b>
Securities and Exchange Commission registration fee	\$ *
FINRA filing fee	*
NASDAQ Global Market listing fee	*
Accountants' fees and expenses	*
Legal fees and expenses	*
Blue Sky fees and expenses	*
Transfer Agent's fees and expenses	*
Printing and engraving expenses	*
Miscellaneous fees and expenses	*
Total expenses	<u>\$ *</u>

\* To be filed by amendment.

**Item 14. Indemnification of Directors and Officers.**

Section 102 of the Delaware General Corporation Law permits a corporation to eliminate the personal liability of its directors or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his or her duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of Delaware corporate law or obtained an improper personal benefit. Our certificate of incorporation provides that no director shall be personally liable to us or our stockholders for monetary damages for any breach of fiduciary duty as a director, notwithstanding any provision of law imposing such liability, except to the extent that the Delaware General Corporation Law prohibits the elimination or limitation of liability of directors for breaches of fiduciary duty.

Section 145 of the Delaware General Corporation Law provides that a corporation has the power to indemnify a director, officer, employee, or agent of the corporation and certain other persons serving at the request of the corporation in related capacities against expenses (including attorneys' fees), judgments, fines and amounts paid in settlements actually and reasonably incurred by the person in connection with an action, suit or proceeding to which he or she is or is threatened to be made a party by reason of such position, if such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation, and, in any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful, except that, in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.



Upon completion of this offering, our certificate of incorporation provides that we will indemnify each person who was or is a party or threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of us) by reason of the fact that he or she is or was, or has agreed to become, our director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (all such persons being referred to as an "Indemnitee"), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding and any appeal therefrom, if such Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, and, with respect to any criminal action or proceeding, he or she had no reasonable cause to believe his or her conduct was unlawful. Our certificate of incorporation also provides that we will indemnify any Indemnitee who was or is a party to an action or suit by or in the right of us to procure a judgment in our favor by reason of the fact that the Indemnitee is or was, or has agreed to become, our director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise, or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees) and, to the extent permitted by law, amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding, and any appeal therefrom, if the Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, except that no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to us, unless a court determines that, despite such adjudication but in view of all of the circumstances, he or she is entitled to indemnification of such expenses. Notwithstanding the foregoing, to the extent that any Indemnitee has been successful, on the merits or otherwise, he or she will be indemnified by us against all expenses (including attorneys' fees) actually and reasonably incurred by him or her or on his or her behalf in connection therewith. If we do not assume the defense, expenses must be advanced to an Indemnitee under certain circumstances.

We intend to enter into indemnification agreements with our directors and executive officers prior to the closing of this offering. In general, these agreements will provide that we will indemnify the director or executive officer to the fullest extent permitted by law for claims arising in his or her capacity as a director or officer of our company or in connection with their service at our request for another corporation or entity. The indemnification agreements will also provide for procedures that will apply in the event that a director or executive officer makes a claim for indemnification and establish certain presumptions that are favorable to the director or executive officer.

We maintain a general liability insurance policy which covers certain liabilities of our directors and officers arising out of claims based on acts or omissions in their capacities as directors or officers.

The underwriting agreement we will enter into in connection with the offering of common stock being registered hereby provides that the underwriters will indemnify, under certain conditions, our directors and officers (as well as certain other persons) against certain liabilities arising in connection with such offering.

#### **Item 15. Recent Sales of Unregistered Securities.**

Except as set forth below, in the three years preceding the filing of this registration statement, we have not issued any securities that were not registered under the Securities Act of 1933, as amended, or the Securities Act.

On February 9, 2014, we, Ikaria, Inc., or Ikaria, and Ikaria Acquisition Inc. entered into a separation and distribution agreement which provided for and contained the key terms of our separation from Ikaria, which we refer to as the Spin-Out. Prior to the Spin-Out, we issued to certain employees and directors of ours or of our then parent company, Ikaria, and certain accredited investors, options to purchase an aggregate of 7,744,480 of our non-voting membership units, at a weighted average exercise price of \$0.58 per share. Between February 10, 2014 and November 20, 2014, we issued to certain employees options to purchase an aggregate of 6,441,718 of our non-voting membership units, at a weighted average exercise price of \$1.06 per unit of which as of November 20, 2014, no options to purchase shares of our common stock had been exercised, 75,000 options had been forfeited and options to purchase 6,366,718 shares of our common stock remained outstanding at a weighted average exercise price of \$1.06.

Prior to the Spin-Out, in February 2014, we issued to certain employees and directors of ours or of Ikaria and certain accredited investors restricted stock units in respect of an aggregate of 4,672,001 of our non-voting membership units, which we refer to as the Bellerophon RSUs. We subsequently settled such Bellerophon RSUs by issuing and delivering an aggregate of 4,672,001 non-voting membership units to the holders of Bellerophon RSUs.

Each of the foregoing issuances was made by us in a transaction not involving a public offering pursuant to an exemption from the registration requirements of the Securities Act in reliance upon Section 4(a)(2) of the Securities Act or Rule 701 promulgated under Section 3(b) of the Securities Act. We did not pay or give, directly or indirectly, any commission or other remuneration, including underwriting discounts or commissions, in connection with any of the issuances of securities listed above, and no underwriters were involved in the foregoing issuances of securities. All recipients either received adequate information about the registrant or had access, through employment or other relationships, to such information.

#### **Item 16. Exhibits and Financial Statement Schedules.**

The exhibits to the registration statement are listed in the Exhibit Index attached hereto and incorporated by reference herein.

#### **Item 17. Undertakings.**

- (a) The undersigned registrant hereby undertakes to provide to the underwriters at the closing specified in the underwriting agreement, certificates in such denominations and registered in such names as required by the underwriter to permit prompt delivery to each purchaser.
- (b) 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 Securities and Exchange Commission 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.
- (c) The undersigned registrant hereby undertakes that:
  - (1) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon

Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

- (2) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus 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.

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, in the Borough of Hampton, State of New Jersey, on this       day of       , 2014.

BELLEROPHON THERAPEUTICS LLC

By: \_\_\_\_\_  
Jonathan M. Peacock  
*Chairman, President and Chief Executive Officer*

SIGNATURES AND POWER OF ATTORNEY

We, the undersigned officers and directors of Bellerophon Therapeutics LLC, hereby severally constitute and appoint Jonathan M. Peacock, Manesh Naidu and David Abrams, and each of them singly (with full power to each of them to act alone), our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them for him and in his name, place and stead, and in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement (or any other registration statement for the same offering that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933), and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as full to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities held on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
_____ Jonathan M. Peacock	Chairman, President and Chief Executive Officer (principal executive officer)	
_____ David Abrams	Treasurer (principal financial and accounting officer)	
_____ Aldo E. Belloni, Ph.D.	Director	
_____ Matthew Holt	Director	

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<hr/> <div>Andre V. Moura</div>	Director	
<hr/> <div>Robert R. Nelsen</div>	Director	
<hr/> <div>Howard Pien</div>	Director	
<hr/> <div>Daniel Tassé</div>	Director	
<hr/> <div>Adam Weinstein</div>	Director	

## Exhibit Index

Exhibit Number	Description of Exhibit
1.1**	Underwriting Agreement
2.1**	Plan of Conversion
2.2**	Agreement and Plan of Merger
3.1**	Certificate of Incorporation of the Registrant (to be effective upon completion of the Registrant's conversion from a limited liability company to a corporation)
3.2**	Bylaws of the Registrant (to be effective upon completion of the Registrant's conversion from a limited liability company to a corporation)
3.3**	Form of Restated Certificate of Incorporation of the Registrant (to be effective upon the closing of this offering)
3.4**	Form of Amended and Restated Bylaws of the Registrant (to be effective upon the closing of this offering)
4.1**	Specimen Stock Certificate evidencing the shares of common stock
4.2**	Stockholders Agreement, dated                      , 2014
5.1**	Opinion of Wilmer Cutler Pickering Hale and Dorr LLP
10.1*	Assumed 2007 Ikaria Stock Option Plan
10.2*	Assumed 2010 Ikaria Long Term Incentive Plan
10.3*	2014 Equity Incentive Plan
10.4*	Form of Option Agreement under 2014 Equity Incentive Plan
10.5**	Public Company Stock Incentive Plan
10.6**	Form of Incentive Stock Option Agreement under Public Company Stock Incentive Plan
10.7**	Form of Nonstatutory Stock Option Agreement under Public Company Stock Incentive Plan
10.8*†	Amended and Restated License and Commercialization Agreement, dated as of August 26, 2009, among Ikaria Development Subsidiary One LLC, BioLineRx Ltd. and BioLine Innovations Jerusalem L.P., as amended
10.9*	Form of Agreement Not to Compete, entered into by Ikaria Acquisition LLC and each of the Registrant, Bellerophon BCM LLC, Bellerophon Pulse Technologies LLC and Bellerophon Services, Inc.
10.10*†	Separation and Distribution Agreement, dated as of February 9, 2014, among the Registrant, Ikaria, Inc. and Ikaria Acquisition LLC
10.11*†	Device Clinical Supply Agreement, dated as of February 9, 2014, between Bellerophon Pulse Technologies LLC and INO Therapeutics LLC
10.12*†	Drug Clinical Supply Agreement, dated as of February 9, 2014, between Bellerophon Pulse Technologies LLC and INO Therapeutics LLC
10.13*†	Employee Matters Agreement, dated as of February 9, 2014, between the Registrant and Ikaria, Inc.

Exhibit Number	Description of Exhibit
10.14*†	Exclusive Cross-License, Technology Transfer and Regulatory Matters Agreement, dated February 9, 2014, between Bellerophon Pulse Technologies LLC and INO Therapeutics LLC, as amended on March 27, 2014
10.15*†	Transition Services Agreement, dated as of February 9, 2014, between the Registrant and Ikaria, Inc.
10.16**	Registration Rights Agreement, dated as of February 12, 2014, among the Registrant, New Mountain Partners II (AIV-A), L.P., Allegheny New Mountain Partners, L.P., New Mountain Affiliated Investors II, L.P., IRDO Holding Corp., Venrock IK Holdings BT, Inc., Linde North America, Inc., 5AM-BT, Inc. and Aravis Venture I L.P.
10.17**	Form of Indemnification Agreement
10.18**	Assumed Employment Agreement, dated January 4, 2012, between Manesh Naidu and Ikaria, Inc.
10.19**	Assumed Employment Agreement, dated August 10, 2008, between Martin Meglasson and Ikaria, Inc.
10.20**	Assumed Employment Agreement, dated March 26, 2012, between Reinilde Heyrman and Ikaria, Inc.
10.21*	Form of Retention Bonus Letter for Executive Officers
10.22**	Employment Agreement, dated June 20, 2014, between Jonathan M. Peacock and the Registrant
21.1*	Subsidiaries of the Registrant
23.1**	Consent of KPMG LLP independent registered public accounting firm
23.2**	Consent of Wilmer Cutler Pickering Hale and Dorr LLP (included in Exhibit 5.1)
24.1**	Power of Attorney (included on signature page)
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*	Previously filed
**	To be filed by amendment
†	Confidential treatment requested as to portions of the exhibit. Confidential materials omitted and filed separately with the Securities and Exchange Commission.

