

Use these links to rapidly review the document

[TABLE OF CONTENTS](#)

[Table of Contents](#)

As filed with the Securities and Exchange Commission on June 29, 2016

Registration No. 333-211769

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

Pre-effective
Amendment No. 2
to

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

Onconova Therapeutics, Inc.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

2834
(Primary Standard Industrial
Classification Code Number)

22-3627252
(I.R.S. Employer
Identification No.)

Onconova Therapeutics, Inc.
375 Pheasant Run
Newtown, PA 18940
(267)-759-3680
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Ramesh Kumar, Ph.D.
President and Chief Executive Officer
Onconova Therapeutics, Inc.
375 Pheasant Run
Newtown, PA 18954
(267) 759-3680
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:
Jeffery P. Libson
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Princeton, NJ 08540-6227
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Approximate date of commencement of proposed sale to the public:
As soon as practicable after the effective date of this registration statement.

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

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

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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. (check one)

Large Accelerated filer

Accelerated filer

Non-accelerated filer
(Do not check if a
smaller reporting company)

Smaller reporting company

CALCULATION OF REGISTRATION FEE

Title of securities to be registered	Proposed maximum aggregate offering price(1)	Amount of registration fee(5)
Units, each consisting of one share of common stock, par value \$0.01 per share ("Common Stock") and 0.75 of a warrant ("Warrant") to purchase one share of Common Stock ("Units")	\$26,597,381	\$2,678
Non-transferable Rights to purchase Units(2)	—	—
Common Stock, par value \$0.01 per share included as part of the Units(3)	Included with Units above	—

Warrants included as part of the Units(3)	Included with Units above	—
Common Stock issuable upon exercise of the Warrants included in the Units(4)	\$23,937,643	\$2,411
Pre-Funded Warrants in lieu of Common Stock included in Units(3)	Included with Units Above	—
Common Stock issuable upon exercise of Pre-Funded Warrants(3)(4)	Included with Units Above	—
Total	\$50,535,024	\$5,089

- (1) Estimated solely for the purpose of calculating the registration fee in accordance with Rule 457(o) of the Securities Act of 1933 (the "Act").
- (2) Non-transferable Rights to subscribe for Units are being issued without consideration.
- (3) Pursuant to Rule 457(i) of and existing interpretations under the Act, no separate registration fee is required for the Common Stock and Warrants because the Common Stock and Warrants are being registered at the same time as the Units.
- (4) Pursuant to Rule 416 under the Securities Act, the shares being registered hereunder include such indeterminate number of shares as may be issuable with respect to the shares being registered hereunder as a result of stock splits, stock dividends or similar transactions.
- (5) \$2,266 was previously paid on June 1, 2016.

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

The information in this prospectus is not complete and may be changed. We may not sell these securities until the Securities and Exchange Commission declares our registration statement effective. This preliminary prospectus is not an offer to sell these securities and we are not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

Subject to completion, dated June 29, 2016

PRELIMINARY PROSPECTUS



Onconova Therapeutics, Inc.

We are distributing to holders of our common stock and to holders of certain of our outstanding warrants who are entitled to participate in this offering, at no charge, non-transferable subscription rights to purchase units. Each unit, which we refer to as a Unit, consists of one share of common stock and 0.75 of a tradable warrant representing the right to purchase one share of common stock, which we refer to as the Warrants. We refer to the offering that is the subject of this prospectus as the Rights Offering.

In the Rights Offering, you will receive 1.5 subscription rights for each share of common stock or each share of common stock underlying our participating warrants owned at 5:00 PM Eastern Time, on July 7, 2016, the record date of the Rights Offering, or the Record Date. The common stock and the Warrants comprising the Units will separate upon the effectiveness of the exercise of the rights and will be issued as separate securities, and the Units will not trade as a separate security. The subscription rights will not be tradable.

Each subscription right will entitle you to purchase one Unit, which we refer to as the Basic Subscription Right, at a subscription price per Unit to be determined, which we refer to as the Subscription Price. The Subscription Price per Unit is expected to be between \$5.75 and \$6.25. The exact Subscription Price per Unit will be determined by our board of directors or pricing committee prior to the effectiveness of the registration statement of which this prospectus is a part. The Warrants entitle the holder to purchase one share of common stock at an exercise price of \$ per share, 120% of the per Unit price, from the date of issuance through its expiration on , 2021. If you exercise your Basic Subscription Rights in full, and other shareholders or participating warrant holders do not, you will be entitled to an over-subscription privilege to purchase a portion of the unsubscribed Units at the Subscription Price, subject to proration, which we refer to as the Over-Subscription Privilege. Each subscription right consists of a Basic Subscription Right and an Over-Subscription Privilege, which we refer to as the Subscription Right.

For certain investors whose subscriptions may result in the purchaser beneficially owning more than 4.99% of our outstanding common stock, such investors may elect to receive in the Rights Offering, in lieu of shares of common stock, certain pre-funded warrants (which we refer to as the Pre-Funded Warrants) to purchase the same amount of shares of common stock. If you do not wish to exceed the ownership threshold, you may elect to receive a Pre-Funded Warrant in lieu of any share of common stock underlying the Units for which you have subscribed. You will not be eligible to elect to receive Pre-Funded Warrants, except to the extent that your beneficial ownership could exceed 4.99% of the shares of common stock outstanding following the consummation of the Rights Offering. Each Pre-Funded Warrant will have an exercise price of \$0.01, and the subscription price per Unit for any such electing investors will be reduced to \$ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a shareholder of the Company.

This prospectus also relates to the offering of the shares of common stock issuable upon exercise of these Pre-Funded Warrants.

The Subscription Rights will expire if they are not exercised by 5:00 PM Eastern Time, on July 26, 2016. We may extend the Rights Offering for additional periods in our sole discretion. Once made, all exercises of Subscription Rights are irrevocable.

The Rights Offering is being conducted on a best-efforts basis. There is no minimum amount of proceeds necessary in order for us to close the Rights Offering. While none of our directors or executive officers has entered into any binding commitment or agreement to exercise Subscription Rights received in the Rights Offering, our directors and executive officers have indicated interests in subscribing for up to an aggregate of \$3.0 million in the Rights Offering, subject to potential proration.

We have engaged Maxim Group LLC to act as dealer-manager in the Rights Offering.

Investing in our securities involves a high degree of risk. See the section entitled "Risk Factors" beginning on page 20 of this prospectus. You should carefully consider these risk factors, as well as the information contained in this prospectus, before you invest.

Wells Fargo Bank, N.A. will serve as the Subscription Agent for the Rights Offering. The Subscription Agent will hold the funds we receive from subscribers until we complete, abandon or terminate the Rights Offering. If you want to participate in this Rights Offering and you are the record holder of your shares or participating warrants, we recommend that you submit your subscription documents to the Subscription Agent well before the deadline. If you want to participate in this Rights Offering and you hold shares through your broker, dealer, bank, or other nominee, you should promptly contact your broker, dealer, bank, or other nominee and submit your subscription documents in accordance with the instructions and within the time period provided by your broker, dealer, bank, or other nominee. For a more detailed discussion, see "The Rights Offering—The Subscription Rights."

Our board of directors reserves the right to terminate the Rights Offering for any reason any time before the completion of the Rights Offering. If we terminate the Rights Offering, all subscription payments received will be returned as soon as practicable, without interest or penalty.

Our common stock is listed on the NASDAQ Capital Market, or NASDAQ, under the symbol "ONTX." On June 28, 2016, the last reported sale price of our common stock was \$6.00. We have applied to list the Warrants on NASDAQ following their issuance under the symbol "ONTXW." The Subscription Rights are non-transferable and will not be listed for trading on NASDAQ or any other stock exchange or market. You are urged to obtain a current price quote for our common stock before exercising your Subscription Rights.

	Per Unit	Total(2)
Subscription price	\$	\$
Dealer-Manager fees and expenses(1)	\$	\$
Proceeds to us, before expenses	\$	\$

(1) In connection with this Rights Offering, we have agreed to pay to the dealer-manager a cash fee equal to (a) 4.5% of the dollar amount of the Units sold to any holders of Subscription Rights who were beneficial owners of shares of our common stock prior to July 30, 2013, and (b) 8.0% of the dollar amount of the Units sold to any other holders of Subscription Rights. We will provide to the dealer-manager upon completion of the Rights Offering a non-accountable expense allowance equal to the lesser of \$100,000 or 3% of the gross proceeds of the Rights Offering for expenses incurred in connection with the Rights Offering. We advanced \$30,000 against out-of-pocket accountable expenses to Maxim Group LLC upon its engagement as a dealer-manager; provided that Maxim Group LLC will promptly reimburse to us (i) any portion of the advance not used for actual out-of-pocket expenses, if the Rights Offering is not completed, and (ii) the full amount of the advance, if the Rights Offering is completed. See "Plan of Distribution."

(2) Assumes the Rights Offering is fully subscribed, but excludes proceeds from the exercise of Warrants included within the Units.

Our board of directors is making no recommendation regarding your exercise of the Subscription Rights. You should carefully consider whether to exercise your Subscription Rights before the expiration date. You may not revoke or revise any exercises of Subscription Rights once made unless we terminate the Rights Offering.

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

Dealer-Manager

Maxim Group LLC

TABLE OF CONTENTS

	<u>Page</u>
QUESTIONS AND ANSWERS RELATING TO THE RIGHTS OFFERING	1
PROSPECTUS SUMMARY	9
SUMMARY CONSOLIDATED FINANCIAL DATA	14
SUMMARY OF THE RIGHTS OFFERING	16
RISK FACTORS	20
CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS	26
USE OF PROCEEDS	27
CAPITALIZATION	28
DILUTION	29
MARKET PRICE OF OUR COMMON STOCK AND RELATED STOCKHOLDER MATTERS	30
DIVIDEND POLICY	31
THE RIGHTS OFFERING	31
MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES	40
DESCRIPTION OF SECURITIES	48
PLAN OF DISTRIBUTION	53
EXPERTS	54
LEGAL MATTERS	54
WHERE YOU CAN FIND MORE INFORMATION	54
INCORPORATION BY REFERENCE	55

ABOUT THIS PROSPECTUS

Unless the context otherwise requires, references in this prospectus to "Onconova," "Onconova Therapeutics," "Company," "we," "us" and "our" refer to Onconova Therapeutics, Inc. and its consolidated subsidiaries. This prospectus is part of a registration statement that we have filed with the Securities and Exchange Commission, which we refer to as the SEC or the Commission, utilizing a registration process. It is important for you to read and consider all of the information contained in this prospectus and any applicable prospectus before making a decision whether to invest in the common stock. You should also read and consider the information contained in the exhibits filed with our registration statement, of which this prospectus is a part, as described in "Where You Can Find More Information" in this prospectus.

You should rely only on the information contained in this prospectus and any applicable prospectus supplement, including the information incorporated by reference. We have not authorized anyone to provide you with different information. We are not offering to sell or soliciting offers to buy, and will not sell, any securities in any jurisdiction where it is unlawful. You should assume that the information contained in this prospectus or any prospectus supplement, as well as information contained in a document that we have previously filed or in the future will file with the SEC is accurate only as of the date of this prospectus, the applicable prospectus supplement or the document containing that information, as the case may be.

QUESTIONS AND ANSWERS RELATING TO THE RIGHTS OFFERING

The following are examples of what we anticipate will be common questions about the Rights Offering. The answers are based on selected information included elsewhere in this prospectus. The following questions and answers do not contain all of the information that may be important to you and may not address all of the questions that you may have about the Rights Offering. This prospectus and the documents incorporated by reference into this prospectus contain more detailed descriptions of the terms and conditions of the Rights Offering and provide additional information about us and our business, including potential risks related to the Rights Offering, the Units offered hereby, and our business. We urge you to read this entire prospectus and the documents incorporated by reference into this prospectus.

Why are we conducting the Rights Offering?

We are conducting the Rights Offering to raise additional capital:

- to continue funding INSPIRE, our ongoing Phase 3 clinical trial of rigosertib IV in a population of patients with higher-risk myelodysplastic syndromes, or MDS, after failure of hypomethylating agent, or HMA, therapy, and
- for general corporate purposes, including working capital, research and development, business development and operational purposes.

What is the Rights Offering?

We are distributing, at no charge, to record holders of our common stock and to holders of certain of our outstanding warrants who are entitled to participate in this Rights Offering pursuant to the terms of such warrants, non-transferable Subscription Rights to purchase Units at a price per Unit expected to be between \$5.75 and \$6.25. The exact Subscription Price per Unit will be determined by our board of directors or pricing committee prior to the effectiveness of the registration statement of which this prospectus is a part. The Subscription Rights will not be tradable. Each Unit consists of one share of common stock and 0.75 of a Warrant representing the right to purchase one share of common stock at an exercise price of \$ per share, 120% of the per Unit price. Upon the effectiveness of the exercise of the Subscription Rights, the common stock and Warrants will immediately separate and will be issued as separate securities. We have applied to list the Warrants on NASDAQ under the symbol "ONTXW." You will receive 1.5 Subscription Rights for each share of common stock or each share of common stock underlying the participating warrants that you owned as of 5:00 PM Eastern Time, on the Record Date. Each Subscription Right entitles the record holder or holder of a participating warrant to a Basic Subscription Right and an Over-Subscription Privilege.

What are the Basic Subscription Rights?

For each whole share you owned or whole share underlying the participating warrants you owned as of the Record Date, you will receive 1.5 Basic Subscription Rights, each of which gives you the opportunity to purchase one share of our common stock and to receive 0.75 of a Warrant to purchase one additional share of our common stock for a price of \$ per Unit. For example, if you owned 100 shares of common stock as of the Record Date, you will receive 150 Subscription Rights and will have the right to purchase 150 shares of our common stock and 112 Warrants to purchase one additional share of our common stock for \$ per whole Unit (or a total payment of \$). You may exercise all or a portion of your Basic Subscription Rights or you may choose not to exercise any Basic Subscription Rights at all.

If you are a record holder or a holder of participating warrants, the number of shares you may purchase pursuant to your Basic Subscription Rights is indicated on the enclosed Subscription Rights Statement. If you hold your shares in the name of a broker, dealer, bank, or other nominee who uses

the services of the Depository Trust Company, or DTC, you will not receive a Subscription Rights Statement. Instead, DTC will issue 1.5 Subscription Rights to your nominee record holder for each share of our common stock that you own as of the Record Date. If you are not contacted by your nominee, you should contact your nominee as soon as possible.

What is the Over-Subscription Privilege?

If you exercise your Basic Subscription Rights in full, you may also choose to exercise your Over-Subscription Privilege to purchase a portion of any Units that the other record holders and participating warrant holders do not purchase through the exercise of their Basic Subscription Rights. You should indicate on your Subscription Rights Statement, or the form provided by your nominee if your shares are held in the name of a nominee, how many additional Units you would like to purchase pursuant to your Over-Subscription Privilege.

If sufficient Units are available, we will seek to honor your Over-Subscription request in full. If Over-Subscription requests exceed the number of Units available, however, we will allocate the available Units pro-rata among the record holders and participating warrant holders exercising the Over-Subscription Privilege in proportion to the number of shares of our common stock each of those record holders owned and the number of shares of our common stock underlying the participating warrants held by each of those warrant holders on the Record Date, relative to the number of shares owned and the number of shares underlying participating warrants held on the Record Date by all record holders and warrant holders exercising the Over-Subscription Privilege. If this pro-rata allocation results in any record holders or warrant holders receiving a greater number of Units than the record holder or warrant holder subscribed for pursuant to the exercise of the Over-Subscription Privilege, then such record holder or warrant holder will be allocated only that number of Units for which the record holder or warrant holder oversubscribed, and the remaining Units will be allocated among all other record holders and warrant holders exercising the Over-Subscription Privilege on the same pro rata basis described above. The proration process will be repeated until all Units have been allocated. See "The Rights Offering—Limitation on the Purchase of Units" for a description of certain limitations on purchase.

To properly exercise your Over-Subscription Privilege, you must deliver to the Subscription Agent the subscription payment related to your Over-Subscription Privilege before the Rights Offering expires. See "The Rights Offering—The Subscription Rights—Over-Subscription Privilege." To the extent you properly exercise your Over-Subscription Privilege for an amount of Units that exceeds the number of unsubscribed Units available to you, any excess subscription payments will be returned to you as soon as practicable after the expiration of the Rights Offering, without interest or penalty.

Wells Fargo Bank, N.A., our Subscription Agent for the Rights Offering, will determine the Over-Subscription allocation based on the formula described above.

What are the terms of the Warrants?

Each Warrant entitles the holder to purchase one share of common stock at an exercise price of \$ _____ per share, 120% of the per Unit price, from the date of issuance through its expiration on _____, 2021. The Warrants will be exercisable by paying the exercise price in cash, or, solely during any period when a registration statement for the exercise of the Warrants is not in effect, exercisable on a cashless basis. After the one-year anniversary of issuance, we may redeem the Warrants for \$0.001 per Warrant if the volume weighted average price of our common stock is above \$ _____ per share, 300% of the exercise price, for each of 10 consecutive trading days. Subject to certain exceptions, a holder may not exercise any portion of the Warrant to the extent that the holder would beneficially own more than 4.99% of the outstanding common stock after exercise.

What are the terms of the Pre-Funded Warrants?

The Pre-Funded Warrants will only be issued to certain investors whose subscriptions for Units in the Rights Offering may result in the purchaser beneficially owning more than 4.99% of our outstanding common stock following the consummation of the Rights Offering, and who elect to receive Pre-Funded Warrants in lieu of shares of common stock underlying the Units for which the investors have subscribed. You will not be eligible to elect to receive Pre-Funded Warrants, except to the extent that your beneficial ownership could exceed 4.99% of the shares of common stock outstanding following the consummation of the Rights Offering.

Each Pre-Funded Warrant entitles the holder to purchase one share of common stock at an exercise price of \$0.01 per share, and the subscription price per Unit for any such electing investors will be reduced to \$ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). Each Pre-Funded Warrant will be exercisable from the date of issuance through its expiration on , 2021. The Pre-Funded Warrants will be exercisable by paying the exercise price in cash or on a cashless basis in accordance with the terms of the Pre-Funded Warrants. The Pre-Funded Warrants will not be listed for trading on any stock exchange or market. The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a shareholder of the Company.

Will fractional shares be issued upon exercise of Subscription Rights or upon the exercise of Warrants?

No. We will not issue fractional shares of common stock in the Rights Offering. Rights holders will only be entitled to purchase a number of Units representing a whole number of shares of common stock, rounded down to the nearest whole number of Units a holder would otherwise be entitled to purchase. Any excess subscription payments received by the Subscription Agent will be returned as soon as practicable after expiration of the Rights Offering, without interest or penalty. Similarly, no fractional shares of common stock will be issued in connection with the exercise of a Warrant. If, upon exercise of a Warrant, the holder thereof would be entitled to receive a fractional share of common stock, upon exercise, the holder will only be entitled to receive a whole number of shares of common stock, rounded down to the nearest whole number.

What effect will the Rights Offering have on our outstanding common stock?

After our one-for-ten reverse stock split on May 31, 2016, 2,740,212 shares of our common stock were outstanding, along with participating warrants to purchase 96,842 shares of common stock. Based on the foregoing, and assuming no other transactions by us involving our common stock prior to the expiration of the Rights Offering, if the Rights Offering is fully subscribed, approximately 6,995,793 shares of our common stock will be issued and outstanding and Warrants to purchase approximately 3,191,686 additional shares of our common stock will be outstanding (excluding the currently outstanding warrants). The exact number of shares and Warrants that we will issue in this Rights Offering will depend on the number of Units that are subscribed for in the Rights Offering.

How was the Subscription Price determined?

In determining the Subscription Price, the pricing committee of our board of directors is expected to consider, among other things, the following factors:

- the current and historical trading prices of our common stock;
- the price at which shareholders might be willing to participate in the Rights Offering;
- the value of the Warrant being issued as a component of the Unit;

- our need for additional capital and liquidity;
- the cost of capital from other sources; and
- comparable precedent transactions, including the percentage of shares offered, the terms of the subscription rights being offered, the subscription price and the discount that the subscription price represented to the immediately prevailing closing prices for those offerings.

In conjunction with the review of these factors, our pricing committee will also review our history and prospects, including our past and present earnings and cash requirements, our prospects for the future, the outlook for our industry and our current financial condition. Our pricing committee believes that the Subscription Price should be designed to provide an incentive to our current shareholders and holders of the participating warrants to participate in the Rights Offering and exercise their Basic Subscription Right and their Over-Subscription Privilege.

The Subscription Price does not necessarily bear any relationship to any established criteria for value. You should not consider the Subscription Price as an indication of actual value of our company or our common stock. We cannot assure you that the market price of our common stock will not decline during or after the Rights Offering. You should obtain a current price quote for our common stock before exercising your Subscription Rights and make your own assessment of our business and financial condition, our prospects for the future, and the terms of this Rights Offering. Once made, all exercises of Subscription Rights are irrevocable.

Am I required to exercise all of the Basic Subscription Rights I receive in the Rights Offering?

No. You may exercise any number of your Basic Subscription Rights, or you may choose not to exercise any Basic Subscription Rights. If you do not exercise any Basic Subscription Rights, the number of shares of our common stock or number of shares underlying our warrants you own will not change. However, if you choose to not exercise your Basic Subscription Rights in full, your proportionate ownership interest in our company will decrease. If you do not exercise your Basic Subscription Rights in full, you will not be entitled to exercise your Over-Subscription Privilege.

How soon must I act to exercise my Subscription Rights?

If you received a Subscription Rights Statement and elect to exercise any or all of your Subscription Rights, the Subscription Agent must receive your completed and signed Subscription Rights Statement and payment for both your Basic Subscription Rights and any Over-Subscription Privilege you elect to exercise, including final clearance of any uncertified check, before the Rights Offering expires on July 26, 2016, at 5:00 PM Eastern Time. If you hold your shares in the name of a broker, dealer, custodian bank, or other nominee, your nominee may establish a deadline before the expiration of the Rights Offering by which you must provide it with your instructions to exercise your Subscription Rights, along with the required subscription payment.

May I transfer my Subscription Rights?

No. The Subscription Rights may be exercised only by the shareholders or participating warrant holders to whom they are distributed, and they may not be sold, transferred, assigned or given away to anyone else, other than by operation of law. As a result, a Subscription Rights Statement may be completed only by the shareholder or participating warrant holder who receives the statement. The Subscription Rights will not be listed for trading on any stock exchange or market.

Will our directors and executive officers participate in the Rights Offering?

To the extent they hold common stock as of the Record Date, our directors and executive officers will be entitled to participate in the Rights Offering on the same terms and conditions applicable to

other Rights holders. While none of our directors or executive officers has entered into any binding commitment or agreement to exercise Subscription Rights received in the Rights Offering, our directors and executive officers have indicated interests in subscribing for up to an aggregate of \$3.0 million in the Rights Offering, subject to potential proration.

Has the board of directors made a recommendation to shareholders and warrant holders regarding the Rights Offering?

No. Our board of directors is not making a recommendation regarding your exercise of the Subscription Rights. Stockholders and holders of the participating warrants who exercise Subscription Rights will incur investment risk on new money invested. We cannot predict the price at which our shares of common stock will trade after the Rights Offering. On June 28, 2016, the closing price of our common stock was \$6.00 per share. The market price for our common stock may be above the Subscription Price or may be below the Subscription Price. If you exercise your Subscription Rights, you may not be able to sell the underlying shares of our common stock or Warrants in the future at the same price or a higher price. You should make your decision based on your assessment of our business and financial condition, our prospects for the future, the terms of the Rights Offering and the information contained in this prospectus. See "Risk Factors" for discussion of some of the risks involved in investing in our securities.

How do I exercise my Subscription Rights?

If you are a shareholder of record (meaning you hold your shares of our common stock in your name and not through a broker, dealer, bank, or other nominee) or a holder of the participating warrants and you wish to participate in the Rights Offering, you must deliver a properly completed and signed Subscription Rights Statement, together with payment of the Subscription Price for both your Basic Subscription Rights and any Over-Subscription Privilege you elect to exercise, to the Subscription Agent before 5:00 PM Eastern Time, on July 26, 2016. If you are exercising your Subscription Rights through your broker, dealer, bank, or other nominee, you should promptly contact your broker, dealer, bank, or other nominee and submit your subscription documents and payment for the Units subscribed for in accordance with the instructions and within the time period provided by your broker, dealer, bank or other nominee.

What if my shares are held in "street name"?

If you hold your shares of our common stock in the name of a broker, dealer, bank, or other nominee, then your broker, dealer, bank, or other nominee is the record holder of the shares you own. The record holder must exercise the Subscription Rights on your behalf. Therefore, you will need to have your record holder act for you.

If you wish to participate in this Rights Offering and purchase Units, please promptly contact the record holder of your shares. We will ask the record holder of your shares, who may be your broker, dealer, bank, or other nominee, to notify you of this Rights Offering.

What form of payment is required?

You must timely pay the full Subscription Price for the full number of Units you wish to acquire pursuant to the exercise of Subscription Rights by delivering to the Subscription Agent a:

- cashier's check drawn on a U.S. bank; or
- wire transfer.

If you send a payment that is insufficient to purchase the number of Units you requested, or if the number of Units you requested is not specified in the forms, the payment received will be applied to

exercise your Subscription Rights to the fullest extent possible based on the amount of the payment received.

When will I receive my new shares of common stock and Warrants?

The Subscription Agent will arrange for the issuance of the common stock and Warrants as soon as practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected. All shares and Warrants that you purchase in the Rights Offering will be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration (DRS) account statement from our transfer agent reflecting ownership of these securities if you are a holder of record of shares or warrants. If you hold your shares in the name of a broker, dealer, bank, or other nominee, DTC will credit your account with your nominee with the securities you purchase in the Rights Offering.

When will I receive my Pre-Funded Warrants?

If you elect to receive any Pre-Funded Warrants, the Subscription Agent will arrange for the issuance of the Pre-Funded Warrants as soon as practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected. All Pre-Funded Warrants will be issued in physical form.

After I send in my payment and Subscription Rights Statement to the Subscription Agent, may I cancel my exercise of Subscription Rights?

No. Exercises of Subscription Rights are irrevocable unless the Rights Offering is terminated, even if you later learn information that you consider to be unfavorable to the exercise of your Subscription Rights. You should not exercise your Subscription Rights unless you are certain that you wish to purchase Units at the Subscription Price.

How much will our company receive from the Rights Offering?

Assuming that all 4,255,581 Units are sold in the Rights Offering, we estimate that the net proceeds from the Rights Offering will be approximately \$23.0 million, based on the midpoint of the expected Subscription Price range of \$6.00 per Unit, after deducting fees and expenses payable to the dealer-manager, and after deducting other expenses payable by us and excluding any proceeds received upon exercise of any Warrants issued in the Rights Offering.

Are there risks in exercising my Subscription Rights?

Yes. The exercise of your Subscription Rights involves risks. Exercising your Subscription Rights involves the purchase of additional shares of our common stock and Warrants to purchase common stock and you should consider this investment as carefully as you would consider any other investment. We cannot assure you that the market price of our common stock will exceed the Subscription Price, nor can we assure you that the market price of our common stock will not further decline during or after the Rights Offering. We also cannot assure you that you will be able to sell shares of our common stock or Warrants purchased in the Rights Offering at a price equal to or greater than the Subscription Price. In addition, you should carefully consider the risks described under the heading "Risk Factors" for discussion of some of the risks involved in investing in our securities.

Can the board of directors terminate or extend the Rights Offering?

Yes. Our board of directors may decide to terminate the Rights Offering at any time and for any reason before the expiration of the Rights Offering. We also have the right to extend the Rights Offering for additional periods in our sole discretion. We do not presently intend to extend the Rights Offering. We will notify shareholders and warrant holders if the Rights Offering is terminated or extended by issuing a press release.

If the Rights Offering is not completed or is terminated, will my subscription payment be refunded to me?

Yes. The Subscription Agent will hold all funds it receives in a segregated bank account until completion of the Rights Offering. If we do not complete the Rights Offering, all subscription payments received by the Subscription Agent will be returned as soon as practicable after the termination or expiration of the Rights Offering, without interest or penalty. If you own shares in "street name," it may take longer for you to receive your subscription payment because the Subscription Agent will return payments through the record holder of your shares.

How do I exercise my Rights if I live outside the United States?

The Subscription Agent will hold Subscription Rights Statements for shareholders having addresses outside the United States. To exercise Subscription Rights, foreign shareholders must notify the Subscription Agent and timely follow other procedures described in the section entitled "The Rights Offering—Foreign Shareholders."

What fees or charges apply if I purchase shares in the Rights Offering?

We are not charging any fee or sales commission to issue Subscription Rights to you or to issue shares or Warrants to you if you exercise your Subscription Rights. If you exercise your Subscription Rights through a broker, dealer, custodian bank, or other nominee, you are responsible for paying any fees your broker, dealer, bank, or other nominee may charge you.

What are the U.S. federal income tax consequences of exercising my Subscription Rights?

For U.S. federal income tax purposes, we do not believe you should recognize income or loss in connection with the receipt or exercise of Subscription Rights in the Rights Offering. You should consult your tax advisor as to the tax consequences of the Rights Offering in light of your particular circumstances. For a more detailed discussion, see "Material U.S. Federal Income Tax Consequences."

To whom should I send my forms and payment?

If your shares are held in the name of a broker, dealer, bank, or other nominee, then you should send your subscription documents and subscription payment to that broker, dealer, bank, or other nominee. If you are the record holder or a holder of participating warrants, then you should send your Subscription Rights Statement and payment of your subscription price to the Subscription Agent hand delivery, first class mail or courier service to:

By Mail:
Wells Fargo Bank, N.A.
Shareowner Services
Voluntary Corporate Actions
P.O. Box 64858
St. Paul, Minnesota 55164-0858

By Hand or Overnight Courier:
Wells Fargo Bank, N.A.
Shareowner Services
Voluntary Corporate Actions
1110 Centre Pointe Curve, Suite 101
Mendota Heights, Minnesota 55120

You or, if applicable, your nominee are solely responsible for completing delivery to the Subscription Agent of your subscription documents, Subscription Rights Statement and payment. You should allow sufficient time for delivery of your subscription materials to the Subscription Agent before the expiration of the Rights Offering at 5:00 PM Eastern Time on July 26, 2016.

Whom should I contact if I have other questions?

If you have other questions or need assistance, please contact the dealer-manager for the Rights Offering:

Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745

Who is the dealer-manager?

Maxim Group LLC will act as dealer-manager for the Rights Offering. Under the terms and subject to the conditions contained in the dealer-manager agreement, the dealer-manager will use its best efforts to solicit the exercise of Subscription Rights. We have agreed to pay the dealer-manager certain fees for acting as dealer-manager and to reimburse the dealer-manager for certain out-of-pocket expenses incurred in connection with this offering. The dealer-manager is not underwriting or placing any of the Subscription Rights or the Units, shares of common stock or Warrants being issued in this offering, and does not make any recommendation with respect to such Subscription Rights (including with respect to the exercise or expiration of such Subscription Rights), Units, shares of common stock or Warrants. See "Plan of Distribution" for a discussion of the fees and expenses to be paid to the dealer-manager in connection with this Rights Offering.

PROSPECTUS SUMMARY

The items in the following summary are described in more detail later in this prospectus and in the documents we incorporate by reference. This summary provides an overview of selected information and does not contain all of the information you should consider. Before investing in our common stock, you should read the entire prospectus carefully, including the information set forth under the headings "Risk Factors "and the consolidated financial statements and related notes and additional information included or incorporated by reference in this prospectus.

OUR COMPANY

Our Business

Onconova Therapeutics, Inc., sometimes referred to as "we" or the "Company," is a clinical-stage biopharmaceutical company focused on discovering and developing novel small molecule drug candidates to treat cancer. Using our proprietary chemistry platform, we have created an extensive library of targeted anti-cancer agents designed to work against cellular pathways important to cancer cells. We believe that the drug candidates in our pipeline have the potential to be efficacious in a variety of cancers. We have one Phase 3 clinical-stage product candidate and two other clinical-stage product candidates (one of which is being developed for treatment of acute radiation syndromes) and several preclinical programs. Substantially all of our current effort is focused on our lead product candidate, rigosertib. Rigosertib is being tested in both intravenous and oral formulations as a single agent, and the oral formulation is also being tested in combination with azacitidine, in clinical trials for patients with myelodysplastic syndromes, or MDS, and related cancers.

In December 2015, we enrolled the first patient in a randomized controlled Phase 3 clinical trial of rigosertib IV in a population of patients with higher-risk MDS after failure of hypomethylating agent, or HMA, therapy. The trial, which we refer to as INSPIRE, is expected to enroll approximately 225 patients at more than 100 sites globally. The primary endpoint of INSPIRE is overall survival, and an interim analysis is anticipated. We anticipate reporting topline data from the INSPIRE trial in 2018.

In the first quarter of 2016, we took significant actions to conserve cash, including reduction in personnel and expenditures. While we will continue to take cash conservation actions where appropriate, our costs will increase in subsequent quarters as more INSPIRE sites open and more patients enroll in the INSPIRE trial. We believe that our cash and cash equivalents, prior to our receipt of any proceeds from this Rights Offering, together with anticipated contractual cost-sharing payments from Baxalta GmbH, or Baxalta, for a portion of the INSPIRE trial costs, will be sufficient to fund our ongoing trials and operations into the first quarter of 2017.

We are exploring various sources of funding for continued development of rigosertib in MDS and acute myelogenous leukemia, or AML, as well as our ongoing operations. Completion of the Rights Offering is not subject to us raising a minimum offering amount and therefore the net proceeds from the Rights Offering may be insufficient to meet our objectives. Even if we sell all of the Units subject to the Rights Offering, we will need to obtain additional financing in the future in order to fully fund rigosertib or any other product candidates through the regulatory approval process.

Due to our ongoing losses and our accumulated deficit in combination with other factors, the opinion of our independent registered public accounting firm on our audited consolidated financial statements for our fiscal year ended December 31, 2015 contains an explanatory paragraph regarding substantial doubt about our ability to continue as a going concern. Even if we sell all of the Units subject to the Rights Offering, if we are unable to obtain sufficient additional funding, through future financings or through strategic and collaborative transactions and arrangements, we may not have sufficient resources to complete our INSPIRE trial and we may continue to delay, scale-back or

eliminate certain of our planned research, drug discovery and development activities and certain other aspects of our operations, or we may not be able to continue as a going concern.

Rigosertib

Rigosertib is a small molecule that inhibits cellular signaling by acting as a Ras mimetic. This is believed to be mediated by the binding of rigosertib to the Ras-binding domain, or RBD, found in many Ras effector proteins, including the Raf and PI3K kinases. This mechanism of action provides a new approach to block the interactions between Ras and its targets containing RBD sites. Rigosertib is being tested as a single agent and in combination with azacitidine, in clinical trials of patients with MDS and related cancers. We have enrolled more than 1,200 patients in rigosertib clinical trials. We are a party to a license and development agreement with Baxalta, which granted Baxalta certain rights to commercialize rigosertib in Europe. The Baxalta agreement is scheduled to terminate August 30, 2016, at which time the European rights will revert to us at no cost. We are also party to a collaboration agreement with Symbio Pharmaceuticals Limited, or Symbio, which grants Symbio certain rights to commercialize rigosertib in Japan and Korea. We have retained development and commercialization rights to rigosertib in the rest of the world, including in the United States, although we will consider licensing commercialization rights to other territories as a source of additional funding.

Rigosertib IV for higher-risk MDS

In early 2014, we announced topline survival results from our "ONTIME" trial, a multi-center Phase 3 clinical trial of rigosertib IV as a single agent. The ONTIME trial did not meet its primary endpoint in the intent-to-treat population, although improvements in median overall survival were observed in various pre-specified and exploratory subgroups of higher-risk MDS patients.

During 2014 and 2015, we held meetings with the U.S. Food and Drug Administration, or FDA, European Medicines Agency, or EMA, and several European national regulatory authorities to discuss and seek guidance on a path for approval of rigosertib IV in higher-risk MDS patients whose disease had failed HMA therapy. After discussions with the FDA and EMA, we refined our patient eligibility criteria by defining a more homogenous patient population. After regulatory feedback, input from key opinion leaders in the U.S. and Europe and based on learnings from the ONTIME study, we designed a new randomized controlled Phase 3 trial, referred to as INSPIRE, with overall survival as a primary endpoint. The INSPIRE trial is enrolling higher-risk MDS patients under 80 years of age who have progressed on, or failed to respond to, previous treatment with HMAs within the first nine months after initiation of HMA therapy, and had their last dose of HMA within six months prior to enrollment in the trial. The primary endpoint of this study is overall survival, and an interim analysis is anticipated. This randomized trial of approximately 225 patients is expected to be conducted at more than 100 sites globally. In August 2015, we submitted an updated investigational new drug application, or IND, to the FDA, and in August 2015 we submitted Clinical Trial Applications, or CTAs, with the United Kingdom, German and Austrian regulatory authorities for IV rigosertib as a treatment for higher-risk MDS after failure of HMA therapy. The first CTA has been cleared by the Medicines and Healthcare products Regulatory Agency. The first patient in the INSPIRE trial was enrolled at the MD Anderson Cancer Center in December 2015 and, as of May 18, 2016, 59 clinical sites are open (43 in the U.S. and Europe and 16 in Japan) and can recruit patients. The first patient in Europe was enrolled on March 18, 2016.

Rigosertib oral in combination with azacitidine for MDS and AML

We have completed enrollment in the Phase 2 portion of an open label Phase 1/2 clinical trial testing rigosertib oral in combination with the approved dose of injectable azacitidine for patients with higher-risk MDS and AML. This study is based on our published preclinical data demonstrating synergistic activity of this combination. The Phase 2 portion of the trial was designed to assess whether

treatment with rigosertib, in combination with the approved dose of injectable azacitidine, reduces the number of bone marrow blasts, improves peripheral blood counts and can resensitize the marrow blast cells to azacitidine for patients who were previously exposed to azacitidine. Patient enrollment in the Phase 2 portion of this trial was completed in the fourth quarter of 2015 and interim data were summarized by way of an oral presentation at the ASH Annual Meeting in December 2015.

The Phase 2 trial included both front-line MDS patients (that is, patients not previously treated with HMAs) and MDS patients whose disease had failed prior HMA therapy (second-line patients). The presentation at ASH included results from a total of 37 MDS patients treated with the recommended Phase 2 dose of oral rigosertib (560 mg AM/280 mg PM) plus the full standard dose of injectable azacitidine. The combination of oral rigosertib and azacitidine was generally well tolerated, with a median duration of treatment of four months (range 1 to 27 months).

At the time of the presentation, 30 MDS patients were evaluable for efficacy assessment per 2006 IWG, criteria. Twenty-three of 30 patients (77%) responded to the combination therapy, including six patients who had complete remissions. Hematologic improvement was observed in 13 of 26 patients that were evaluable for this part of the analysis. Notably, 16 of 19 (84%) HMA-naïve patients had a response to the combination therapy and 7 of 11 (64%) patients whose disease had previously failed HMAs responded. As of December 2015, the median duration of these responses had not yet been reached. Additional data collection for efficacy and safety continues for the patients remaining on study and may impact the final results of the trial. Updated data from the Phase 2 Trial is expected to be presented at the European Hematology Association Meeting in June 2016.

Rigosertib oral for lower-risk MDS

Higher-risk MDS patients suffer from a shortfall in normal circulating blood cells, or cytopenias, as well as elevated levels of cancer cells, or blasts in their bone marrow and peripheral blood, whereas lower-risk MDS patients suffer mainly from cytopenias, that is low levels of red blood cells, white blood cells and/or platelets. Thus, lower-risk MDS patients depend on transfusions and growth factors or other therapies to improve their low blood counts.

We have explored single agent rigosertib oral as a treatment for lower-risk MDS in two Phase 2 clinical trials, 09-05 and 09-07. In December 2013, we presented data at the Annual ASH Meeting from the 09-05 Phase 2 trial. To date, Phase 2 clinical data have shown encouraging signs of efficacy of single agent oral rigosertib in transfusion-dependent, lower-risk MDS patients. Rigosertib has been generally well tolerated, except for urinary side effects at higher dose levels. Additional clinical testing will be needed to evaluate dosing and schedule modifications and their impact on efficacy and toxicity of oral rigosertib in lower-risk MDS patients.

Data presented from the 09-05 trial also suggested the potential of a genomic methylation assessment of bone marrow cells to prospectively identify lower-risk MDS patients likely to respond to oral rigosertib. We therefore expanded the 09-05 trial by adding an additional cohort of 20 patients to advance the development of this genomic methylation test. Enrollment in this expansion cohort has been completed. We are working with academic collaborators to refine this genomic methylation test.

Other Programs

The vast majority of the Company's efforts are now devoted to the advanced stage development of rigosertib for unmet medical needs of MDS patients. Other programs are either paused, inactive or require only minimal internal resources and efforts.

Briciclib

Briciclib, another of our product candidates, is a small molecule targeting an important intracellular regulatory protein, cyclin D1, which is often found at elevated levels in cancer cells. Cyclin D1 expression is regulated through a process termed cap-dependent translation, which requires the function of eukaryotic initiation factor 4E protein, or eIF4E. In vitro evidence indicates briciclib binds to eIF4E, blocking cap-dependent translation of cyclin D1 and other cancer proteins, such as c-MYC, leading to tumor cell death. We have been conducting a Phase 1 multisite dose-escalation trial of briciclib in patients with advanced solid tumors refractory to current therapies. Safety and efficacy assessments are complete in six of the seven dose-escalation cohorts of patients in this trial. As of December 2015, the briciclib IND is on full clinical hold following a drug product lot testing failure. If we elect to continue development of briciclib, we would be required to undertake appropriate remedial actions prior to re-initiating the clinical trial and completing the final dose-escalation cohort.

Recilisib

Recilisib is a product candidate being developed in collaboration with the U.S. Department of Defense for acute radiation syndromes. We have completed four Phase 1 trials to evaluate the safety and pharmacokinetics of recilisib in healthy human adult subjects using both subcutaneous and oral formulations. We have also conducted animal studies and clinical trials of recilisib under the FDA's Animal Efficacy Rule, which permits marketing approval for new medical countermeasures for which conventional human efficacy studies are not feasible or ethical, by relying on evidence from studies in appropriate animal models to support efficacy in humans. Ongoing studies of recilisib, focusing on animal models and biomarker development to assess the efficacy of recilisib are being conducted by third parties with government funding. We anticipate that any future development of recilisib beyond these ongoing studies would be conducted solely with government funding or by collaboration.

Preclinical Product Candidates

In addition to our three clinical-stage product candidates, we have several product candidates that target kinases, cellular metabolism or cell division in preclinical development. We may explore additional collaborations to further the development of these product candidates as we focus internally on our more advanced programs. We presented data related to ON 0123300, our novel inhibitor of ARK5 and CDK4/6 at the American Association of Cancer Research (AACR) conference in April, 2016.

Recent Developments

We effected a one-for-ten reverse stock split of our common stock as of 5:00 PM Eastern Time on May 31, 2016. All share and per share data has been restated to reflect the one-for-ten reverse stock split.

Corporate Information

We were incorporated in Delaware in December 1998 and commenced operations in January 1999. Our principal executive offices are located at 375 Pheasant Run, Newtown, Pennsylvania 18940, and our telephone number is (267) 759-3680. Our website address is www.onconova.com. The information on, or that can be accessed through, our website is not part of this prospectus.

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. An emerging growth company may take advantage of specified reduced

reporting requirements and is relieved of certain other significant requirements that are otherwise generally applicable to public companies. As an emerging growth company,

- we may present only two years of audited financial statements and only two years of related Management's Discussion & Analysis of Financial Condition and Results of Operations;
- we are exempt from the requirement to obtain an attestation and report from our auditors on the assessment of our internal control over financial reporting pursuant to the Sarbanes-Oxley Act of 2002;
- we are permitted to provide less extensive disclosure about our executive compensation arrangements;
- we are not required to give our stockholders non-binding advisory votes on executive compensation or golden parachute arrangements; and
- we have elected to use an extended transition period for complying with new or revised accounting standards.

We may take advantage of these provisions until July 24, 2018. However, if certain events occur prior to such date, including if we become a "large accelerated filer," our annual gross revenues exceed \$1.0 billion or we issue more than \$1.0 billion of non-convertible debt in any three-year period, we will cease to be an emerging growth company.

SUMMARY CONSOLIDATED FINANCIAL DATA

The following summary consolidated statements of operations data for the years ended December 31, 2015 and 2014 and the consolidated balance sheet data as of December 31, 2015, have been derived from our audited consolidated financial statements that are included in the documents incorporated by reference into this prospectus. The summary historical financial information as of and for the three months ended March 31, 2016 has been derived from our unaudited consolidated financial statements that are included in the documents incorporated by reference into this prospectus. The unaudited financial information as of and for the three months ended March 31, 2016 has been prepared on the same basis as our audited financial statements and includes, in the opinion of management, all adjustments, consisting of only normal recurring adjustments, necessary to fairly present the data for such periods. All share and per share data has been restated to reflect our one-for-ten reverse stock split effective May 31, 2016. The historical financial data presented below is not necessarily indicative of our financial results in future periods. You should read the summary consolidated financial data in conjunction with those financial statements and the accompanying notes and "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the documents incorporated by reference into this prospectus. Our consolidated financial statements are prepared and presented in accordance with United States generally accepted accounting principles, or U.S. GAAP.

Condensed Consolidated Statements of Operations Data:

	For the Years ended December 31,		For the three months ended March 31, 2016
	2015	2014	
Revenue	\$ 11,456,000	\$ 800,000	\$ 1,474,000
Operating expenses:			
General and administrative	9,533,000	15,119,000	3,172,000
Research and development	25,895,000	49,425,000	5,822,000
Total operating expenses	<u>35,428,000</u>	<u>64,544,000</u>	<u>8,994,000</u>
Loss from operations	(23,972,000)	(63,744,000)	(7,520,000)
Change in fair value of warrant liability	—	20,000	271,000
Other income (expense), net	(35,000)	(52,000)	9,000
Net loss before income taxes	(24,007,000)	(63,776,000)	(7,240,000)
Income taxes	16,000	19,000	—
Net loss	(24,023,000)	(63,795,000)	(7,240,000)
Net loss attributable to non-controlling interest	44,000	113,000	—
Net loss attributable to Onconova Therapeutics, Inc	<u>(23,979,000)</u>	<u>(63,682,000)</u>	<u>\$ (7,240,000)</u>
Net loss per share of common stock, basic and diluted	\$ (10.54)	\$ (29.41)	\$ (2.65)
Basic and diluted weighted average shares outstanding	<u>2,273,976</u>	<u>2,165,354</u>	<u>2,731,590</u>

Consolidated Balance Sheet Data:

(Stockholders' equity has been restated to reflect the one-for-ten reverse stock split and decrease in authorized common shares from 75,000,000 to 25,000,000)

	December 31, 2015	March 31, 2016
Assets		
Current assets:		
Cash and cash equivalents	\$ 19,799,000	\$ 16,835,000
Receivables	1,504,000	1,368,000
Prepaid expenses and other current assets	1,832,000	1,153,000
Restricted cash	50,000	50,000
Total current assets	23,185,000	19,406,000
Property and equipment, net	248,000	224,000
Other non-current assets	12,000	12,000
Total assets	<u>\$ 23,445,000</u>	<u>\$ 19,642,000</u>
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	\$ 3,421,000	\$ 3,296,000
Accrued expenses and other current liabilities	3,729,000	3,891,000
Deferred revenue	455,000	455,000
Total current liabilities	7,605,000	7,642,000
Warrant liability	—	295,000
Deferred revenue, non-current	5,000,000	4,886,000
Total liabilities	<u>12,605,000</u>	<u>12,823,000</u>
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, \$0.01 par value, 5,000,000 authorized at December 31, 2015 and March 31, 2016, none issued and outstanding at March 31, 2016 and December 31, 2015	—	—
Common stock, \$0.01 par value, 25,000,000 authorized at December 31, 2015 and March 31, 2016, 2,546,419 and 2,740,212 shares issued and outstanding at December 31, 2015 and March 31, 2016	25,000	27,000
Additional paid-in capital	328,564,000	331,775,000
Accumulated other comprehensive loss	(22,000)	(16,000)
Accumulated deficit	(318,557,000)	(325,797,000)
Total Onconova Therapeutics, Inc. stockholders' equity	10,010,000	5,989,000
Non-controlling interest	830,000	830,000
Total stockholders' equity	<u>10,840,000</u>	<u>6,819,000</u>
Total liabilities and stockholders' equity	<u>\$ 23,445,000</u>	<u>\$ 19,642,000</u>

SUMMARY OF THE RIGHTS OFFERING

Securities to be offered

We are distributing to you, at no charge, 1.5 non-transferable Subscription Rights to purchase one Unit for every share of our common stock that you owned on the Record Date, either as a holder of record or, in the case of shares held of record by brokers, banks, or other nominees, on your behalf, as a beneficial owner of such shares. Each Unit consists of one share of common stock and 0.75 of a Warrant representing the right to purchase one share of common stock at an exercise price of \$ _____ per share, 120% of the per Unit price.

For certain investors whose subscriptions may result in the purchaser beneficially owning more than 4.99% of our outstanding common stock, such investors may elect to receive in the Rights Offering, in lieu of shares of common stock, certain pre-funded warrants (which we refer to as the Pre-Funded Warrants) to purchase the same amount of shares of common stock. If you do not wish to exceed the ownership threshold, you may elect to receive a Pre-Funded Warrant in lieu of any share of common stock underlying the Units for which you have subscribed. You will not be eligible to elect to receive Pre-Funded Warrants, except to the extent that your beneficial ownership could exceed 4.99% of the shares of common stock outstanding following the consummation of the Rights Offering. Each Pre-Funded Warrant will have an exercise price of \$0.01, and the subscription price per Unit for any such electing investors will be reduced to \$ _____ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a shareholder of the Company.

Holders of our currently outstanding participating warrants will also be entitled, pursuant to the terms of such warrants, to receive 1.5 Subscription Rights to purchase one Unit for every share of common stock as if each of such participating warrants had been exercised immediately prior to the record date for the Rights Offering.

Size of offering

4,255,581 Units, each consisting of one share of common stock and 0.75 of a Warrant representing the right to purchase one share of common stock at an exercise price of \$ _____ per share, 120% of the per Unit price.

Subscription Price

Expected to be between \$5.75 and \$6.25 per Unit. The exact Subscription Price per Unit will be determined by our board of directors or pricing committee prior to the effectiveness of the registration statement of which this prospectus is a part.

Warrants

Each Warrant entitles the holder to purchase one share of common stock at an exercise price of \$ _____ per share, 120% of the per Unit price, from the date of issuance through its expiration on _____, 2021. The Warrants will be

Pre-Funded Warrants	<p>exercisable by paying the exercise price in cash, or, solely during any period when a registration statement for the exercise of the Warrants is not in effect, exercisable on a cashless basis. We have applied to list the Warrants on NASDAQ under the symbol "ONTXW," although there is no assurance that a sufficient number of Subscription Rights will be exercised so that the Warrants will meet the minimum listing criteria to be accepted for listing on NASDAQ. After the one-year anniversary of issuance, we may redeem the Warrants for \$0.001 per Warrant if the volume weighted average price of our common stock is above \$ _____ per share, 300% of the exercise price, for each of 10 consecutive trading days.</p> <p>Each Pre-Funded Warrant entitles the holder to purchase one share of common stock at an exercise price of \$0.01 per share, and the subscription price per Unit for any such electing investors will be reduced to \$ _____ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). Each Pre-Funded Warrant will be exercisable from the date of issuance through its expiration on _____, 2021. The Pre-Funded Warrants will be exercisable by paying the exercise price in cash or on a cashless basis. The Pre-Funded Warrants will not be listed for trading on any stock exchange or market. The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a shareholder of the Company. See "Description of Securities—Pre-Funded Warrants Issuable in the Rights Offering." 5:00 PM Eastern Time, July 7, 2016.</p>
Record Date	
Subscription Right	<p>Each Subscription Right consists of a Basic Subscription Right and an Over-Subscription Privilege.</p>
Basic Subscription Rights	<p>Basic Subscription Right will entitle you to purchase one Unit at the Subscription Price.</p>
Over-Subscription Privilege	<p>If you exercise your Basic Subscription Rights in full, you may also choose to purchase a portion of any Units that are not purchased by our other shareholders or holders of participating warrants through the exercise of their Basic Subscription Rights. You may subscribe for additional Units pursuant to this Over-Subscription Privilege, subject to proration described elsewhere.</p>
Expiration date	<p>The Subscription Rights will expire at 5:00 PM Eastern Time, on July 26, 2016. We reserve the right to extend the expiration date in our sole discretion.</p>
Procedure for exercising Subscription Rights	<p>To exercise your Subscription Rights, you must take the following steps:</p> <p>If you are a record holder of our common stock or a holder of participating warrants, you must deliver payment and a properly completed Subscription Rights Statement to the</p>

Delivery of shares and Warrants

Subscription Agent to be received before 5:00 PM Eastern Time, on July 26, 2016. You may deliver the documents and payments by first class mail or courier service. If you use first class mail for this purpose, we recommend using registered mail, properly insured, with return receipt requested.

If you are a beneficial owner of shares that are registered in the name of a broker, dealer, custodian bank, or other nominee, you should instruct your broker, dealer, custodian bank, or other nominee to exercise your Subscription Rights on your behalf. Please follow the instructions of your nominee, who may require that you meet a deadline earlier than 5:00 PM Eastern Time, on July 26, 2016.

As soon as practicable after the expiration of the Rights Offering, the Subscription Agent will arrange for the issuance of the shares of common stock and Warrants purchased pursuant to the Rights Offering. All shares and Warrants that are purchased in the Rights Offering will be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration (DRS) account statement from our transfer agent reflecting ownership of these securities if you are a holder of record of shares or warrants. If you hold your shares in the name of a custodian bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the securities you purchased in the Rights Offering.

Non-transferability of Subscription Rights

The Subscription Rights may not be sold, transferred, assigned or given away to anyone. The Subscription Rights will not be listed for trading on any stock exchange or market.

Transferability of Warrants

The Warrants will be separately transferable following their issuance and through their expiration five years from the issuance date.

No board recommendation

Our board of directors is not making a recommendation regarding your exercise of the Subscription Rights. You are urged to make your decision to invest based on your own assessment of our business and the Rights Offering. Please see "Risk Factors" for a discussion of some of the risks involved in investing in our securities.

Directors and Officers

While none of our directors or executive officers has entered into any binding commitment or agreement to exercise Subscription Rights received in the Rights Offering, our directors and executive officers have indicated interests in subscribing for up to an aggregate of \$3.0 million in the Rights Offering, subject to potential proration.

No revocation

All exercises of Subscription Rights are irrevocable, even if you later learn of information that you consider to be unfavorable to the exercise of your Subscription Rights.

Use of proceeds

We intend to use the net proceeds from this Rights Offering to continue funding INSPIRE, our ongoing Phase 3 clinical trial of rigosertib IV in a population of patients with

Material U.S. federal income tax consequences

higher-risk MDS after failure of HMA therapy, and, to a lesser extent, for other development of our clinical and preclinical programs, other research and development activities, business development and general corporate purposes, which may include capital expenditures and funding our working capital needs. See "Use of Proceeds." For U.S. federal income tax purposes, we do not believe you should recognize income or loss upon receipt or exercise of a Subscription Right. You should consult your own tax advisor as to the tax consequences of the Rights Offering in light of your particular circumstances. See "Material U.S. Federal Income Tax Consequences."

Extension and termination

Although we do not presently intend to do so, we may extend the Rights Offering for additional time in our sole discretion. Our board of directors may for any reason terminate the Rights Offering at any time before the completion of the Rights Offering.

Subscription Agent Questions

Wells Fargo Bank, N.A.

If you have any questions about the Rights Offering, please contact the dealer-manager, Maxim Group LLC, at 405 Lexington Avenue, New York, New York 10174, Attention Syndicate Department, email: syndicate@maximgrp.com or telephone: (212) 895-3745.

Market for common stock

Our common stock is listed on NASDAQ under the symbol "ONTX." See "Market Price of our Common Stock and Related Stockholder Matters."

Risk factors

Before you exercise your Subscription Rights to purchase Units, you should be aware that there are risks associated with your investment, and you should carefully read and consider risks described in the section captioned "Risk Factors" together with all of the other information included in this prospectus.

Dealer-Manager Distribution arrangements

Maxim Group LLC.

Under the terms and subject to the conditions contained in the dealer-manager agreement, the dealer-manager will use its best efforts to solicit the exercise of Subscription Rights. We have agreed to pay the dealer-manager certain fees for acting as dealer-manager and to reimburse the dealer-manager for certain out-of-pocket expenses incurred in connection with this offering. The dealer-manager is not underwriting or placing any of the Subscription Rights or the Units, shares of common stock or Warrants being issued in this offering, and does not make any recommendation with respect to such Subscription Rights (including with respect to the exercise or expiration of such Subscription Rights), Units, shares of common stock or Warrants. See "Plan of Distribution" for a discussion of the fees and expenses to be paid to the dealer-manager.

RISK FACTORS

Our business is influenced by many factors that are difficult to predict, and that involve uncertainties that may materially affect actual operating results, cash flows and financial condition. Before making an investment decision, you should carefully consider these risks, including those set forth below and those described in the "Risk Factors" section of our most recent Annual Report on Form 10-K, filed with the Commission on March 28, 2016, as revised or supplemented by our Quarterly Reports on Form 10-Q filed with the SEC since the filing of our most recent Annual Report on Form 10-K, each of which is incorporated by reference into this prospectus, and you should also carefully consider any other information we include or incorporate by reference in this prospectus.

Any of the risks we describe below or in the information incorporated herein by reference in this prospectus could cause our business, financial condition or operating results to suffer. The market price of our common stock could decline if one or more of these risks and uncertainties develop into actual events. You could lose all or part of your investment.

Risks Related to the Rights Offering

We will incur substantial expenses in connection with the Rights Offering, which may not return adequate value if the Rights Offering is ultimately not consummated or successful.

The estimated expenses for the Rights Offering are approximately \$448,964, excluding fees and expenses of the dealer-manager that we have engaged to assist us with the Rights Offering. If the registration statement of which this prospectus is a part is not declared effective, the Rights Offering is not commenced or the Rights Offering is not ultimately consummated or successful, we will incur these expenses nonetheless. We will provide to the dealer-manager upon completion of the Rights Offering a non-accountable expense allowance equal to the lesser of \$100,000 or 3% of the gross proceeds of the Rights Offering for expenses incurred in connection with the Rights Offering. We advanced \$30,000 against out-of-pocket accountable expenses to Maxim Group LLC upon its engagement as a dealer-manager; provided that Maxim Group LLC will promptly reimburse to us (i) any portion of the advance not used for actual out-of-pocket expenses, if the Rights Offering is not completed, and (ii) the full amount of the advance, if the Rights Offering is completed. See "Plan of Distribution."

Your interest in our company may be diluted as a result of this Rights Offering.

Shareholders who do not fully exercise their Subscription Rights should expect that they will, at the completion of this offering, own a smaller proportional interest in our company than would otherwise be the case had they fully exercised their Basic Subscription Right and Over-Subscription Privilege. Further, the shares issuable upon the exercise of the Warrants to be issued pursuant to the Rights Offering will dilute the ownership interest of shareholders not participating in this offering or holders of Warrants issued pursuant to this offering who have not exercised them.

Further, because the price per Unit being offered may be substantially higher than the net tangible book value per share of our common stock, you may suffer substantial dilution in the net tangible book value of the common stock you purchase in this offering. If you purchase Units in this offering at the Subscription Price, you may suffer immediate and substantial dilution in the net tangible book value of the common stock. See "Dilution" in this prospectus for a more detailed discussion of the dilution which may incur in connection with this offering.

Completion of the Rights Offering is not subject to us raising a minimum offering amount and we will still need additional funding to carry out our proposed operating activities, including our INSPIRE trial, after the Rights Offering.

Completion of the Rights Offering is not subject to us raising a minimum offering amount and therefore the net proceeds from the Rights Offering may be insufficient to meet our objectives, thereby

increasing the risk to investors in this offering, including investing in a company that continues to require capital. Even if we sell all of the Units subject to the Rights Offering, we will need to obtain additional financing in the future in order to fully fund rigosertib or any other product candidates through the regulatory approval process.

Due to our ongoing losses and our accumulated deficit in combination with other factors, the opinion of our independent registered public accounting firm on our audited consolidated financial statements for our fiscal year ended December 31, 2015 contains an explanatory paragraph regarding substantial doubt about our ability to continue as a going concern. Even if we sell all of the Units subject to the Rights Offering, if we are unable to obtain sufficient additional funding, through future financings or through strategic and collaborative transactions and arrangements, we may not have sufficient resources to complete our INSPIRE trial and we may continue to delay, scale-back or eliminate certain of our planned research, drug discovery and development activities and certain other aspects of our operations, or we may not be able to continue as a going concern.

This Rights Offering may cause the trading price of our common stock to decrease.

The Subscription Price, together with the number of shares of common stock we propose to issue and ultimately will issue if this Rights Offering is completed, may result in an immediate decrease in the market price of our common stock. This decrease may continue after the completion of this Rights Offering. If that occurs, you may have committed to buy shares of common stock in the Rights Offering at a price greater than the prevailing market price. We cannot predict the effect, if any, that the availability of shares for future sale represented by the Warrants issued in connection with the Rights Offering, or the ability to trade the Warrants themselves, will have on the market price of our common stock from time to time. Further, if a substantial number of Subscription Rights are exercised and the holders of the shares received upon exercise of those Subscription Rights or the related Warrants choose to sell some or all of the shares underlying the Subscription Rights or the related Warrants, the resulting sales could depress the market price of our common stock. Following the exercise of your Subscription Rights you may not be able to sell your common stock at a price equal to or greater than the Subscription Price.

Because the exercise of your Subscription Rights is not revocable, you could be committed to buying shares of common stock above the prevailing market price.

Once you exercise your Subscription Rights, you may not revoke such exercise even if you later learn information that you consider to be unfavorable to the exercise of your Subscription Rights. The market price of our shares of common stock may decline prior to the expiration of this offering or a Subscribing Rights holder may not be able to sell shares of common stock purchased in this offering at a price equal to or greater than the Subscription Price. Until shares of our common stock are delivered upon expiration of the Rights Offering, you will not be able to sell or transfer the shares of our common stock that you purchase in the Rights Offering. Any such delivery will occur as soon as practicable after the Rights Offering has expired, payment for the shares of common stock and attached Warrants subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected.

If we terminate this offering for any reason, we will have no obligation other than to return subscription monies as soon as practicable.

We may decide, in our sole discretion and for any reason, to cancel or terminate the Rights Offering at any time prior to the expiration date. If this offering is cancelled or terminated, we will have no obligation with respect to Subscription Rights that have been exercised except to return as soon as practicable, without interest, the subscription payments deposited with the Subscription Agent.

If we terminate this offering and you have not exercised any Subscription Rights, such Subscription Rights will expire worthless.

Our common stock price may be volatile as a result of this Rights Offering.

The trading price of our common stock may fluctuate substantially. The price of the common stock that will prevail in the market after this offering may be higher or lower than the Subscription Price depending on many factors, some of which are beyond our control and may not be directly related to our operating performance. These factors include, but are not limited to, the following:

- results of clinical trials of our product candidates or those of our competitors;
- regulatory actions with respect to our products or our competitors' products;
- actual or anticipated changes in our growth rate relative to our competitors;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures, collaborations or capital commitments;
- the success of competitive products or technologies;
- regulatory or legal developments in the United States and other countries;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the level of expenses related to any of our product candidates or clinical development programs;
- the results of our efforts to in-license or acquire additional product candidates or products;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- variations in our financial results or those of companies that are perceived to be similar to us;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us, our insiders or our other stockholders;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors; and
- general economic, industry and market conditions.

Additionally, the stock market historically has experienced significant price and volume fluctuations. These fluctuations are often unrelated to the operating performance of particular companies. These broad market fluctuations may cause declines in the trading price and market value of our common stock.

We cannot assure you that the trading price of our common stock will not decline after you elect to exercise your Subscription Rights. If that occurs, you may have committed to buy shares of common stock in the Rights Offering at a price greater than the prevailing market price and could have an immediate unrealized loss. Moreover, we cannot assure you that, following the exercise of your Subscription Rights, you will be able to sell your common stock at a price equal to or greater than the

Subscription Price, and you may lose all or part of your investment in our common stock. Until shares are delivered upon expiration of the Rights Offering, you will not be able to sell the shares of our common stock that you purchase in the Rights Offering. Shares of our common stock purchased will be issued as soon as practicable after the Rights Offering has expired, payment for the shares of common stock and attached Warrants subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected. We will not pay you interest on funds delivered to the Subscription Agent pursuant to your exercise of Subscription Rights.

Because we do not have any formal commitments from any of our shareholders to participate in the Rights Offering, the net proceeds we receive from the Rights Offering may be lower than we currently anticipate.

We do not have any formal commitments from any of our shareholders to participate in the Rights Offering, and we cannot assure you that any of our shareholders or warrant holders will exercise all or any part of their Basic Subscription Rights or their Over-Subscription Privilege. If our shareholders or participating warrant holders subscribe for fewer shares of our common stock than we currently anticipate, the net proceeds we receive from the Rights Offering could be significantly lower than we currently expect.

The Subscription Price determined for this offering is not an indication of the fair value of our common stock.

In determining the Subscription Price, the pricing committee of our board of directors considered a number of factors, including, but not limited to, the price at which our stockholders might be willing to participate in the Rights Offering, the value of the Warrant being issued as a component of the Unit, historical and current trading prices for our common stock, the amount of proceeds desired, the potential need for liquidity and capital, potential market conditions, and the desire to provide an opportunity to our shareholders to participate in the Rights Offering. In conjunction with its review of these factors, our pricing committee also reviewed a range of discounts to market value represented by the subscription prices in various prior Rights Offerings by other public companies. The Subscription Price does not necessarily bear any relationship to the book value of our assets, results of operations, cash flows, losses, financial condition or any other established criteria for value. You should not consider the Subscription Price as an indication of the fair value of our common stock. After the date of this prospectus, our common stock may trade at prices above or below the Subscription Price.

If you do not act on a timely basis and follow subscription instructions, your exercise of Subscription Rights may be rejected.

Holders of Subscription Rights who desire to purchase shares of our common stock and attached Warrants in this offering must act on a timely basis to ensure that all required forms and payments are actually received by the Subscription Agent prior to 5:00 PM Eastern Time, on the expiration date, unless extended. If you are a beneficial owner of shares of common stock and you wish to exercise your Subscription Rights, you must act promptly to ensure that your broker, dealer, custodian bank, trustee or other nominee acts for you and that all required forms and payments are actually received by your broker, dealer, custodian bank, trustee or other nominee in sufficient time to deliver such forms and payments to the Subscription Agent to exercise the Subscription Rights granted in this offering that you beneficially own prior to 5:00 PM Eastern Time on the expiration date, as may be extended. We will not be responsible if your broker, dealer, custodian bank, trustee or other nominee fails to ensure that all required forms and payments are actually received by the Subscription Agent prior to 5:00 PM Eastern Time, on the expiration date.

If you fail to complete and sign the required subscription forms, send an incorrect payment amount, or otherwise fail to follow the subscription procedures that apply to your exercise in this Rights Offering, the Subscription Agent may, depending on the circumstances, reject your subscription

or accept it only to the extent of the payment received. Neither we nor the Subscription Agent undertakes to contact you concerning an incomplete or incorrect subscription form or payment, nor are we under any obligation to correct such forms or payment. We have the sole discretion to determine whether a subscription exercise properly follows the subscription procedures.

You may not receive all of the Units for which you over-subscribe.

Holders who fully exercise their Basic Subscription Rights will be entitled to subscribe for an additional number of Units. Over-Subscription Privileges will be allocated pro rata among Rights holders who over-subscribed, based on the number of over-subscription Units to which they have subscribed. We cannot guarantee that you will receive any or the entire amount of Units for which you over-subscribed. If the prorated amount of Units allocated to you in connection with your Over-Subscription Privilege is less than your Over-Subscription Request, then the excess funds held by the Subscription Agent on your behalf will be returned to you, without interest, as soon as practicable after the Rights Offering has expired and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected, and we will have no further obligations to you.

The receipt of Subscription Rights may be treated as a taxable distribution to you.

We believe the distribution of the Subscription Rights in this Rights Offering should be a non-taxable distribution to holders of shares of common stock and the participating warrants under Section 305(a) of the Internal Revenue Code of 1986, as amended, or the "Code." Please see the discussion on the "Material U.S. Federal Income Tax Consequences" below. This position is not binding on the IRS, or the courts, however. If this Rights Offering is deemed to be part of a "disproportionate distribution" under Section 305 of the Code, your receipt of Subscription Rights in this offering may be treated as the receipt of a taxable distribution to you equal to the fair market value of the Subscription Rights. Any such distribution would be treated as dividend income to the extent of our current and accumulated earnings and profits, if any, with any excess being treated as a return of capital to the extent thereof and then as capital gain. Each holder of shares of common stock and each holder of a participating warrant is urged to consult his, her or its own tax advisor with respect to the particular tax consequences of this Rights Offering.

The Subscription Rights are not transferable, and there is no market for the Subscription Rights.

You may not sell, transfer, assign or give away your Subscription Rights. Because the Subscription Rights are non-transferable, there is no market or other means for you to directly realize any value associated with the Subscription Rights. You must exercise the Subscription Rights to realize any potential value from your Subscription Rights.

Absence of a public trading market for the Warrants may limit your ability to resell the Warrants.

There is no established trading market for the Warrants to be issued pursuant to this offering, and the Warrants may not be widely distributed. We have applied to list the Warrants for trading on NASDAQ under the symbol "ONTXW," but there can be no assurance that a sufficient number of Subscription Rights will be exercised so that the Warrants will meet minimum listing criteria to be accepted for listing on NASDAQ or that a market will develop for the Warrants. Even if a market for the Warrants does develop, the price of the Warrants may fluctuate and liquidity may be limited. If the Warrants are not accepted for listing on NASDAQ or if a market for the Warrants does not develop, then purchasers of the Warrants may be unable to resell the Warrants or sell them only at an unfavorable price for an extended period of time, if at all. Future trading prices of the Warrants will depend on many factors, including:

- our operating performance and financial condition;

- our ability to continue the effectiveness of the registration statement, of which this prospectus is a part, covering the Warrants and the common stock issuable upon exercise of the Warrants;
- the interest of securities dealers in making a market; and
- the market for similar securities.

There is no market for the Pre-Funded Warrants.

There is no established trading market for the Pre-Funded Warrants to be issued pursuant to this offering, if any, and the Pre-Funded Warrants will not be listed for trading on any stock exchange or market.

The market price of our common stock may never exceed the exercise price of the Warrants issued in connection with this offering.

The Warrants being issued in connection with this offering become exercisable upon issuance and will expire five years after issuance. We cannot provide you any assurance that the market price of our common stock will ever exceed the exercise price of the Warrants prior to their date of expiration. Any Warrants not exercised by their date of expiration will expire worthless and we will be under no further obligation to the Warrant holder.

The Warrants may be redeemed on short notice. This may have an adverse impact on their price.

After the one-year anniversary of issuance, we may redeem the Warrants for \$0.001 per Warrant once the closing price of our common stock has equaled or exceeded \$ _____ per share, 300% of the exercise price, subject to adjustment, for 10 consecutive trading days. If we give notice of redemption, you will be forced to sell or exercise your Warrants or accept the redemption price. The notice of redemption could come at a time when it is not advisable or possible for you to exercise the Warrants. As a result, you would be unable to benefit from owning the Warrants being redeemed.

The dealer-manager is not underwriting, nor acting as placement agent of, the Subscription Rights or the securities underlying the Subscription Rights.

Maxim Group LLC is acting as dealer-manager for this Rights Offering. Under the terms and subject to the conditions contained in the dealer-manager agreement, the dealer-manager will provide marketing assistance in connection with this offering. The dealer-manager is not underwriting or placing any of the Subscription Rights or the Units, shares of common stock or Warrants being issued in this offering, and does not make any recommendation with respect to such Subscription Rights (including with respect to the exercise or expiration of such Subscription Rights), Units, shares of common stock or Warrants. The dealer-manager will not be subject to any liability to us in rendering the services contemplated by the dealer-manager agreement except for any act of bad faith or gross negligence by the dealer-manager. The services of the dealer-manager to us in connection with this offering cannot be construed as any assurance that this offering will be successful.

Since the Warrants and Pre-Funded Warrants are executory contracts, they may have no value in a bankruptcy or reorganization proceeding.

In the event a bankruptcy or reorganization proceeding is commenced by or against us, a bankruptcy court may hold that any unexercised Warrants and Pre-Funded Warrants are executory contracts that are subject to rejection by us with the approval of the bankruptcy court. As a result, holders of the Warrants and Pre-Funded Warrants may, even if we have sufficient funds, not be entitled to receive any consideration for their Warrants and Pre-Funded Warrants or may receive an amount less than they would be entitled to if they had exercised their Warrants and Pre-Funded Warrants prior to the commencement of any such bankruptcy or reorganization proceeding.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus includes forward-looking statements. We may, in some cases, use terms such as "believes," "estimates," "anticipates," "expects," "plans," "intends," "may," "could," "might," "should," "approximately" or other words that convey uncertainty of future events or outcomes to identify these forward-looking statements. Forward-looking statements appear in a number of places throughout this report and include statements regarding our intentions, beliefs, projections, outlook, analyses or current expectations concerning, among other things, our ongoing and planned preclinical development and clinical trials, the timing of and our ability to make regulatory filings and obtain and maintain regulatory approvals for our product candidates, protection of our intellectual property portfolio, the degree of clinical utility of our products, particularly in specific patient populations, our ability to develop commercial and manufacturing functions, expectations regarding clinical trial data, our results of operations, cash needs, financial condition, liquidity, prospects, growth and strategies, the industry in which we operate and the trends that may affect the industry or us.

By their nature, forward-looking statements involve risks and uncertainties because they relate to events, competitive dynamics and industry change, and depend on the economic circumstances that may or may not occur in the future or may occur on longer or shorter timelines than anticipated. Although we believe that we have a reasonable basis for each forward-looking statement contained in this report, we caution you that forward-looking statements are not guarantees of future performance and that our actual results of operations, financial condition and liquidity, and the development of the industry in which we operate may differ materially from the forward-looking statements contained in this report. In addition, even if our results of operations, financial condition and liquidity, and events in the industry in which we operate are consistent with the forward-looking statements contained in this report, they may not be predictive of results or developments in future periods.

Actual results could differ materially from our forward-looking statements due to a number of factors, including risks related to:

- our need for additional financing for our INSPIRE trial and other operations, and our ability to obtain sufficient funds on acceptable terms when needed, and our plans and future needs to scale back operations if adequate financing is not obtained;
- our ability to continue as a going concern;
- our estimates regarding expenses, future revenues, capital requirements and needs for additional financing;
- the success and timing of our preclinical studies and clinical trials, including site initiation and patient enrollment, and regulatory approval of protocols for future clinical trials;
- our ability to enter into, maintain and perform collaboration agreements with other pharmaceutical companies, for funding and commercialization of our clinical drug candidates or preclinical compounds, and our ability to achieve certain milestones under those agreements;
- the difficulties in obtaining and maintaining regulatory approval of our product candidates, and the labeling under any approval we may obtain;
- our plans and ability to develop, manufacture and commercialize our product candidates;
- our failure to recruit or retain key scientific or management personnel or to retain our executive officers;
- the size and growth of the potential markets for our product candidates and our ability to serve those markets;
- regulatory developments in the United States and foreign countries;

- the rate and degree of market acceptance of any of our product candidates;
- obtaining and maintaining intellectual property protection for our product candidates and our proprietary technology;
- the successful development of our commercialization capabilities, including sales and marketing capabilities;
- recently enacted and future legislation and regulation regarding the healthcare system;
- the success of competing therapies and products that are or become available;
- our ability to maintain the listing of our common stock on a national securities exchange;
- the potential for third party disputes and litigation; and
- the performance of third parties, including contract research organizations, or CROs and third-party manufacturers.

Any forward-looking statements that we make in this prospectus speak only as of the date of such statement, and we undertake no obligation to update such statements to reflect events or circumstances after the date of this prospectus or to reflect the occurrence of unanticipated events. Comparisons of results for current and any prior periods are not intended to express any future trends or indications of future performance, unless expressed as such, and should only be viewed as historical data.

You should also read carefully the factors described in the "Risk Factors" in our annual report on Form 10-K filed with the SEC on March 28, 2016, to better understand significant risks and uncertainties inherent in our business and underlying any forward-looking statements. As a result of these factors, actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements in this report and you should not place undue reliance on any forward-looking statements.

USE OF PROCEEDS

Assuming that all 4,255,581 Units are sold in the Rights Offering and no elections to receive Pre-Funded Warrants are made, we estimate that the net proceeds from the Rights Offering will be approximately \$23.0 million, based on the midpoint of the expected Subscription Price range of \$6.00 per Unit, after deducting fees and expenses payable to the dealer-manager, and after deducting other expenses payable by us and excluding any proceeds received upon exercise of any Warrants issued in the Rights Offering.

We intend to use the net proceeds from this Rights Offering primarily to continue funding our ongoing Phase 3 clinical trial of rigosertib IV in a population of patients with higher-risk MDS after failure of HMA therapy, which we refer to as "INSPIRE," and, to a lesser extent, for other development of our clinical and preclinical programs, for other research and development activities, business development and for general corporate purposes, which may include capital expenditures and funding our working capital needs.

Our management will have broad discretion in the application of the net proceeds from this offering, and investors will be relying on the judgment of our management with regard to the use of these net proceeds. Pending the use of the net proceeds from this offering as described above, we intend to hold the net proceeds in cash or invest in short-term, investment-grade, interest-bearing instruments.

CAPITALIZATION

The following table presents our cash, cash equivalents and capitalization, as of March 31, 2016:

- on an actual basis; and
- on a pro forma as adjusted basis to give further effect to the sale by us in this Rights Offering of maximum of 4,255,581 Units (consisting of 4,255,581 shares of our common stock (assuming no Pre-Funded Warrants) and Warrants to purchase an aggregate of 3,191,686 shares of common stock upon exercise), at the assumed Subscription Price of \$6.00 per Unit (the midpoint of the expected range of \$5.75 and \$6.25 per Unit), and our receipt of the net proceeds from that sale after deducting estimated offering expenses.

The table below does not reflect the exercise of Warrants issued in connection with the Rights Offering. The pro forma as adjusted information set forth below assumes equity accounting for the Warrants, is illustrative only and will be adjusted based on the Units sold. You should read this information in conjunction with our consolidated financial statements and notes thereto incorporated by reference into this prospectus.

	March 31, 2016 (unaudited)	
	Actual	Pro Forma as Adjusted
Cash and cash equivalents	\$ 16,835,000	\$ 39,880,000
Long-term liabilities	5,181,000	5,181,000
Stockholders' equity*:		
Preferred stock, \$0.01 par value, 5,000,000 authorized at March 31, 2016 and March 31, 2016 Pro Forma, none issued and outstanding at March 31, 2016	—	—
Common stock, \$0.01 par value, 25,000,000 authorized at March 31, 2016 and March 31, 2016 Pro Forma as Adjusted, 2,740,212 shares issued and outstanding at March 31, 2016 and 6,995,793 shares issued and outstanding at March 31, 2016 Pro Forma as Adjusted	27,000	70,000
Additional paid-in capital	331,775,000	354,777,000
Accumulated other comprehensive loss	(16,000)	(16,000)
Accumulated deficit	(325,797,000)	(325,797,000)
Total Onconova Therapeutics, Inc. stockholders' equity	5,989,000	29,034,000
Non-controlling interest	830,000	830,000
Total stockholders' equity	6,819,000	29,864,000

* Stockholders' equity has been restated to reflect the one-for-ten reverse stock split and decrease in authorized common shares from 75,000,000 to 25,000,000.

The information above is as of March 31, 2016 and excludes:

- 567,122 shares of common stock issuable upon the exercise of stock options outstanding at March 31, 2016 with a weighted average exercise price of \$72.60 per share;
- 97,424 shares of common stock issuable upon the exercise of outstanding warrants at March 31, 2016 with a weighted average exercise price of \$12.05 per share;
- 185,909 shares of common stock reserved for future issuance under our 2013 Equity Compensation Plan at March 31, 2016; and

- any additional shares of common stock that we may issue to Lincoln Park Capital Fund, LLC, or Lincoln Park, pursuant to a purchase agreement we entered into on October 8, 2015, which provides that, upon the terms and subject to the conditions and limitation set forth therein, Lincoln Park is committed to purchase up to an aggregate of an additional \$15 million of shares of our common stock over the term of the purchase agreement, should we elect to sell shares to Lincoln Park.

All share and per share data has been restated to reflect our one-for-ten reverse stock split effective May 31, 2016, subject to final adjustments for treatment of fractional share interests.

DILUTION

Purchasers of our common stock in the Rights Offering (and upon exercise of the Warrants issued pursuant to this Rights Offering) will experience an immediate dilution of the net tangible book value per share of our common stock. Our net tangible book value as of March 31, 2016 was approximately \$6,819,000, or \$2.49 per share of our common stock (based upon 2,740,212 shares of our common stock outstanding after giving effect to the one-for-ten reverse stock split on May 31, 2016). Net tangible book value per share is equal to our total net tangible book value, which is our total tangible assets less our total liabilities, divided by the number of shares of our outstanding common stock. Dilution per share equals the difference between the amount per share paid by purchasers of shares of common stock in the Rights Offering and the net tangible book value per share of our common stock immediately after the Rights Offering.

Based on the sale by us in this Rights Offering of a maximum of 4,255,581 Units (consisting of 4,255,581 shares of our common stock (assuming no Pre-Funded Warrants) and Warrants to purchase an aggregate of 3,191,686 shares of common stock upon exercise), at the assumed Subscription Price of \$6.00 per Unit (the midpoint of the expected range of \$5.75 and \$6.25 per Unit), and after deducting estimated offering expenses and dealer-manager fees and expenses payable by us of \$2.5 million, and the application of the estimated \$23.0 million of net proceeds from the Rights Offering, assuming equity accounting for the Warrants, our pro forma net tangible book value as of March 31, 2016 would have been approximately \$29.9 million, or \$4.27 per share. This represents an immediate increase in pro forma net tangible book value to existing shareholders of \$1.78 per share and an immediate dilution to purchasers in the Rights Offering of \$1.73 per share.

The following table illustrates this per-share dilution on a pro forma basis, assuming a fully subscribed for Rights Offering of 4,255,581 Units at the assumed Subscription Price of \$6.00 per Unit (the midpoint of the expected range of \$5.75 and \$6.25 per Unit) (assuming no Pre-Funded Warrants and excluding any issuance of shares of common stock upon exercise of Warrants):

Subscription Price	\$ 6.00
Net tangible book value per share as of March 31, 2016, before Rights Offering	\$ 2.49
Increase in net tangible book value per share attributable to Rights Offering	\$ 1.78
Pro forma net tangible book value per share as of March 31, 2016, after giving effect to Rights Offering	\$ 4.27
Dilution in net tangible book value per share to purchasers	\$ 1.73

The information above is as of March 31, 2016 and excludes:

- 567,122 shares of common stock issuable upon the exercise of stock options outstanding at March 31, 2016 with a weighted average exercise price of \$72.60 per share;
- 97,424 shares of common stock issuable upon the exercise of outstanding warrants at March 31, 2016 with a weighted average exercise price of \$12.05 per share;

- 185,909 shares of common stock reserved for future issuance under our 2013 Equity Compensation Plan at March 31, 2016; and
- any additional shares of common stock that we may issue to Lincoln Park Capital Fund, LLC, or Lincoln Park, pursuant to a purchase agreement we entered into on October 8, 2015, which provides that, upon the terms and subject to the conditions and limitation set forth therein, Lincoln Park is committed to purchase up to an aggregate of an additional \$15 million of shares of our common stock over the term of the purchase agreement, should we elect to sell shares to Lincoln Park.

All share and per share data has been restated to reflect our one-for-ten reverse stock split effective May 31, 2016.

To the extent that outstanding options or warrants are exercised, the investor purchasing our common stock in this offering will experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations. To the extent that additional capital is raised through the sale of securities, the issuance of those securities could result in further dilution to our stockholders.

MARKET PRICE OF OUR COMMON STOCK AND RELATED STOCKHOLDER MATTERS

Our common stock began trading on the NASDAQ Global Select Market on July 25, 2013 under the symbol "ONTX." Prior to that time, there was no public market for our common stock. On February 5, 2016, we transferred the listing of our shares to the NASDAQ Capital Market. The following table sets forth for the periods indicated the high and low intra-day sale prices per share of our common stock as reported on the NASDAQ Global Market or NASDAQ Capital Market, as adjusted to give effect to our one-for-ten reverse stock split effective May 31, 2016:

	<u>High</u>	<u>Low</u>
<i>Year Ending December 31, 2016</i>		
First Quarter	\$ 10.28	\$ 3.23
Second Quarter (through June 28, 2016)	8.17	3.80
<i>Year Ended December 31, 2015</i>		
First Quarter	\$ 44.30	\$ 21.50
Second Quarter	30.20	22.60
Third Quarter	40.00	13.20
Fourth Quarter	18.90	9.20
<i>Year Ended December 31, 2014</i>		
First Quarter	\$ 162.20	60.50
Second Quarter	64.90	41.00
Third Quarter	57.80	42.40
Fourth Quarter	50.00	32.40

On June 28, 2016, the last reported sale price of our common stock on the NASDAQ Capital Market was \$6.00 per share. As of June 27, 2016, we had 138 holders of record of our common stock. The actual number of holders of common stock is greater than these numbers of record holders and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers and nominees. The number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

DIVIDEND POLICY

We have never declared or paid any cash dividends on our capital stock. We currently intend to retain all available funds and any future earnings to support our corporation and finance the growth and development of our business. We do not intend to pay cash dividends on our common stock for the foreseeable future.

THE RIGHTS OFFERING

The Subscription Rights

We are distributing to the record holders and to holders of certain outstanding warrants who are entitled to participate in this offering pursuant to the terms of such warrants, at no charge, non-transferable Subscription Rights to purchase one Unit at a subscription price per Unit to be determined. The Subscription Price per Unit is expected to be between \$5.75 and \$6.25. The exact Subscription Price per Unit will be determined by our board of directors or pricing committee prior to the effectiveness of the registration statement of which this prospectus is a part. Each Basic Subscription Right will entitle you to purchase one share of our common stock and 0.75 of a Warrant for the purchase of one additional share of our common stock at an exercise price of \$ per share, 120% of the per Unit price, from the date of issuance through its expiration on , 2021. Each record holder will receive 1.5 Subscription Rights for each whole share of our common stock owned by such record holder as of the Record Date. Each holder of an outstanding participating warrant will receive 1.5 Subscription Rights for each whole share of our common stock as if each of such participating warrants had been exercised immediately prior to the record date for the Rights Offering. Each Subscription Right entitles the record holder or holder of a participating warrant to a Basic Subscription Right and an Over-Subscription Privilege.

Basic Subscription Rights

Your Basic Subscription Rights will entitle you to purchase one share of our common stock and 0.75 of a Warrant to purchase one share of our common stock at the exercise price described elsewhere in this prospectus. For example, if you owned 100 shares of common stock as of the Record Date, you will receive 150 Subscription Rights and will have the right to purchase 150 shares of our common stock and Warrants to purchase 112 shares of our common stock for \$ per whole Unit, or a total payment of \$. You may exercise all or a portion of your Basic Subscription Rights, or you may choose not to exercise any of your Basic Subscription Rights. If you do not exercise your Basic Subscription Rights in full, you will not be entitled to exercise your Over-Subscription Privilege.

Over-Subscription Privilege

If you exercise your Basic Subscription Rights in full, you may also choose to exercise your Over-Subscription Privilege. Subject to proration, if applicable, we will seek to honor the Over-Subscription Privilege requests in full. If Over-Subscription Privilege requests exceed the number of Units available, however, we will allocate the available Units pro rata among the record holders and participating warrant holders exercising the Over-Subscription Privilege in proportion to the number of shares of our common stock each of those record holders owned or the number of shares underlying participating warrants held by each of those warrant holders on the Record Date, relative to the number of shares owned or underlying participating warrants on the Record Date by all record holders and warrant holders exercising the Over-Subscription Privilege. If this pro rata allocation results in any record holder or warrant holder receiving a greater number of Units than the record holder or warrant holder subscribed for pursuant to the exercise of the Over-Subscription Privilege, then such record holder or warrant holder will be allocated only that number of Units for which the record holder or warrant holder oversubscribed, and the remaining Units will be allocated among all other record holders and warrant holders exercising the Over-Subscription Privilege on the same pro rata basis described above. The proration process will be repeated until all Units have been allocated.

Wells Fargo Bank, N.A., the Subscription Agent for the Rights Offering, will determine the over-subscription allocation based on the formula described above.

To the extent the aggregate subscription payment of the actual number of unsubscribed Units available to you pursuant to the Over-Subscription Privilege is less than the amount you actually paid in connection with the exercise of the Over-Subscription Privilege, you will be allocated only the number of unsubscribed Units available to you, and any excess subscription payments will be returned to you, without interest or penalty, as soon as practicable after expiration of the Rights Offering.

We can provide no assurances that you will actually be entitled to purchase the number of Units issuable upon the exercise of your Over-Subscription Privilege in full at the expiration of the Rights Offering. We will not be able to satisfy any requests for Units pursuant to the Over-Subscription Privilege if all of our shareholders and participating warrant holders exercise their Basic Subscription Rights in full, and we will only honor an Over-Subscription Privilege to the extent sufficient Units are available following the exercise of Basic Subscription Rights.

Pre-Funded Warrants

If your subscription for Units in the Rights Offering may result in the your beneficial ownership of more than 4.99% of our outstanding common stock following the consummation of the Rights Offering, and you do not wish to exceed that ownership threshold, you may elect to receive a Pre-Funded Warrant to purchase one share of common stock in lieu of any share of common stock underlying the Units for which you have subscribed in excess of such threshold.

You may make an election to receive Pre-Funded Warrants in lieu of common stock, to the extent that your beneficial ownership would otherwise be above the ownership threshold. If you intend to do so, in addition to making your election on your Subscription Rights Statement, we ask that you contact the dealer-manager for the Rights Offering as follows:

Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745

If you make an election to receive Pre-Funded Warrants but fail to timely provide the required holder information for the issuance of any Pre-Funded Warrants, you may receive the shares of common stock underlying all of your subscribed Units.

Our Participating Warrant Holders

On January 11, 2016, we issued common stock purchase warrants to purchase up to 96,842 shares of our common stock at an exercise price equal to \$11.50 per share, subject to customary adjustments and as adjusted for our one-for-ten reverse stock split effective May 31, 2016. These warrants, referred to as our "participating warrants," entitle the holders to participate in this Rights Offering as if each of such participating warrants had been exercised immediately prior to the record date for the Rights Offering. As a result, holders of our participating warrants are receiving Subscription Rights for an aggregate of approximately 96,842 Units in connection with this Rights Offering; provided, however, to the extent that any warrant holder's right to participate in this Rights Offering would result in the holder exceeding the beneficial ownership limitation set forth in the participating warrants, then the holder will not be entitled to participate in this Rights Offering to such extent and the portion of this Rights Offering will be held in abeyance for the benefit of the holder until such time, if ever, as its right thereto would not result in the holder exceeding the applicable beneficial ownership limitation.

None of our other currently outstanding warrants is entitled to receive Subscription Rights in this offering.

Limitation on the Purchase of Units

You may only purchase the number of whole Units purchasable upon exercise of the number of Basic Subscription Rights distributed to you in the Rights Offering, plus the Over-Subscription Privilege, if any. Accordingly, the number of Units that you may purchase in the Rights Offering is limited by the number of shares of our common stock you held on the Record Date or the number of shares underlying your outstanding participating warrants and by the extent to which other shareholders and participating warrant holders exercise their Basic Subscription Rights and Over-Subscription Privileges, which we cannot determine prior to completion of the Rights Offering.

Subscription Price

The Subscription Price per Unit is expected to be between \$5.75 and \$6.25. The exact Subscription Price per Unit will be determined by our board of directors or pricing committee prior to the effectiveness of the registration statement of which this prospectus is a part. The Subscription Price does not necessarily bear any relationship to our past or expected future results of operations, cash flows, current financial condition, or any other established criteria for value. No change will be made to the Subscription Price by reason of changes in the trading price of our common stock or other factor prior to the expiration of this Rights Offering.

Determination of Subscription Price

In the determining the Subscription Price, the board of directors or pricing committee may consider a variety of factors including those listed below:

- our need to raise capital in the near term to continue our operations;
- the current and historical trading prices of our common stock;
- a price that would increase the likelihood of participation in the Rights Offering;
- the cost of capital from other sources;
- the value of the Warrant being issued as a component of the Unit;
- comparable precedent transactions, including the percentage of shares offered, the terms of the subscription rights being offered, the subscription price and the discount that the subscription price represents to the immediately prevailing closing prices for these offerings;
- an analysis of stock price trading multiples for companies similar to us that, among other things, did not need to raise capital in the near-term; and
- our most recently forecasted revenue relative to our peer group.

The Subscription Price does not necessarily bear any relationship to any established criteria for value. No valuation consultant or investment banker has opined upon the fairness or adequacy of the Subscription Price. You should not consider the Subscription Price as an indication of actual value of our company or our common stock. You should not assume or expect that, after the Rights Offering, our shares of common stock will trade at or above the Subscription Price in any given time period. The market price of our common stock may decline during or after the Rights Offering. We cannot assure you that you will be able to sell the shares of our common stock purchased during the Rights Offering at a price equal to or greater than the Subscription Price. You should obtain a current price quote for our common stock before exercising your Subscription Rights and make your own assessment of our

business and financial condition, our prospects for the future, and the terms of this Rights Offering. Once made, all exercises of Subscription Rights are irrevocable.

No Recombination

The common stock and Warrants comprising the Units will separate upon the effectiveness of the exercise of the Subscription Rights and will be issued as separate securities, and the Units will not trade as a separate security. Holders may not recombine shares of common stock and Warrants to receive a Unit.

Non-Transferability of Subscription Rights

The Subscription Rights are non-transferable (other than by operation of law) and, therefore, you may not sell, transfer, assign or give away your Subscription Rights to anyone. The Subscription Rights will not be listed for trading on any stock exchange or market.

Expiration Date; Extension

The subscription period, during which you may exercise your Subscription Rights, expires at 5:00 PM Eastern Time, on July 26, 2016, which is the expiration of the Rights Offering. If you do not exercise your Subscription Rights before that time, your Subscription Rights will expire and will no longer be exercisable. We will not be required to issue shares to you if the Subscription Agent receives your Subscription Rights Statement or your subscription payment after that time. We have the option to extend the Rights Offering in our sole discretion, although we do not presently intend to do so. We may extend the Rights Offering by giving oral or written notice to the Subscription Agent before the Rights Offering expires. If we elect to extend the Rights Offering, we will issue a press release announcing the extension no later than 9:00 AM Eastern Time, on the next business day after the most recently announced expiration date of the Rights Offering.

If you hold your shares of common stock in the name of a broker, dealer, custodian bank or other nominee, the nominee will exercise the Subscription Rights on your behalf in accordance with your instructions. Please note that the nominee may establish a deadline that may be before 5:00 PM Eastern Time, on July 26, 2016, which is the expiration date that we have established for the Rights Offering.

Termination

We may terminate the Rights Offering at any time and for any reason prior to the completion of the Rights Offering. If we terminate the Rights Offering, we will issue a press release notifying shareholders, warrant holders and the public of the termination.

Return of Funds upon Completion or Termination

The Subscription Agent will hold funds received in payment for shares in a segregated account pending completion of the Rights Offering. The Subscription Agent will hold this money until the Rights Offering is completed or is terminated. To the extent you properly exercise your Over-Subscription Privilege for an amount of Units that exceeds the number of unsubscribed Units available to you, any excess subscription payments will be returned to you as soon as practicable after the expiration of the Rights Offering, without interest or penalty. If the Rights Offering is terminated for any reason, all subscription payments received by the Subscription Agent will be returned as soon as practicable, without interest or penalty.

Shares of Our Common Stock Outstanding After the Rights Offering

After our one-for-ten reverse stock split on May 31, 2016, 2,740,212 shares of our common stock were outstanding, along with participating warrants to purchase 96,842 shares of common stock. Based on the foregoing, and assuming no other transactions by us involving our common stock prior to the expiration of the Rights Offering, and that no Pre-Funded Warrants are issued in lieu of common stock, if the Rights Offering is fully subscribed approximately 6,995,793 shares of our common stock will be issued and outstanding and Warrants to purchase approximately 3,191,686 additional shares of our common stock will be outstanding (excluding the currently outstanding warrants). The exact number of shares of common stock, Warrants and Pre-Funded Warrants that we will issue in this Rights Offering will depend on the number of Units that are subscribed for in the Rights Offering and the elections of eligible investors to receive Pre-Funded Warrants.

Methods for Exercising Subscription Rights

The exercise of Subscription Rights is irrevocable and may not be cancelled or modified. You may exercise your Subscription Rights as follows:

Subscription by Record Holders

If you are a shareholder of record or a holder of participating warrants, the number of Units you may purchase pursuant to your Subscription Rights in indicated on the enclosed Subscription Rights Statement. You may exercise your Subscription Rights by properly completing and executing the Subscription Rights Statement and forwarding it, together with your full payment, to the Subscription Agent at the address given below under "Subscription Agent," to be received before 5:00 PM Eastern Time, on July 26, 2016.

Subscription by Beneficial Owners

If you are a beneficial owner of shares of our common stock that are registered in the name of a broker, dealer, custodian bank, or other nominee, you will not receive a Subscription Rights Statement. Instead, we will issue one Subscription Right to such nominee record holder for all shares of our common stock held by such nominee at the Record Date. If you are not contacted by your nominee, you should promptly contact your nominee in order to subscribe for shares in the Rights Offering and follow the instructions provided by your nominee.

To properly exercise your Over-Subscription Privilege, you must deliver the subscription payment related to your Over-Subscription Privilege before the Rights Offering expires. Because we will not know the total number of unsubscribed Units before the Rights Offering expires, if you wish to maximize the number of shares you purchase pursuant to your Over-Subscription Privilege, you will need to deliver payment in an amount equal to the aggregate subscription payment for the maximum number of Units that you wish to purchase.

Payment Method

Payments must be made in full in U.S. currency by cashier's check or by wire transfer, and payable to "Wells Fargo Shareowner Services, as Subscription Agent for Onconova Therapeutics, Inc." You must timely pay the full subscription payment, including payment for the Over-Subscription Privilege, for the full number of Units of our common stock and Warrants you wish to acquire pursuant to the exercise of Subscription Rights by delivering a:

- cashier's check, drawn on a U.S. bank payable to "Wells Fargo Shareowner Services, as Subscription Agent for Onconova Therapeutics, Inc."; or

- wire transfer of immediately available funds directly to the account maintained by Wells Fargo Shareowner Services, as Subscription Agent, for purposes of accepting subscriptions in this Rights Offering at Wells Fargo Bank, N.A., ABA# 121000248, Credit: Stock Transfer Clearing Account # 000-10-67-899, for further credit to Onconova Therapeutics, Inc., and name of the Subscription Rights holder.

You should read the instruction letter accompanying the Subscription Rights Statement carefully and strictly follow it. **DO NOT SEND SUBSCRIPTION RIGHTS STATEMENTS OR PAYMENTS DIRECTLY TO US.** We will not consider your subscription received until the Subscription Agent has received delivery of a properly completed and duly executed Subscription Rights Statement and payment of the full subscription payment.

The method of delivery of Subscription Rights Statements and payment of the subscription payment to the Subscription Agent will be at the risk of the holders of Subscription Rights. If sent by mail, we recommend that you send those statements and payments by registered mail, properly insured, with return receipt requested, or by overnight courier, and that you allow a sufficient number of days to ensure delivery to the Subscription Agent before the Rights Offering expires.

Missing or Incomplete Subscription Forms or Payment

If you fail to complete and sign the Subscription Rights Statement or otherwise fail to follow the subscription procedures that apply to the exercise of your Subscription Rights before the Rights Offering expires, the Subscription Agent will reject your subscription or accept it to the extent of the payment received. Neither we nor our Subscription Agent undertakes any responsibility or action to contact you concerning an incomplete or incorrect subscription form, nor are we under any obligation to correct such forms. We have the sole discretion to determine whether a subscription exercise properly complies with the subscription procedures.

If you send a payment that is insufficient to purchase the number of shares you requested, or if the number of shares you requested is not specified in the forms, the payment received will be applied to exercise your Subscription Rights to the fullest extent possible based on the amount of the payment received. Any excess subscription payments received by the Subscription Agent will be returned, without interest or penalty, as soon as practicable following the expiration of the Rights Offering.

Issuance of common stock and Warrants

The shares of common stock and Warrants that are purchased in the Rights Offering as part of the Units will be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration (DRS) account statement from our transfer agent reflecting ownership of these securities if you are a holder of record of shares or warrants. If you hold your shares of common stock in the name of a custodian bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the securities you purchased in the Rights Offering.

Any Pre-Funded Warrants that are purchased in the Rights Offering will be issued in physical form.

Subscription Agent

The Subscription Agent for the Rights Offering is Wells Fargo Bank, N.A. The address to which Subscription Rights Statements and payments should be mailed or delivered by overnight courier is provided below. If sent by mail, we recommend that you send documents and payments by registered mail, properly insured, with return receipt requested, and that you allow a sufficient number of days to

ensure delivery to the Subscription Agent before the Rights Offering expires. Do not send or deliver these materials to us.

By Mail:

**Wells Fargo Bank, N.A.
Shareowner Services
Voluntary Corporate Actions
P.O. Box 64858
St. Paul, Minnesota 55164-0858**

By Hand or Overnight Courier:

**Wells Fargo Bank, N.A.
Shareowner Services
Voluntary Corporate Actions
1110 Centre Pointe Curve, Suite 101
Mendota Heights, Minnesota 55120**

If you deliver the Subscription Rights Statements in a manner different than that described in this prospectus, we may not honor the exercise of your Subscription Rights.

Dealer-Manager

You should direct any questions or requests for assistance concerning the method of subscribing for the shares of our common stock or for additional copies of this prospectus to the dealer-manager for the Rights Offering as follows:

**Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745**

No Fractional Shares

We will not issue fractional shares of common stock in the Rights Offering. Rights holders will only be entitled to purchase a number of Units representing a whole number of shares of common stock, rounded down to the nearest whole number of Units a holder would otherwise be entitled to purchase. Any excess subscription payments received by the Subscription Agent will be returned as soon as practicable after expiration of the Rights Offering, without interest or penalty. Similarly, no fractional shares of common stock will be issued in connection with the exercise of a Warrant or Pre-Funded Warrant. If, upon exercise of a Warrant, the holder thereof would be entitled to receive a fractional share of common stock, upon exercise, the holder will only be entitled to receive a whole number of shares of common stock, rounded down to the nearest whole number.

Notice to Brokers and Nominees

If you are a broker, dealer, bank, or other nominee holder that holds shares of our common stock for the account of others on the Record Date, you should notify the beneficial owners of the shares for whom you are the nominee of the Rights Offering as soon as possible to learn their intentions with respect to exercising their Subscription Rights. If a beneficial owner of our common stock so instructs, you should complete the Subscription Rights Statement and submit it to the Subscription Agent with the proper subscription payment by the expiration date. You may exercise the number of Subscription

Rights to which all beneficial owners in the aggregate otherwise would have been entitled had they been direct holders of our common stock on the Record Date, provided that you, as a nominee record holder, make a proper showing to the Subscription Agent by submitting the form entitled "Nominee Holder Certification," which is provided with your Rights Offering materials. If you did not receive this form, you should contact our Subscription Agent to request a copy.

Validity of Subscriptions

We will resolve all questions regarding the validity and form of the exercise of your Subscription Rights, including time of receipt and eligibility to participate in the Rights Offering. Our determination will be final and binding. Once made, subscriptions are irrevocable; we will not accept any alternative, conditional, or contingent subscriptions. We reserve the absolute right to reject any subscriptions not properly submitted or the acceptance of which would be unlawful. You must resolve any irregularities in connection with your subscriptions before the expiration date of the Rights Offering, unless we waive them in our sole discretion. Neither we nor the Subscription Agent is under any duty to notify you or your representative of defects in your subscriptions. A subscription will be considered accepted, subject to our right to withdraw or terminate the Rights Offering, only when the Subscription Agent receives a properly completed and duly executed Subscription Rights Statement and any other required documents and the full subscription payment. Our interpretations of the terms and conditions of the Rights Offering will be final and binding.

Stockholder Rights

You will have no rights as a holder of the shares of our common stock you purchase in the Rights Offering until shares are issued in book-entry form or your account at your broker, dealer, bank, or other nominee is credited with the shares of our common stock purchased in the Rights Offering. Holders of Warrants issued in connection with the Rights Offering will not have rights as holders of our common stock until such Warrants are exercised and the shares of common stock underlying the Warrants are issued to the holder.

Foreign Shareholders

We will not mail this prospectus or Subscription Rights Statements to shareholders with addresses that are outside the United States or that have an army post office or foreign post office address. The Subscription Agent will hold these Subscription Rights Statements for their account. To exercise Subscription Rights, our foreign shareholders must notify the Subscription Agent prior 5:00 PM Eastern Time, on July 26, 2016, the third business day prior to the expiration date, of your exercise of Subscription Rights and provide evidence satisfactory to us, such as a legal opinion from local counsel, that the exercise of such Subscription Rights does not violate the laws of the jurisdiction in which such shareholder resides and payment by a U.S. bank in U.S. dollars before the expiration of the offer. If no notice is received by such time or the evidence presented is not satisfactory to us, the Subscription Rights represented thereby will expire.

No Revocation or Change

Once you submit the Subscription Rights Statement or have instructed your nominee of your subscription request, you are not allowed to revoke or change the exercise or request a refund of monies paid. All exercises of Subscription Rights are irrevocable, even if you learn information about us that you consider to be unfavorable. You should not exercise your Subscription Rights unless you are certain that you wish to purchase shares at the Subscription Price.

U.S. Federal Income Tax Treatment of Rights Distribution

For U.S. federal income tax purposes, we do not believe holders of shares of our common stock or warrants should recognize income or loss upon receipt or exercise of a Subscription Right. See "Material U.S. Federal Income Tax Consequences."

No Recommendation to Rights Holders

Our board of directors is not making a recommendation regarding your exercise of the Subscription Rights. Stockholders who exercise Subscription Rights risk investment loss on money invested. We cannot assure you that the market price of our common stock will reach or exceed the Subscription Price, and even if it does so, that it will not decline during or after the Rights Offering. We also cannot assure you that you will be able to sell shares of our common stock or Warrants purchased in the Rights Offering at a price equal to or greater than the Subscription Price. You should make your investment decision based on your assessment of our business and financial condition, our prospects for the future and the terms of this Rights Offering. Please see "Risk Factors" for a discussion of some of the risks involved in investing in our common stock.

Fees and Expenses

We will pay all fees charged by the Subscription Agent and by the dealer-manager. You are responsible for paying any other commissions, fees, taxes or other expenses incurred in connection with the exercise of your Subscription Rights.

Listing

The Subscription Rights may not be sold, transferred, assigned or given away to anyone, and will not be listed for trading on any stock exchange or market. We have applied to have the Warrants listed for trading on NASDAQ under the symbol "ONTXW," however, there is no assurance that a sufficient number of Subscription Rights will be exercised so that the Warrants will meet the minimum listing criteria to be accepted for listing on NASDAQ. The shares of our common stock, including the shares to be issued in the Rights Offering and the shares underlying the Warrants and any Pre-Funded Warrants to be issued in the Rights Offering, are traded on NASDAQ under the symbol "ONTX." The Pre-Funded Warrants will not be listed for trading on any stock exchange or market.

Important

Do not send Subscription Rights Statements directly to us. You are responsible for choosing the payment and delivery method for your Subscription Rights Statement and you bear the risks associated with such delivery. If you choose to deliver your Subscription Rights Statement and payment by mail, we recommend that you use registered mail, properly insured, with return receipt requested. We also recommend that you allow a sufficient number of days to ensure delivery to the Subscription Agent prior to the expiration time.

Distribution Arrangements

Maxim Group LLC is the dealer-manager for the Rights Offering. The dealer-manager will provide marketing assistance and advice to us in connection with the Rights Offering and will use its best efforts to solicit the exercise of Subscription Rights and participation in the Over-Subscription Privilege. The dealer-manager is not underwriting or placing any of the Subscription Rights or the Units, shares of common stock or Warrants to be issued in the Rights Offering, and does not make any recommendation with respect to such Subscription Rights (including with respect to the exercise or expiration of such Subscription Rights), Units, shares of common stock or Warrants. We have agreed to pay the dealer-manager certain fees and to reimburse the dealer-manager for certain out-of-pocket expenses incurred in connection with this offering. See "Plan of Distribution" for a discussion of the fees and expenses to be paid to the dealer-manager in connection with this Rights Offering.

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES

The following discussion is a summary of material U.S. federal income tax consequences relating to the receipt and exercise (or expiration) of the Subscription Rights acquired through the Rights Offering and the ownership and disposition of shares of our common stock and Warrants received upon exercise of the Subscription Rights, Pre-Funded Warrants or Warrants.

This summary deals only with Subscription Rights acquired through the Rights Offering, shares of our common stock, Pre-Funded Warrants and Warrants acquired upon exercise of Subscription Rights and shares of our common stock acquired upon exercise of the Pre-Funded Warrants or Warrants, in each case, that are held as capital assets by a beneficial owner. This discussion does not address all aspects of U.S. federal income taxation that may be relevant to such a beneficial owner in light of their personal circumstances, including the alternative minimum tax and the Medicare contribution tax on investment income. This discussion also does not address tax consequences to holders that may be subject to special tax rules, including, without limitation, insurance companies, real estate investment trusts, regulated investment companies, grantor trusts, tax-exempt organizations, employee stock purchase plans, partnerships and other pass-through entities, persons holding Subscription Rights, shares of our common stock, participating warrants, Pre-Funded Warrants or Warrants as part of a hedging, integrated, conversion or constructive sale transaction or a straddle, financial institutions, brokers, dealers in securities or currencies, traders that elect to mark-to-market their securities, persons that acquired Subscription Rights, shares of our common stock, participating warrants, Pre-Funded Warrants or Warrants in connection with employment or other performance of services, U.S. Holders (as defined below) that have a functional currency other than the U.S. dollar, U.S. expatriates, and certain former citizens or residents of the United States. In addition, the discussion does not describe any tax consequences arising out of the tax laws of any state, local or foreign jurisdiction, or any U.S. federal tax considerations other than income taxation (such as estate, generation skipping or gift taxation).

The discussion below is based upon the provisions of the Internal Revenue Code of 1986, as amended, or the Code, the United States Treasury regulations promulgated thereunder, rulings and judicial decisions, as of the date hereof, and such authorities may be repealed, revoked or modified, perhaps retroactively. We have not sought, and will not seek, any rulings from the Internal Revenue Service, or the IRS, regarding the matters discussed below. There can be no assurance that the IRS or a court (if the matter were contested) will not take positions concerning the tax consequences of the receipt of Subscription Rights acquired through the Rights Offering by persons holding shares of our common stock or participating warrants, the exercise (or expiration) of the Subscription Rights, the acquisition, ownership and disposition of shares of our common stock and the acquisition, ownership and disposition (or expiration) of Pre-Funded Warrants or Warrants acquired upon exercise of the Subscription Rights that are different from those discussed below.

As used herein, a "U.S. Holder" means a beneficial owner of shares of our common stock, participating warrants, Subscription Rights, shares of our common stock, Pre-Funded Warrants and Warrants acquired upon exercise of Subscription Rights or shares of our common stock acquired upon exercise of Pre-Funded Warrants or Warrants, as the case may be, that is for U.S. federal income tax purposes: (1) an individual who is a citizen or resident of the United States; (2) 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 any state thereof or the District of Columbia; (3) an estate the income of which is subject to U.S. federal income taxation regardless of its source; or (4) a trust (a) the administration of which is subject to the primary supervision of a court within the United States and one or more United States persons as described in Section 7701(a)(30) of the Code have authority to control all substantial decisions of the trust or (b) that has a valid election under the Treasury Regulations in effect to be treated as a United States person. A "Non-U.S. Holder" is such a beneficial

owner (other than an entity or arrangement that is treated as a partnership for U.S. federal income tax purposes) that is not a U.S. Holder.

If any entity or arrangement that is treated as a partnership for U.S. federal income tax purposes is the record owner, the U.S. federal income tax treatment of a partner generally will depend upon the status of the partner and the activities of the partnership. Holders that are partnerships (and partners in such partnerships) are urged to consult their own tax advisors.

HOLDERS OF SHARES OF OUR COMMON STOCK AND PARTICIPATING WARRANTS SHOULD CONSULT THEIR OWN TAX ADVISORS REGARDING THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AND THE CONSEQUENCES UNDER FEDERAL ESTATE AND GIFT TAX LAWS, FOREIGN, STATE AND LOCAL LAWS AND TAX TREATIES OF THE RECEIPT, OWNERSHIP AND EXERCISE OF SUBSCRIPTION RIGHTS AND THE ACQUISITION, OWNERSHIP AND DISPOSITION OF SHARES OF OUR COMMON STOCK, PRE-FUNDED WARRANTS AND WARRANTS ACQUIRED UPON EXERCISE OF SUBSCRIPTION RIGHTS AND SHARES OF OUR COMMON STOCK ACQUIRED UPON EXERCISE OF PRE-FUNDED WARRANTS OR WARRANTS.

Tax Treatment of Pre-Funded Warrants

Any person that elects to receive Pre-Funded Warrants in lieu of our common stock upon the exercise of Subscription Rights should consult their own tax advisor regarding the application of the U.S. federal income tax laws to their particular situation.

Tax Consequences to U.S. Holders

Taxation of Subscription Rights

Receipt of Subscription Rights

Although the authorities governing transactions such as this Rights Offering are complex and do not speak directly to the consequences of certain aspects of this Rights Offering, including the inclusion of the right to purchase Pre-Funded Warrants and Warrants in the Subscription Rights (rather than the right to purchase only shares of our common stock), the distribution of Subscription Rights to participating warrant holders and the effects of the Over-Subscription Privilege, we do not believe your receipt of Subscription Rights pursuant to the Rights Offering should be treated as a taxable distribution with respect to your existing shares of common stock or participating warrants for U.S. federal income tax purposes. Pursuant to Section 305(a) of the Code, in general, the receipt by a shareholder or a participating warrant holder of a right to acquire stock or warrants should not be included in the taxable income of the recipient. The general rule of non-recognition in Section 305(a) is subject to exceptions in Section 305(b), which include "disproportionate distributions." A disproportionate distribution is a distribution or a series of distributions, including deemed distributions, that has the effect of the receipt of cash or other property by some shareholders and an increase in the proportionate interest of other shareholders in a corporation's assets or earnings and profits. During the last 36 months, we have not made any distributions of cash or non-stock property with respect to: (i) our common stock or (ii) our options or warrants to acquire common stock. Currently we do not intend to make any future distributions of cash or non-stock property with respect to: (i) our common stock or (ii) our options or warrants to acquire common stock; however, there is no guarantee that we will not make such distributions in the future.

Our position regarding the tax-free treatment of the Subscription Rights distribution is not binding on the IRS or the courts. If this position is finally determined by the IRS or a court to be incorrect, whether on the basis that the issuance of the Subscription Rights is a "disproportionate distribution" or

otherwise, the fair market value of the Subscription Rights would be taxable to holders of our common stock as a dividend to the extent of the holder's pro rata share of our current and accumulated earnings and profits, if any, with any excess being treated as a return of capital to the extent thereof and then as capital gain. Although no assurance can be given, it is anticipated that we will not have current and accumulated earnings and profits through the end of 2016. Further, if our position is incorrect, the treatment of holders of participating warrants may differ from the treatment of the Subscription Rights distribution to the holders of our common stock. The participating warrant holders may be treated in a manner similar to holders of our common stock but it is possible that they may be subject to different and adverse U.S. federal income tax consequences.

The following discussion is based upon the treatment of the Subscription Rights issuance as a non-taxable distribution with respect to your existing shares of common stock or participating warrants for U.S. federal income tax purposes.

Tax Basis in the Subscription Rights

If the fair market value of the Subscription Rights you receive is less than 15% of the fair market value of your existing shares of common stock or participating warrants (with respect to which the Subscription Rights are distributed) on the date you receive the Subscription Rights, the Subscription Rights will be allocated a zero dollar basis for U.S. federal income tax purposes, unless you elect to allocate your basis in your existing shares of common stock or participating warrants between your existing shares of common stock or participating warrants and the Subscription Rights in proportion to the relative fair market values of the existing shares of common stock or participating warrants and the Subscription Rights, determined on the date of receipt of the Subscription Rights. If you choose to allocate basis between your existing common shares or participating warrants and the Subscription Rights, you must make this election on a statement included with your timely filed tax return (including extensions) for the taxable year in which you receive the Subscription Rights. Such an election is irrevocable.

However, if the fair market value of the Subscription Rights you receive is 15% or more of the fair market value of your existing shares of common stock or participating warrants on the date you receive the Subscription Rights, then you must allocate your basis in your existing shares of common stock or participating warrants between those shares or participating warrants and the Subscription Rights you receive in proportion to their fair market values determined on the date you receive the Subscription Rights.

The fair market value of the Subscription Rights on the date that the Subscription Rights are distributed is uncertain, and we have not obtained, and do not intend to obtain, an appraisal of the fair market value of the Subscription Rights on that date. In determining the fair market value of the Subscription Rights, you should consider all relevant facts and circumstances, including any difference between the Subscription Price of the Subscription Rights and the trading price of our shares of common stock on the date that the Subscription Rights are distributed, the exercise price of the Warrants, the length of the period during which the Subscription Rights may be exercised and the fact that the Subscription Rights are non-transferable.

Exercise of Subscription Rights

Generally, you will not recognize gain or loss upon the effectiveness of the exercise of a Subscription Right in the Rights Offering. Your adjusted tax basis, if any, in the Subscription Right plus the Subscription Price should be allocated between the new common stock and Warrant acquired upon exercise of the Subscription Right. The basis in the stock or participating warrants upon which the Subscriptions Rights were issued which is allocated to the Subscription Rights under the prior section entitled "Tax Basis in the Subscription Rights" would be further allocated between the new common

stock and the Warrant acquired upon exercise of the Subscription Right in proportion to their relative fair market values on the date the Subscription Rights were distributed. The Subscription Price should be allocated between the new common stock and Warrant acquired upon exercise of the Subscription Right in proportion to their relative fair market values on the exercise date. These allocations will establish your initial tax basis for U.S. federal income tax purposes in your new common stock and Warrants. The holding period of shares of common stock or a Warrant acquired upon exercise of a Subscription Right in the Rights Offering will begin on the date of exercise.

If you exercise a Subscription Right received in the Rights Offering after disposing of the shares of our common stock or participating warrants with respect to which such Subscription Right is received, then certain aspects of the tax treatment of the exercise of the Subscription Right are unclear, including (1) the allocation of the tax basis between the shares of common stock or participating warrants previously sold and the Subscription Right, (2) the impact of such allocation on the amount and timing of gain or loss recognized with respect to the shares of our common stock or participating warrants previously sold and (3) the impact of such allocation on the tax basis of the shares of our common stock and Warrants acquired upon exercise of the Subscription Right. If you exercise a Subscription Right received in the Rights Offering after disposing of shares of our common stock or participating warrants with respect to which the Subscription Right is received, you should consult with your own tax advisor.

Expiration of Subscription Rights

If you allow Subscription Rights received in the Rights Offering to expire, you should not recognize any gain or loss for U.S. federal income tax purposes, and you should re-allocate any portion of the tax basis in your existing common stock or participating warrants previously allocated to the Subscription Rights that have expired to the existing common stock or participating warrants.

Taxation of Warrants

Sale, Exchange, Redemption or other Taxable Disposition of Warrants

Upon the sale, exchange, redemption or other taxable disposition of a Warrant, in general, you will recognize taxable gain or loss measured by the difference, if any, between (i) the amount of cash and the fair market value of any property received upon such taxable disposition and (ii) your adjusted tax basis in the Warrant as determined pursuant to the rules discussed above. Your gain or loss generally will be capital gain or loss and generally will be long-term capital gain or loss if, at the time of the sale or other disposition, your holding period for the Warrant is more than one year. The deductibility of capital losses is subject to limitations.

Exercise of Warrants

Upon the exercise of a Warrant by paying the exercise price in cash, in general, you will not recognize gain or loss for U.S. federal income tax purposes, except to the extent you receive a cash payment for any such fractional share that would otherwise have been issuable upon exercise of the Warrant. Your initial tax basis in common stock received will equal your adjusted tax basis in the Warrant exercised (as determined pursuant to the rules discussed above), increased by the amount of cash paid to exercise the Warrant and decreased by the adjusted tax basis allocable to any fractional share that would otherwise have been issuable upon exercise of the Warrant. Your holding period for the shares of our common stock received on exercise generally will commence on the day of exercise.

In certain circumstances, namely during any period when a registration statement for the exercise of the Warrants is not in effect, the Warrants will be exercisable on a cashless basis. The tax consequences of a cashless exercise are not clear and could differ from the consequences described

above, including the possibility that a cashless exercise could be a taxable event. You should consult your own tax advisor regarding the tax consequences of a cashless exercise of a Warrant.

Expiration of Warrants

If you allow a Warrant to expire, you will generally recognize a loss for U.S. federal income tax purposes equal to your adjusted tax basis in the Warrant. In general, such a loss will be a capital loss and will be a short-term or long-term capital loss depending on your holding period for the Warrant.

Certain Adjustments to the Warrants

Under Section 305 of the Code, an adjustment to the number of common shares that will be issued on the exercise of the Warrants, or an adjustment to the exercise price of the Warrants, may be treated as a constructive distribution to you if, and to the extent that, such adjustment has the effect of increasing your proportionate interest in our earnings and profits or assets, depending on the circumstances of such adjustment (for example, if such adjustment is to compensate for a distribution of cash or other property to our shareholders). Adjustments to the exercise price of Warrants made pursuant to a bona fide reasonable adjustment formula that has the effect of preventing dilution of the interest of the holders of the Warrants should generally not be considered to result in a constructive distribution. Any such constructive distribution would be taxable whether or not there is an actual distribution of cash or other property. See the more detailed discussion of the rules applicable to distributions made by us under the heading "Taxation of Common Stock—Distributions" below.

Taxation of Common Stock

Distributions

Distributions with respect to shares of our common stock acquired upon exercise of Subscription Rights or upon exercise of Warrants will be taxable as dividend income when actually or constructively received to the extent of our current or accumulated earnings and profits as determined for U.S. federal income tax purposes.

Dividend income received by certain non-corporate U.S. Holders with respect to shares of our common stock generally will be "qualified dividends" subject to preferential rates of U.S. federal income tax, provided that the U.S. Holder meets applicable holding period and other requirements. Subject to similar exceptions for short-term and hedged positions, dividend income on our shares of common stock paid to U.S. Holders that are domestic corporations generally will qualify for the dividends-received deduction. To the extent that the amount of a distribution exceeds our current and accumulated earnings and profits, such distribution will be treated first as a tax-free return of capital to the extent of your adjusted tax basis in such shares of our common stock and thereafter as capital gain.

Dispositions

If you sell or otherwise dispose of shares of common stock acquired upon exercise of Subscription Rights or upon exercise of Warrants in a taxable transaction, you will generally recognize capital gain or loss equal to the difference between the amount realized and your adjusted tax basis in the shares. Such capital gain or loss will be long-term capital gain or loss if your holding period for such shares is more than one year at the time of disposition. Long-term capital gain of a non-corporate U.S. Holder is generally taxed at preferential rates of U.S. federal income tax. The deductibility of capital losses is subject to limitations.

Information Reporting and Backup Withholding

You may be subject to information reporting and/or backup withholding with respect to the gross proceeds from the disposition of Warrants, shares of our common stock acquired through the exercise of Subscription Rights or through the exercise of Warrants, or dividend payments. Backup withholding (currently at the rate of 28%) may apply under certain circumstances if you (1) fail to furnish your social security or other taxpayer identification number, or TIN, (2) furnish an incorrect TIN, (3) fail to report interest or dividends properly or (4) fail to provide a certified statement, signed under penalty of perjury, that the TIN provided is correct, that you are not subject to backup withholding and that you are a U.S. person for U.S. federal income tax purposes on IRS Form W-9. Any amount withheld from a payment under the backup withholding rules is allowable as a credit against (and may entitle you to a refund with respect to) your U.S. federal income tax liability, provided that the required information is timely furnished to the IRS. Certain persons are exempt from information reporting and backup withholding, including corporations and certain financial institutions, provided that they demonstrate this fact, if requested. You are urged to consult your own tax advisor as to your qualification for exemption from backup withholding and the procedure for obtaining such exemption.

Tax Consequences to Non-U.S. Holders

Taxation of the Subscription Rights

Receipt, Exercise and Expiration of the Subscription Rights

The discussion assumes that the receipt of Subscription Rights will be treated as a non-taxable distribution. See "Tax Consequences to U.S. Holders—Taxation of Subscription Rights—Receipt of Subscription Rights" above.

Exercise and Expiration of Warrants and Certain Adjustments to Warrants

Exercise of Warrants

In general, a Non-U.S. Holder will not recognize gain or loss for U.S. federal income tax purposes upon exercise of a Warrant, except to the extent the Non-U.S. Holder receives a cash payment for any such fractional share that would otherwise have been issuable upon exercise of the Warrant, which will be treated as a sale subject to the rules described under "Sale or Other Disposition of Common Stock or Warrants" below.

Expiration of Warrants

In general, a Non-U.S. Holder will not be able to utilize a loss recognized upon expiration of a Warrant against the Non-U.S. Holder's U.S. federal income tax liability unless the loss is effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States (and, if an income tax treaty so provides, is attributable to a permanent establishment in the United States) or is treated as a U.S.-source loss and the Non-U.S. Holder is present 183 days or more in the taxable year of disposition and certain other conditions are met.

Certain Adjustments to the Warrants

Under Section 305 of the Code, an adjustment to the number of common shares that will be issued on the exercise of the Warrants, or an adjustment to the exercise price of the Warrants, may be treated as a constructive distribution to a Non-U.S. Holder of the Warrants if, and to the extent that, such adjustment has the effect of increasing such Non-U.S. Holder's proportionate interest in our "earnings and profits" or assets, depending on the circumstances of such adjustment (for example, if such adjustment is to compensate for a distribution of cash or other property to our shareholders). Adjustments to the exercise price of Warrants made pursuant to a bona fide reasonable adjustment

formula that has the effect of preventing dilution of the interest of the holders of the Warrants should generally not be considered to result in a constructive distribution. Any such constructive distribution would be taxable whether or not there is an actual distribution of cash or other property. See the more detailed discussion of the rules applicable to distributions made by us under the heading "—Taxation of Distributions on Common Stock" below.

Taxation of Distributions on Common Stock

Any distributions of cash or property (including any adjustments to the Warrants described in the immediately preceding paragraph) made with respect to our common stock generally will be subject to withholding tax to the extent paid out of our current or accumulated earnings and profits as determined for U.S. federal income tax purposes, if any, at a rate of 30% (or a lower rate prescribed by an applicable income tax treaty). In order to obtain a reduced withholding tax rate, if applicable, you will be required to provide a properly completed IRS Form W-8BEN or IRS Form W-8BEN-E, as applicable, certifying your entitlement to benefits under a treaty. In addition, you will not be subject to withholding tax if you provide an IRS Form W-8ECI certifying that the distributions are effectively connected with your conduct of a trade or business within the United States (and, if an applicable income tax treaty so provides, are attributable to a permanent establishment within the United States); instead, you generally will be subject to U.S. federal income tax, net of certain deductions, with respect to such income at the same rates applicable to U.S. persons. If you are a corporation, a "branch profits tax" of 30% (or a lower rate prescribed by an applicable income tax treaty) also may apply to such effectively connected income.

Non-U.S. Holders may be required to periodically update their IRS Forms W-8.

Any distribution will also be subject to the discussion below under the heading "FATCA."

Sale or Other Disposition of Our Common Stock or Warrants

Subject to the discussion below regarding backup withholding and FATCA, you generally will not be subject to U.S. federal income tax on any gain realized on a sale or other disposition of shares of our common stock or Warrants unless:

- the gain is effectively connected with your conduct of a trade or business within the United States (and, if an applicable income tax treaty so provides, is attributable to a permanent establishment in the United States);
- you are an individual, you hold your Subscription Rights, shares of common stock or Warrants as capital assets, you are present in the United States for 183 days or more in the taxable year of disposition and certain other conditions are met (in which case you will be subject to a 30% tax, or such lower rate as may be specified by an applicable income tax treaty, on the net gain derived from the disposition, which may be offset by your U.S.-source capital losses, if any); or
- we are or have been a "United States real property holding corporation," or USRPHC, for U.S. federal income tax purposes unless an exception for 5% or less shareholders applies.

Gain that is effectively connected with your conduct of a trade or business within the United States (and, if an applicable income tax treaty so provides, is attributable to a permanent establishment within the United States) generally will be subject to U.S. federal income tax, net of certain deductions, at the same rates applicable to U.S. persons. If you are a corporation, a "branch profits tax" of 30% (or a lower rate prescribed in an applicable income tax treaty) also may apply to such effectively connected gain.

A domestic corporation is treated as a USRPHC if the fair market value of its United States real property interests equals or exceeds 50% of the sum of (1) the fair market value of its United States

real property interests, (2) the fair market value of its non-United States real property interests and (3) the fair market value of any other of its assets which are used or held for use in a trade or business. We believe that we are not currently, and have not been within the relevant testing period, a USRPHC. However, no assurance can be given that we will not become a USRPHC in the future. If we are a USRPHC or become a USRPHC in the future, a Non-U.S. Holder may still not be subject to U.S. federal income tax on a sale or other disposition if an exception for 5% or less shareholders applies. You are urged to consult your own tax advisor regarding the U.S. federal income tax considerations that could result if we are, or become, a USRPHC and with respect to the exception for 5% or less shareholders.

Information Reporting and Backup Withholding

Distributions on our common stock and the amount of tax withheld, if any, with respect to such distributions will generally be subject to information reporting. If you comply with certification procedures to establish that you are not a United States person, additional information reporting and backup withholding should not generally apply to distributions on our common stock and information reporting and backup withholding should not generally apply to the proceeds from a sale or other disposition of Warrants or shares of our common stock. Generally, a Non-U.S. Holder will comply with such procedures if it provides a properly executed IRS Form W-8BEN or W-8BEN-E, as applicable, (or other applicable IRS Form W-8) or otherwise meets documentary evidence requirements for establishing that it is a Non-U.S. Holder, or otherwise establishes an exemption. The amount of any backup withholding will generally be allowed as a refund or credit against your U.S. federal income tax liability, provided that the required information is timely furnished to the IRS.

FATCA

Payments of dividends on our common stock to a Non-U.S. Holder will be subject to a 30% withholding tax if the Non-U.S. Holder fails to provide the withholding agent with documentation sufficient to show that it is compliant with FATCA. Generally such documentation is provided on an executed and properly completed IRS Form W-8BEN or IRS Form W-8BEN-E, as applicable. If dividends are subject to the 30% withholding tax under FATCA, they will not be subject to the 30% withholding tax described above under "Tax Consequences to Non-U.S. Holders—Taxation of Distributions on Common Stock." Starting in 2019, payments of the gross proceeds from a sale or exchange of our common stock or other securities may also be subject to FATCA withholding absent proof of FATCA compliance prior to January 1, 2019.

THE PRECEDING DISCUSSION OF MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES IS NOT TAX ADVICE. HOLDERS OF SUBSCRIPTION RIGHTS, SHARES OF OUR COMMON STOCK AND PARTICIPATING WARRANTS SHOULD CONSULT THEIR OWN TAX ADVISORS REGARDING THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AND THE CONSEQUENCES UNDER FEDERAL ESTATE AND GIFT TAX LAWS, FOREIGN, STATE AND LOCAL LAWS AND TAX TREATIES OF THE RECEIPT, OWNERSHIP AND EXERCISE OF SUBSCRIPTION RIGHTS AND THE ACQUISITION, OWNERSHIP AND DISPOSITION OF SHARES OF OUR COMMON STOCK, PRE-FUNDED WARRANTS AND WARRANTS ACQUIRED UPON EXERCISE OF SUBSCRIPTION RIGHTS AND SHARES OF OUR COMMON STOCK ACQUIRED UPON EXERCISE OF PRE-FUNDED WARRANTS OR WARRANTS.

DESCRIPTION OF SECURITIES

Our authorized capital stock consists of 25,000,000 shares of common stock, par value \$0.01 per share, and 5,000,000 shares of preferred stock, par value \$0.01 per share. After our one-for-ten reverse stock split on May 31, 2016, 2,740,212 shares of our common stock were outstanding, and no shares of our preferred stock, were outstanding.

Common Stock

Subject to the preferences that may be applicable to any outstanding preferred stock, holders of our common stock are entitled to receive ratably any dividends that may be declared by our board of directors out of funds legally available for that purpose. Holders of our common stock are entitled to one vote for each share on all matters voted on by stockholders, including the election of directors. Holders of our common stock do not have any conversion, redemption, sinking fund or preemptive rights. In the event of our dissolution, liquidation or winding up, holders of our common stock are entitled to share ratably in any assets remaining after the satisfaction in full of the prior rights of creditors and the aggregate liquidation preference of any preferred stock then outstanding. The rights, preferences and privileges of the 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 preferred stock that we may designate and issue in the future. All outstanding shares of our common stock are, and any shares of common stock that we may issue in the future will be, fully paid and non-assessable.

Preferred Stock

We may issue any class of preferred stock in any series. Our board of directors has the authority, subject to limitations prescribed under Delaware law, to issue preferred stock in one or more series, to establish from time to time the number of shares to be included in each series and to fix the designation, powers, preferences and rights of the shares of each series and any of its qualifications, limitations and restrictions. Our board of directors can also increase or decrease the number of shares of any series, but not below the number of shares of that series then outstanding. Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of the common stock. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring or preventing a change in control of our company and may adversely affect the market price of our common stock and the voting and other rights of the holders of common stock.

Warrants

Tradable Warrants Included in Units Issuable in the Rights Offering

The Warrants to be issued as a part of this Rights Offering will be separately transferable following their issuance and through their expiration five years from the date of issuance. The Warrants entitle the holder to purchase one share of common stock at an exercise price of \$ _____ per share, 120% of the per Unit price, from the date of issuance through its expiration on _____, 2021. We have applied to list the Warrants for trading on NASDAQ under the symbol "ONTXW," however, there is no assurance that a sufficient number of Subscription Rights will be exercised so that the Warrants will meet the minimum listing criteria to be accepted for listing on NASDAQ. The common stock underlying the Warrants, upon issuance, will also be traded on NASDAQ under the symbol "ONTX."

All Warrants that are purchased in the Rights Offering as part of the Units will be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration (DRS) account statement from our transfer agent reflecting ownership of Warrants if you are a holder of record of shares or warrants. The Subscription Agent will arrange for the issuance of the Warrants as soon as

practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected. If you hold your shares of common stock in the name of a custodian bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the Warrants you purchased in the Rights Offering.

The Warrants will be exercisable by paying the exercise price in cash, or, solely during any period when a registration statement for the exercise of the Warrants is not in effect, exercisable on a cashless basis.

The exercise price of the Warrants and the number of shares of common stock issuable upon exercise of the Warrants are subject to adjustment in certain circumstances, including a stock split of, stock dividend on, or a subdivision, combination or recapitalization of the common stock.

Except as described below, a holder may not exercise any portion of the Warrant to the extent that the holder would beneficially own more than 4.99% of our outstanding common stock after exercise, except that upon at least 61 days' prior notice from the holder to us, the holder may increase the amount of ownership of outstanding stock after exercising the holder's Warrants up to 9.99% of the number of shares of our common stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the Warrants. The foregoing limitation on exercise does not apply to any holder who beneficially owns in excess of 4.99% of our outstanding common stock immediately prior to the Rights Offering.

No public market currently exists for the Warrants. We have applied to list the Warrants on NASDAQ under the symbol "ONTXW," although there is no assurance that a sufficient number of Subscription Rights will be exercised so that the Warrants will meet the minimum listing criteria to be accepted for listing on NASDAQ. Even if the Warrants are listed on NASDAQ, an active public market for the Warrants may not be developed or sustained. Without an active trading market, the liquidity of the Warrants will be limited.

Subject to applicable laws and the restriction on transfer set forth in the warrant, the warrant may be transferred at the option of the holder upon surrender of the warrant to us together with the appropriate instruments of transfer.

After the one-year anniversary of issuance, we may redeem the Warrants for \$0.001 per Warrant if our common stock is above \$ per share, 300% of the exercise price, for each of 10 consecutive trading days.

The Warrants do not confer upon the holder any voting or any other rights of a shareholder of the Company. Upon notice to the Warrants holders, we have the right at any time and from time to time, to reduce the exercise price or to extend the Warrants termination date.

The Warrants will be issued pursuant to a warrant agreement by and between us and Wells Fargo Bank, N.A., as the warrant agent.

Pre-Funded Warrants Issuable in Lieu of Common Stock in the Rights Offering

Any Pre-Funded Warrants issued as a part of this Rights Offering will be separately transferable following their issuance and through their expiration five years from the date of issuance. The Pre-Funded Warrants entitle the holder to purchase one share of common stock at an exercise price of \$0.01 per share, and the subscription price per Unit for any such electing investors will be reduced to \$ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). Each Pre-Funded Warrant will be exercisable from the date of issuance through its expiration on , 2021. The Pre-Funded Warrants will not be listed for trading on any stock exchange or market.

Any Pre-Funded Warrants that are purchased in the Rights Offering as part of the Units will be issued in physical form. The Subscription Agent will arrange for the issuance of the Pre-Funded Warrants as soon as practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected.

The Pre-Funded Warrants will be exercisable by paying the exercise price in cash or on a cashless basis. The exercise price of the Pre-Funded Warrants and the number of shares of common stock issuable upon exercise of the Pre-Funded Warrants are subject to adjustment in certain circumstances, including a stock split of, stock dividend on, or a subdivision, combination or recapitalization of the common stock.

A holder may not exercise any portion of the Pre-Funded Warrant to the extent that the holder would beneficially own more than 4.99% of our outstanding common stock after exercise, except that upon at least 61 days' prior notice from the holder to us, the holder may increase the amount of ownership of outstanding stock after exercising the holder's Pre-Funded Warrant up to 9.99% of the number of shares of our common stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the Pre-Funded Warrant.

Subject to applicable laws, the pre-funded warrants may be offered for sale, sold, transferred or assigned without our consent.

The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a shareholder of the Company.

Other Currently Outstanding Warrants

On January 11, 2016, we issued common stock purchase warrants, referred to as our "participating warrants," to purchase up to 96,842 shares of our common stock at an exercise price equal to \$11.50 per share, subject to customary adjustments and as adjusted for our one-for-ten reverse stock split effective May 31, 2016. Upon the terms and subject to the limitations on exercise and the conditions set forth in the participating warrants, the participating warrants are exercisable at any time on or after July 11, 2016 and on or prior to July 11, 2021. The participating warrants expire on July 11, 2021. The participating warrants entitle the holder to participate in any dividend or distribution, including any distribution of rights to purchase common stock, to the holders of our common stock. Subject to limited exceptions, a holder of participating warrants will not have the right to exercise any portion of its participating warrants if the holder, together with its affiliates, would beneficially own in excess of 9.99% of the number of shares of our common stock outstanding immediately after giving effect to such exercise.

The participating warrants and the shares of our common stock issuable upon exercise of the participating warrants were offered and sold without registration under the Securities Act of 1933, as amended ("the Securities Act"), or state securities laws, in reliance on the exemptions provided by Section 4(a)(2) of the Act and/or Regulation D promulgated thereunder and in reliance on similar exemptions under applicable state laws. Accordingly, neither the participating warrants nor the shares of our common stock underlying the participating warrants may be offered or sold except pursuant to an effective registration statement under the Securities Act or pursuant to an available exemption from, or in a transaction not subject to, the registration requirements of the Securities Act and in accordance with applicable state securities laws.

Prior to our initial public offering, in connection with a credit facility, we issued a warrant to purchase 6,128 shares of Series G convertible preferred stock in June 2009. The warrant was immediately exercisable upon issuance and expires on July 30, 2016. Following the consummation of our initial public offering and the conversion of our Series G convertible preferred stock into shares of

common stock in July 2013, and subsequent adjustments pursuant to the adjustment provisions set forth in that warrant, after our one-for-ten reverse stock split on May 31, 2016, the warrant was exercisable for approximately 582 shares of common stock at an exercise price per share of approximately \$103.08.

Delaware Anti-Takeover Law and Provisions in Our Certificate of Incorporation and Bylaws

Delaware Anti-Takeover Law

We are subject to Section 203 of the Delaware General Corporation Law. Section 203 generally prohibits a public Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a period of three years after the date of the transaction in which the person became an interested stockholder, unless:

- prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding specified shares; or
- at or subsequent to the date of the transaction, the business combination is approved by the board of directors and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66²/₃% of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 defines a "business combination" to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, lease, exchange, mortgage, pledge, transfer or other disposition of 10% or more of the assets of the corporation to or with the interested stockholder;
- subject to exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder;
- subject to exceptions, any transaction involving the corporation that has the effect of increasing the proportionate share of the stock of any class or series of the corporation beneficially owned by the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an "interested stockholder" as any person that is:

- the owner of 15% or more of the outstanding voting stock of the corporation;
- an affiliate or associate of the corporation who was the owner of 15% or more of the outstanding voting stock of the corporation at any time within three years immediately prior to the relevant date; or
- the affiliates and associates of the above.

Under specific circumstances, Section 203 makes it more difficult for an "interested stockholder" to effect various business combinations with a corporation for a three-year period, although the stockholders may, by adopting an amendment to the corporation's certificate of incorporation or bylaws, elect not to be governed by this section, effective 12 months after adoption.

Our certificate of incorporation and bylaws do not exclude us from the restrictions of Section 203. We anticipate that the provisions of Section 203 might encourage companies interested in acquiring us to negotiate in advance with our board of directors since the stockholder approval requirement would be avoided if a majority of the directors then in office approve either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder.

Certificate of Incorporation and Bylaws

Provisions of our certificate of incorporation and bylaws may delay or discourage transactions involving an actual or potential change of control or change in our management, including transactions in which stockholders might otherwise receive a premium for their shares, or transactions that our stockholders might otherwise deem to be in their best interests. Therefore, these provisions could adversely affect the price of our common stock. Among other things, our certificate of incorporation and bylaws will:

- permit our board of directors to issue up to 5,000,000 shares of preferred stock, with any rights, preferences and privileges as they may designate;
- provide that all vacancies on our board of directors, including as a result of newly created directorships, may, except as otherwise required by law, be filled by the affirmative vote of a majority of directors then in office, even if less than a quorum;
- require that any action to be taken by our stockholders must be effected at a duly called annual or special meeting of stockholders and not be taken by written consent;
- provide that stockholders seeking to present proposals before a meeting of stockholders or to nominate candidates for election as directors at a meeting of stockholders must provide advance notice in writing, and also specify requirements as to the form and content of a stockholder's notice;
- not provide for cumulative voting rights, thereby allowing the holders of a majority of the shares of common stock entitled to vote in any election of directors to elect all of the directors standing for election; and
- provide that special meetings of our stockholders may be called only by the board of directors or by such person or persons requested by a majority of the board of directors to call such meetings.

Transfer Agent

The transfer agent and registrar for our common stock is Wells Fargo Bank, N.A.

Listing

Our common stock is listed on the Nasdaq Capital Market under the symbol "ONTX."

PLAN OF DISTRIBUTION

On or about July 6, 2016, we will distribute the Subscription Rights, Subscription Rights Statements and copies of this prospectus to the holders of our common stock and participating warrants on the Record Date. Subscription Rights holders who wish to exercise their Subscription Rights and purchase Units must complete the Subscription Rights Statement and return it with payment for the shares to the Subscription Agent at the following address:

By Mail:

**Wells Fargo Bank, N.A.
Shareowner Services
Voluntary Corporate Actions
P.O. Box 64858
St. Paul, Minnesota 55164-0858**

By Hand or Overnight Courier:

**Wells Fargo Bank, N.A.
Shareowner Services
Voluntary Corporate Actions
1110 Centre Pointe Curve, Suite 101
Mendota Heights, Minnesota 55120**

See "The Rights Offering—Methods for Exercising Subscription Rights."

If you have any questions, you should contact the dealer-manager for the Rights Offering:

**Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745**

Other than as described in this prospectus, we do not know of any existing agreements between any shareholder, broker, dealer, underwriter or agent relating to the sale or distribution of the underlying common stock.

Maxim Group LLC is the dealer-manager of this Rights Offering. We and Maxim may introduce one or more co-dealer-managers and one or more financial advisors to assist in the Rights Offering. In any such event, Maxim Group LLC will be the lead dealer-manager. In such capacity, the dealer-manager will provide marketing assistance and advice to us in connection with this offering and will solicit the exercise of Subscription Rights and participation in the Over-Subscription Privilege. The dealer-manager is not underwriting or placing any of the Subscription Rights or the Units, shares of common stock, Warrants or Pre-Funded Warrants being issued in this offering, and does not make any recommendation with respect to such Subscription Rights (including with respect to the exercise or expiration of such Subscription Rights), Units, shares of common stock, Warrants or Pre-Funded Warrants.

In connection with this Rights Offering, we have agreed to pay to the dealer-manager a cash fee equal to (a) 4.5% of the dollar amount of the Units sold to any holders of Subscription Rights who were beneficial owners of shares of our common stock prior to July 30, 2013, and (b) 8.0% of the dollar amount of the Units sold to any other holders of Subscription Rights. We will provide to the dealer-manager upon completion of the Rights Offering a non-accountable expense allowance equal to the lesser of \$100,000 or 3% of the gross proceeds of the Rights Offering for expenses incurred in

connection with the Rights Offering. We advanced \$30,000 against out-of-pocket accountable expenses to Maxim Group LLC upon its engagement as a dealer-manager; provided that Maxim Group LLC will promptly reimburse to us (i) any portion of the advance not used for actual out-of-pocket expenses, if the Rights Offering is not completed, and (ii) the full amount of the advance, if the Rights Offering is completed.

From the Record Date until 90 days after the closing of the Rights Offering, we have agreed not to issue, agree to issue or announce the issuance of any shares of common stock or common stock equivalents without the consent of the dealer-manager, subject to certain exceptions including a pre-existing agreement, equity awards, conversion of derivative securities and in connection with any acquisitions, partnerships or strategic transactions.

We have also agreed to indemnify the dealer-manager and its respective affiliates against certain liabilities arising under the Securities Act. The dealer-manager's participation in this offering is subject to customary conditions contained in the dealer-manager agreement, including the receipt by the dealer-manager of an opinion of our counsel. The dealer-manager and its affiliates may provide to us from time to time in the future in the ordinary course of their business certain financial advisory, investment banking and other services for which they will be entitled to receive fees.

Maxim Group LLC is a broker-dealer and member of the Financial Industry Regulatory Authority, Inc. The principal business address of Maxim Group LLC is 405 Lexington Avenue, New York, New York 10174.

EXPERTS

The consolidated financial statements of Onconova Therapeutics, Inc. appearing in Onconova Therapeutics, Inc.'s Annual Report (Form 10-K) for the year ended December 31, 2015 have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their report thereon (which contains an explanatory paragraph describing conditions that raise substantial doubt about the Company's ability to continue as a going concern as described in Note 1 to the consolidated financial statements), included therein and incorporated herein by reference. Such consolidated financial statements are incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

LEGAL MATTERS

The validity of the shares of common stock offered hereby and certain other legal matters will be passed upon for us by Pepper Hamilton LLP, Philadelphia, Pennsylvania.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the Securities and Exchange Commission, or "SEC." You may read and copy any documents we file with the SEC at the SEC's Public Reference Room at 100 F Street, NE, Washington, D.C. 20549. You may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. In addition, our filings with the SEC are available to the public through the SEC's Internet site at <http://www.sec.gov>. Information about us is also available on our website at <http://www.onconova.com>. This URL and the SEC's URL above are intended to be inactive textual references only. The information on the SEC's website and our website is not part of, and is not incorporated into, this prospectus.

We have filed a registration statement covering our shares of common stock subject to this offering, of which this prospectus forms a part. This prospectus, however, does not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For

further information concerning us and the securities we may offer and sell, you should read the entire registration statement and the exhibits to the registration statement. The registration statement has been filed electronically and may be obtained in any manner listed above. Any statements contained in this prospectus concerning the provisions of any document are not necessarily complete, and, in each instance, reference is made to the copy of such document filed as an exhibit to the registration statement or otherwise filed with the SEC. Each such statement is qualified in its entirety by such reference.

INCORPORATION BY REFERENCE

The SEC allows us to "incorporate by reference" the information we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus. We incorporate by reference the documents listed below:

- Our Annual Report on Form 10-K for the fiscal year ended December 31, 2015, which we filed with the SEC on March 28, 2016;
- Our Definitive Proxy Statement on Schedule 14A for our 2016 Annual Meeting of Stockholders held May 18, 2016, which we filed with the SEC on April 13, 2016;
- Our Quarterly Report on Form 10-Q for the fiscal period ended March 31, 2016, which we filed with the SEC on May 11, 2016;
- Our current reports on Form 8-K filed with the SEC on January 6, 2016, February 4, 2016, February 17, 2016, March 9, 2016, May 23, 2016 and May 31, 2016;
- The description of our common stock contained in our registration statement on Form 8-A filed on July 23, 2013 (Registration no. 001-36020) with the SEC, including any amendment or report filed for the purpose of updating such description;
- All documents filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, after the date of the initial filing of the registration statement of which this prospectus is a part and prior to the effectiveness of such registration statement; and
- All documents filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act on or after the date of this prospectus and before we stop offering the securities under this prospectus.

We will provide without charge to each person, including any beneficial owner, to whom this prospectus is delivered, upon his or her written or oral request, a copy of any or all documents referred to above which have been or may be incorporated by reference into this prospectus but not delivered with this prospectus excluding exhibits to those documents unless they are specifically incorporated by reference into those documents. You can request those documents from us, at no cost, by writing or telephoning us at: Onconova Therapeutics, Inc., 375 Pheasant Run, Newtown, Pennsylvania, 18940, (267) 759-3036, Attention: Benjamin Hoffman.

The most recent information that we file with the SEC automatically updates and supersedes older information. The information contained in any such filing will be deemed to be a part of this prospectus, commencing on the date on which the filing is made.

Information furnished under Items 2.02 or 7.01 (or corresponding information furnished under Item 9.01 or included as an exhibit) in any past or future Current Report on Form 8-K that we file with the SEC, unless otherwise specified in such report, is not incorporated by reference in this prospectus.



PROSPECTUS

**Subscription Rights to Purchase Up to Units
Consisting of an Aggregate of Up to Shares of Common Stock
and Warrants to Purchase Up to Shares of Common Stock
at a Subscription Price of \$ Per Unit**

Dealer-Manager

Maxim Group LLC

, 2016

PART II
Information Not Required In Prospectus

Item 13. Other Expenses of Issuance and Distribution.

The following is a statement of estimated expenses in connection with the issuance and distribution of the securities being registered, excluding dealer-manager fees. All expenses incurred with respect to the registration of the common stock will be borne by us. All amounts are estimates except the SEC registration fee and the FINRA filing fee.

	<u>Amount to be Paid</u>
SEC Registration Fee	\$ 5,089
FINRA Filing Fee	3,875
NASDAQ Fee	5,000
Printing Expenses	40,000
Legal Fees and Expenses	200,000
Accounting Fees and Expenses	75,000
Subscription Agent and Warrant Agent Fees and Expenses	100,000
Miscellaneous Expenses	20,000
	<u>\$ 448,964</u>

Item 14. Indemnification of Directors and Officers.

We are incorporated under the laws of the State of Delaware. Section 145 of the Delaware General Corporation Law provides that a Delaware corporation may indemnify any persons who are, or are threatened to be made, parties 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 such corporation), by reason of the fact that such person was an officer, director, employee or agent of such corporation, or is or was serving at the request of such person as an officer, director, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding, provided that such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the corporation's best interests and, with respect to any criminal action or proceeding, had no reasonable cause to believe that his or her conduct was illegal.

A Delaware corporation may indemnify any persons who are, or are threatened to be made, a party to any threatened, pending or completed action or suit by or in the right of the corporation by reason of the fact that such person was a director, officer, employee or agent of such corporation, or is or was serving at the request of such corporation as a director, officer, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys' fees) actually and reasonably incurred by such person in connection with the defense or settlement of such action or suit provided that such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the corporation's best interests except that no indemnification is permitted without judicial approval if the officer or director is adjudged to be liable to the corporation. Where an officer or director is successful on the merits or otherwise in the defense of any action referred to above, the corporation must indemnify him or her against the expenses which such officer or director has actually and reasonably incurred. Our certificate of incorporation and bylaws provide for the indemnification of our directors and officers to the fullest extent permitted under the Delaware General Corporation Law.

Section 102(b)(7) of the Delaware General Corporation Law permits a corporation to provide in its certificate of incorporation that a director of the corporation shall not be personally liable to the

corporation or its stockholders for monetary damages for breach of fiduciary duties as a director, except for liability for any:

- transaction from which the director derives an improper personal benefit;
- act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payment of dividends or redemption of shares; or
- breach of a director's duty of loyalty to the corporation or its stockholders.

Our certificate of incorporation includes such a provision. Expenses incurred by any officer or director in defending any such action, suit or proceeding in advance of its final disposition shall be paid by us upon delivery to us of an undertaking, by or on behalf of such director or officer, to repay all amounts so advanced if it shall ultimately be determined that such director or officer is not entitled to be indemnified by us.

As permitted by the Delaware General Corporation Law, we have entered into indemnification agreements with our directors and executive officers. These agreements, among other things, require us to indemnify each director and officer to the fullest extent permitted by law and advance expenses to each indemnitee in connection with any proceeding in which indemnification is available.

At present, there is no pending litigation or proceeding involving any of our directors or executive officers as to which indemnification is required or permitted, and we are not aware of any threatened litigation or proceeding that may result in a claim for indemnification.

We have an insurance policy covering our officers and directors with respect to certain liabilities, including liabilities arising under the Securities Act.

Item 15. Recent Sales of Unregistered Securities.

On October 8, 2015, the Company entered into the Purchase Agreement with Lincoln Park, pursuant to which the Company has the right to sell to, and Lincoln Park is obligated to purchase from the Company, up to \$16.5 million in shares of the Company's common stock, subject to certain limitations, from time to time, over the 36-month period commencing on the date that this registration statement is declared effective by the SEC and a final prospectus in connection therewith is filed. On October 8, 2015, Lincoln Park purchased 846,755 shares of the Company's common stock for a total purchase price of \$1,500,000 as an initial purchase under the Purchase Agreement and the Company issued 200,000 shares of common stock pursuant to the terms of the Purchase Agreement as consideration for its commitment to purchase additional shares of common stock under the Purchase Agreement. The sale of such shares to Lincoln Park was not registered under the Securities Act because it was made in a transaction exempt from registration under Section 4(a)(2) of the Securities Act and/or Rule 506 promulgated thereunder.

On January 5, 2016, the Company entered into a Securities Purchase Agreement (the "Purchase Agreement") with an institutional investor (the "Investor") providing for the issuance and sale by the Company of 1,936,842 shares of the Company's common stock at a purchase price of \$0.95 per share and warrants to purchase 968,421 shares of the Company's common stock (the "Private Placement Warrants") for aggregate gross proceeds of \$1,840,000. The shares of the Company's common stock were offered pursuant to an effective shelf registration statement on Form S-3, declared effective by the SEC on November 20, 2014 (File No. 333-199219). The Private Placement Warrants were issued and sold without registration under the Securities Act in reliance on the exemptions provided by Section 4(a)(2) of the Securities Act and/or Regulation D promulgated thereunder and in reliance upon similar exemptions under applicable state laws. Each Private Placement Warrant shall be initially exercisable on the six (6) month anniversary of the issuance date at an exercise price equal to \$1.15 per

share of Common Stock, subject to customary adjustments, and have a term of exercise of five (5) years from the initial exercise date. H.C. Wainwright & Co., LLC acted as the Company's exclusive placement agent for the issuance and sale of the shares of common stock and Private Placement Warrants, and was paid a cash fee equal to 7.5% of the gross proceeds received by the Company from the sale of the securities in the transactions and was reimbursed by the Company for up to \$50,000 in expenses.

Item 16. Exhibits and Financial Statement Schedules.

(a) Exhibits

The exhibits to the registration statement are listed in the Exhibit Index to this registration statement and are incorporated herein by reference.

(b) Financial statement schedules

All schedules have been omitted because either they are not required, are not applicable or the information is otherwise set forth in the financial statements and related notes thereto.

Item 17. Undertakings.

The undersigned registrant hereby undertakes:

- (1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:
 - (i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933 (the "Act");
 - (ii) To reflect in the prospectus any facts or events arising after the effective date of this registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and
 - (iii) To include any material information with respect to the plan of distribution not previously disclosed in this registration statement or any material change to such information in this registration statement.

Provided, however, that Paragraphs (1)(i), (1)(ii) and (1)(iii) of this section do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to section 13 or section 15(d) of the Exchange Act that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

- (2) That, for the purpose of determining any liability under the Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(5) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

If the registrant is subject to Rule 430C (§230.430C of this chapter), each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A (§230.430A of this chapter), shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(6) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

- (i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424 (§230.424 of this chapter);
- (ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;
- (iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and
- (iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to section 13(a) or section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement 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.

Insofar as indemnification for liabilities arising under the Securities Act of 1933 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 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 Act and will be governed by the final adjudication of such issue.

The undersigned registrant hereby undertakes that:

- (1) For purposes of determining any liability under the Securities Act of 1933, 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 of 1933, 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.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
*		
<hr/> E. Premkumar Reddy, Ph.D.	Director	June 29, 2016
*		
<hr/> Jack E. Stover	Director	June 29, 2016

The undersigned by signing his name hereto signs and executes this Pre-Effective Amendment No. 1 to Registration Statement on Form S-1 pursuant to the Powers of Attorney executed by the above named signatories and previously filed with the Commission on June 1, 2016.

*By: /s/ RAMESH KUMAR, PH.D.

Ramesh Kumar, Ph.D., Attorney-in-Fact

EXHIBIT INDEX

<u>Exhibit Number</u>	<u>Exhibit Description</u>
1.1	Form of Dealer—Manager Agreement
3.1	Tenth Amended and Restated Certificate of Incorporation of Onconova Therapeutics, Inc. <i>(Incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed on July 30, 2013).</i>
3.2	Amended and Restated Bylaws of Onconova Therapeutics, Inc. <i>(Incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed on July 30, 2013).</i>
3.3	Certificate of Amendment to Tenth Amended and Restated Certificate of Incorporation of Onconova Therapeutics, Inc. <i>(Incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed on May 31, 2016).</i>
4.1	Form of Certificate of Common Stock <i>(Incorporated by reference to Exhibit 4.1 to Pre-Effective Amendment No. 1 the Company's Registration Statement on Form S-1 filed on July 11, 2013.)</i>
4.2	Eighth Amended and Restated Stockholders' Agreement, effective as of July 27, 2012, by and among Onconova Therapeutics, Inc. and certain stockholders named therein <i>(Incorporated by reference to Exhibit 4.2 to Pre-Effective Amendment No. 1 to the Company's Registration Statement on Form S-1 filed on July 11, 2013).</i>
4.3	Amendment No. 1 to Eighth Amended and Restated Stockholders' Agreement, effective as of July 9, 2013 <i>(Incorporated by reference to Exhibit 4.2 to Pre-Effective Amendment No. 1 the Company's Registration Statement on Form S-1 filed on July 11, 2013).</i>
4.4	Form of warrant issued January 11, 2016 <i>(Incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed on January 6, 2016).</i>
4.5	Form of Subscription Rights Statement
4.6†	Form of Warrant Certificate for Warrants underlying Units
4.7†	Form of Warrant Agreement
4.8†	Form of Pre-Funded Warrant
5.1	Opinion of Pepper Hamilton LLP
10.1*	Development and License Agreement, effective as of September 19, 2012, by and between Onconova Therapeutics, Inc. and Baxter Healthcare SA <i>(Incorporated by reference to Exhibit 10.1 to Pre-Effective Amendment No. 2 the Company's Registration Statement on Form S-1 filed on July 18, 2013).</i>
10.2*	License Agreement, effective as of July 5, 2011, by and between Onconova Therapeutics, Inc. and SymBio Pharmaceuticals Limited <i>(Incorporated by reference to Exhibit 10.2 to Pre-Effective Amendment No. 2 the Company's Registration Statement on Form S-1 filed on July 18, 2013).</i>
10.3*	First Amendment to License Agreement, effective as of September 2, 2011, by and between Onconova Therapeutics, Inc. and SymBio Pharmaceuticals Limited <i>(Incorporated by reference to Exhibit 10.3 to the Company's Registration Statement on Form S-1 filed on June 14, 2013).</i>
10.4*	License Agreement, effective as of January 1, 1999, by and between Onconova Therapeutics, Inc. and Temple University—Of The Commonwealth System of Higher Education <i>(Incorporated by reference to Exhibit 10.4 to the Company's Registration Statement on Form S-1 filed on June 14, 2013).</i>
10.5*	Amendment to License Agreement, effective as of September 1, 2000, by and between Temple University—Of The Commonwealth System of Higher Education and Onconova Therapeutics, Inc. <i>(Incorporated by reference to Exhibit 10.5 to the Company's Registration Statement on Form S-1 filed on June 14, 2013).</i>

Exhibit Number	Exhibit Description
10.6*	Amendments to Exclusive License Agreement, effective as of March 21, 2013, by and between Temple University—Of The Commonwealth System of Higher Education and Onconova Therapeutics, Inc. <i>(Incorporated by reference to Exhibit 10.6 to the Company's Registration Statement on Form S-1 filed on June 14, 2013).</i>
10.7*	Definitive Agreement, effective as of May 12, 2010, by and between Onconova Therapeutics, Inc. and The Leukemia and Lymphoma Society <i>(Incorporated by reference to Exhibit 10.7 to the Company's Registration Statement on Form S-1 filed on June 14, 2013).</i>
10.8*	First Amendment to Definitive Agreement, effective as of June 23, 2011, by and between Onconova Therapeutics, Inc. and The Leukemia and Lymphoma Society <i>(Incorporated by reference to Exhibit 10.8 to the Company's Registration Statement on Form S-1 filed on June 14, 2013).</i>
10.9*	Second Amendment to Definitive Agreement, effective as of May 29, 2012, by and between Onconova Therapeutics, Inc. and The Leukemia and Lymphoma Society <i>(Incorporated by reference to Exhibit 10.9 to the Company's Registration Statement on Form S-1 filed on June 14, 2013).</i>
10.10*	Third Amendment to Definitive Agreement, effective as of January 5, 2013, by and between Onconova Therapeutics, Inc. and The Leukemia and Lymphoma Society <i>(Incorporated by reference to Exhibit 10.10 to the Company's Registration Statement on Form S-1 filed on June 14, 2013).</i>
10.11*	Termination of Agreement, effective as of February 5, 2013, by and between Onconova Therapeutics, Inc. and The Leukemia and Lymphoma Society <i>(Incorporated by reference to Exhibit 10.11 to the Company's Registration Statement on Form S-1 filed on June 14, 2013).</i>
10.12*	Limited Liability Company Agreement of GBO, LLC, dated as of December 12, 2012, by and between Onconova Therapeutics, Inc. and GVK Biosciences Private Limited <i>(Incorporated by reference to Exhibit 10.12 to the Company's Registration Statement on Form S-1 filed on June 14, 2013).</i>
10.13	Onconova Therapeutics, Inc. 2007 Equity Compensation Plan, and forms of agreement thereunder <i>(Incorporated by reference to Exhibit 10.13 to Pre-Effective Amendment No. 1 the Company's Registration Statement on Form S-1 filed on July 11, 2013).</i>
10.14	Employment Agreement, effective as of July 1, 2015, by and between Onconova Therapeutics, Inc. and Ramesh Kumar, Ph.D. <i>(Incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on July 8, 2015).</i>
10.15	Letter Agreement, effective as of January 1, 2016, by and between Onconova Therapeutics, Inc. and Ramesh Kumar, Ph.D. <i>(Incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on February 17, 2016).</i>
10.16	Amended and Restated Employment Agreement, effective as of July 1, 2015, by and between Onconova Therapeutics, Inc. and Thomas McKearn, M.D., Ph.D. <i>(Incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on July 8, 2015).</i>
10.17	Amended and Restated Employment Agreement, effective as of July 1, 2015, by and between Onconova Therapeutics, Inc. and Ajay Bansal. <i>(Incorporated by reference to Exhibit 10.4 to the Company's Current Report on Form 8-K filed on July 8, 2015).</i>
10.18	Consulting Agreement, effective as of January 1, 2012, by and between Onconova Therapeutics, Inc. and E. Premkumar Reddy, Ph.D., including Consultant Agreement Renewal, dated February 27, 2013 <i>(Incorporated by reference to Exhibit 10.23 to the Company's Registration Statement on Form S-1 filed on June 14, 2013)</i>

<u>Exhibit Number</u>	<u>Exhibit Description</u>
10.19	Form of Indemnification Agreement entered into by and between Onconova Therapeutics, Inc. and each director and executive officer <i>(Incorporated by reference to Exhibit 10.24 to Pre-Effective Amendment No. 1 the Company's Registration Statement on Form S-1 filed on July 11, 2013).</i>
10.20	Onconova Therapeutics, Inc. 2013 Equity Compensation Plan, and forms of agreement thereunder <i>(Incorporated by reference to Exhibit 10.25 to Pre-Effective Amendment No. 1 the Company's Registration Statement on Form S-1 filed on July 11, 2013).</i>
10.21	Onconova Therapeutics, Inc. 2013 Performance Bonus Plan <i>(Incorporated by reference to Exhibit 10.26 to Pre-Effective Amendment No. 1 the Company's Registration Statement on Form S-1 filed on July 11, 2013).</i>
10.22	Employment Agreement, effective as of July 1, 2015, by and between Onconova Therapeutics, Inc. and Dr. Manoj Manair <i>(Incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed on July 8, 2015).</i>
10.23	Employment Agreement, effective as of July 1, 2015, by and between Onconova Therapeutics, Inc. and Mark Guerin <i>(Incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on February 17, 2016).</i>
10.24	Amended and Restated Employment Agreement between Onconova Therapeutics, Inc. and Steven Fruchtman, M.D. <i>(Incorporated by reference to Exhibit 10.5 to the Company's Quarterly Report on Form 10-Q filed on August 13, 2015).</i>
10.25	Purchase Agreement between Onconova Therapeutics, Inc. and Lincoln Park Capital Fund, LLC, dated October 8, 2015 <i>(Incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on October 8, 2015).</i>
10.26	Registration Rights Agreement between Onconova Therapeutics, Inc. and Lincoln Park Capital Fund, LLC, dated October 8, 2015 <i>(Incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on October 8, 2015).</i>
10.27	Form of Securities Purchase Agreement between Onconova Therapeutics and the Investor party thereto, dated January 5, 2016 <i>(Incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on January 6, 2016).</i>
21.1	Subsidiaries of Onconova Therapeutics, Inc. <i>(Incorporated by reference to Exhibit 21.1 to the Company's Annual Report on Form 10-K filed on March 28, 2016).</i>
23.1	Consent of Ernst & Young, LLP.
23.2†	Consent of Pepper Hamilton LLP (included in Exhibit 5.1)
24.1D	Power of Attorney
99.1	Form of Instructions as to Use of Subscription Rights Statements
99.2	Form of Letter to Shareholders who are Record Holders
99.3	Form For Use With Election to Receive Pre-Funded Warrants

† To be filed by amendment.

D Previously filed.

* Confidential treatment has been requested with respect to certain portions of this exhibit. Omitted portions have been filed separately with the Securities and Exchange Commission.

ONCONOVA THERAPEUTICS, INC.

DEALER-MANAGER AGREEMENT

, 2016

Maxim Group LLC
405 Lexington Avenue
New York, NY 10174
As Dealer-Manager

Ladies and Gentlemen:

The following (this “**Agreement**”) will confirm our agreement relating to the proposed rights offering (the “**Rights Offering**”) to be undertaken by Onconova Therapeutics, Inc., a Delaware corporation (the “**Company**”), pursuant to which the Company will distribute to holders of record of its common stock, par value \$0.01 per share (the “**Common Stock**”) and to holders of certain of its outstanding warrants to purchase approximately 96,842 shares of common stock, issued on January 11, 2016 (the “**Participating Warrants**”), who are entitled to participate in such offering pursuant to the terms of such warrants, subscription rights (the “**Rights**”) to subscribe for up to an aggregate of [4,255,581] units (the “**Units**”), each Unit consisting of one share of Common Stock (the “**Rights Shares**”) and 0.75 of a warrant representing the right to purchase one share of Common Stock at an exercise price of \$ _____ per share (the “**Rights Warrants**”), at a subscription price of \$ _____ per Unit in cash (the “**Subscription Price**”).

For certain investors whose subscriptions may result in the purchaser beneficially owning more than 4.99% of the Company’s Common Stock, such investors may elect to receive in the Rights Offering, in lieu of shares of Common Stock, certain pre-funded warrants (the “**Pre-Funded Warrants**”) to purchase the same amount of shares of Common Stock at an exercise price of \$0.01, and the subscription price per Unit for any such electing investors will be reduced to \$ _____ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). For the purposes of this Agreement, the term “Rights Shares” shall include any such Pre-Funded Warrants and the shares of Common Stock issuable upon exercise of such Pre-Funded Warrants, as the context may require.

1. The Rights Offering.

(a) The Company proposes to undertake the Rights Offering pursuant to which each holder of Common Stock or a Participating Warrant shall receive 1.5 Rights for each share of Common Stock (or, in the case of the Participating Warrant, each share of Common Stock underlying such Participating Warrant) held of record at the close of business on July 7, 2016 (the “**Record Date**”). Holders of Rights will be entitled to subscribe for and purchase, at the Subscription Price, one Unit for each Right held (the “**Basic Subscription Right**”). The Rights Shares and Rights Warrants comprising the Units will separate at Closing and will be issued as separate securities. Rights holders will only be entitled to purchase a number of Units

representing a whole number of Rights Shares, rounded down to the nearest whole number of Units a holder would otherwise be entitled to purchase.

(b) The Rights will not trade or be listed for quotation on any exchange or service, and shall be non-transferable.

(c) Any holder of Rights who fully exercises all Basic Subscription Rights issued to such holder is entitled to subscribe for Units which were not otherwise subscribed for by others pursuant to their Basic Subscription Rights (the “**Over-Subscription Privilege**”). The Over-Subscription Privilege shall allow a holder of a Right to subscribe for an additional amount of Units above the amount which such holder was otherwise entitled to subscribe. Units acquired pursuant to the Over-Subscription Privilege are subject to allotment, as more fully discussed in the Prospectus (as defined herein).

(d) The Rights will expire at 5:00 p.m., Eastern time, on July 26, 2016 (the “**Expiration Date**”). The Company shall have the right to extend the Expiration Date in its sole discretion. Any Rights not exercised on or before the Expiration Date will expire worthless without any payment to the holders of unexercised Rights.

(e) All funds from the exercise of Basic Subscription Rights and Over-Subscription Privileges will be deposited with Wells Fargo Bank, N.A. (“**Wells Fargo**”), as subscription agent (in this context, the “**Subscription Agent**”), and held in a segregated account with the Subscription Agent pending a final determination of the number of Units, Rights Shares and Rights Warrants to be issued pursuant to the exercise of Basic Subscription Rights and Over-Subscription Privileges. The Company may conduct a closing of the Rights Offering (a “**Closing**”) at its sole discretion at any time following the Expiration Date.

2. Appointment as Dealer-Managers; Role of Dealer-Managers.

(a) On the terms and conditions set forth herein, the Company hereby appoints Maxim Group LLC (“**Maxim**”) as the dealer-manager (the “**Dealer-Manager**”) for the Rights Offering and authorizes the Dealer-Manager to act as such in connection with the Rights Offering.

(b) The services previously provided by the Dealer-Manager under that certain engagement letter, dated May 6, 2016, between the Company and the Dealer-Manager (as amended, the “**Engagement Letter**”), or to be provided thereunder or hereunder by the Dealer-Manager through the Closing, consist of the following:

(i) providing market assistance in connection with the conduct of the Rights Offering (which shall include assisting the Company in drafting a presentation that may be used to market the Rights Offering to investors and assistance in the coordination of the Rights Offering together with Wells Fargo);

(ii) providing financial advice to the Company in connection with the Rights Offering (including advice regarding the structure, pricing, timing and other terms and conditions of the Rights Offering);

(iii) responding to requests for information and materials in connection with the Rights Offering (the services described in clauses (i), (ii) and (iii) being collectively referred to as the “**Advisory Services**”); and

(iv) in accordance with customary practice, using best efforts to solicit the exercise of the Rights and subscriptions for the Units pursuant to the Offer Documents (the services described in this clause (iv) being referred to as the “**Solicitation Services**”);

(c) The services of the Dealer-Manager described in clauses (b)(iii) and (iv) above shall commence on the date that the Registration Statement is declared effective by the U.S. Securities and Exchange Commission (the “**Commission**”). The Company hereby authorizes the Dealer-Manager, or one or more registered broker-dealers chosen exclusively by the Dealer-Manager, to act as the Company’s agent in making the Rights Offering to residents of such states as to which such agent designation may be necessary to comply with applicable law.

(d) The Company hereby acknowledges that Maxim is acting only as a dealer-manager in connection with the Rights Offering. The Dealer-Manager shall not (and shall not be obligated to) underwrite or place any Rights or any Units, Rights Shares or Rights Warrants, and the Company acknowledges and agrees that Maxim’s participation as Dealer-Manager does not ensure or guarantee that the Company will raise any funds through the Rights Offering.

(e) The Company further acknowledges that Maxim is acting as an independent contractor pursuant to a contractual relationship created solely by this Agreement entered into on an arm’s-length basis and in no event do the parties intend that Maxim act or be responsible as a fiduciary to the Company, its management, shareholders, creditors or any other natural person, partnership, limited liability partnership, corporation, limited liability company, business trust, joint stock company, trust, unincorporated association, joint venture, or other entity or organization (each, a “**Person**”) in connection with any activity that Maxim may undertake or has undertaken in furtherance of the Rights Offering, either before or after the date hereof. Maxim hereby expressly disclaims any fiduciary or similar obligations to the Company, either in connection with the transactions contemplated by this Agreement or any matters leading up to such transactions, and the Company hereby confirms its understanding and agreement to that effect. The Company and Maxim agree that they are each responsible for making their own independent judgments with respect to any such transactions, and that, as between the Company and Maxim, any opinions or views expressed by Maxim to the Company regarding such transactions, including but not limited to any opinions or views with respect to the price or market for the Company’s securities, do not constitute advice or recommendations to the Company. The Company hereby waives and releases, to the fullest extent permitted by law, any claims that the Company may have against Maxim with respect to any breach or alleged breach of any fiduciary or similar duty to the Company in connection with the transactions contemplated by this Agreement or any matters leading up to such transactions.

3. No Liability for Acts of Brokers, Dealers, Banks and Trust Companies. The Dealer-Manager shall not be subject to any liability to the Company (or any of the Company’s Subsidiaries (as defined below) or Affiliates (as defined below)) for any act or omission on the part of any broker or dealer in securities (other than the Dealer-Manager) or any bank or trust company or any other Person, and the Dealer-Manager shall not be liable for their own acts or

omissions in performing their obligations as advisors or Dealer-Manager hereunder or otherwise in connection with the Rights Offering or the related transactions, except for any losses, claims, damages, liabilities and expenses determined in a final judgment by a court of competent jurisdiction to have resulted directly from any such acts or omissions undertaken or omitted to be taken by the Dealer-Manager through its gross negligence or willful misconduct. In soliciting or obtaining exercises of Rights, the Dealer-Manager shall not be deemed to be acting as the agent of the Company or as the agent of any broker, dealer, bank or trust company, and no broker, dealer, bank or trust company shall be deemed to be acting as the Dealer-Manager’s agent or as the agent of the Company. As used herein, the term “**Subsidiary**” means a Subsidiary of the Company as defined in Rule 405 of the rules and regulations of the Commission (the “**Rules and Regulations**”) promulgated under the Securities Act of 1933, as amended (the “**Securities Act**”), and the term “**Affiliate**” means an Affiliate of the Company as defined in Rule 144 under the Rules and Regulations under the Securities Act. Unless the context specifically requires otherwise, the term “Company” as used in this Agreement means the Company and its Subsidiaries collectively on a consolidated basis.

4. The Offer Documents.

(a) There will be used in connection with the Rights Offering certain materials in addition to the Registration Statement, any Preliminary Prospectus or the Prospectus (each as defined herein), including: (i) all exhibits to the Registration Statement which pertain to the conduct of the Rights Offering; and (ii) any soliciting materials relating to the Rights Offering approved by the Company (clauses (i) and (ii), collectively with the Registration Statement, any Preliminary Prospectus and the Prospectus, the “**Offer Documents**”). The Dealer-Manager shall be given such opportunity to review and comment upon the Offer Documents.

(b) The Company agrees to furnish the Dealer-Manager with as many copies as it may reasonably request of the final forms of the Offer Documents and the Dealer-Manager is authorized to use copies of the Offer Documents in connection with its acting as Dealer-Manager. The Dealer-Manager hereby agrees that it will not disseminate any written material for or in connection with the solicitation of exercises of Rights pursuant to the Rights Offering other than the Offer Documents.

(c) The Company represents and agrees that no solicitation material, other than the Offer Documents (each in the form of which has been approved by the Dealer-Manager), will be used in connection with the Rights Offering by or on behalf of the Company without the prior approval of the Dealer-Manager, which approval will not be unreasonably withheld. In the event that the Company uses or permits the use of any such solicitation material in connection with the Rights Offering, then the Dealer-Manager shall be entitled to withdraw as Dealer-Manager in connection with the Rights Offering and the related transactions without any liability or penalty to the Dealer-Manager or any other Person identified in Section 11 hereof as an “indemnified party,” and such Dealer-Manager shall be entitled to receive the payment of all fees and expenses payable under this Agreement and the Engagement Letter which have accrued to the date of such withdrawal.

5. Representations and Warranties. The Company represents and warrants to the Dealer-Manager that:

(a) The Registration Statement on Form S-1 (Registration No. 333-211769) with respect to the Rights, the Units, the Rights Shares (including, for the avoidance of doubt, any Pre-Funded Warrants and the shares of Common Stock underlying such Pre-Funded Warrants), the Rights Warrants and the shares of Common Stock issuable upon exercise of the Rights Warrants (“**Underlying Shares**”) has: (i) been prepared by the Company in conformity with, in all material respects, the requirements of the Securities Act and the Rules and Regulations; (ii) been filed with the Commission under the Securities Act; and (iii) become effective under the Securities Act. Copies of such Registration Statement as amended to date have been delivered or made available by the Company to the Dealer-Manager. For purposes of this Agreement, “**Effective Time**” means the date and the time as of which such Registration Statement, or the most recent post-effective amendment thereto, if any, was declared effective by the Commission; “**Effective Date**” means the date of the Effective Time; “**Preliminary Prospectus**” means each prospectus included in such registration statement, or amendments thereof, before it becomes effective under the Securities Act and any prospectus filed with the Commission by the Company with the consent of the Dealer-Manager pursuant to Rule 424(a) of the Rules and Regulations; “**Registration Statement**” means such Registration Statement, as amended at the Effective Time, including any documents which are incorporated by reference therein or are exhibits thereto; and “**Prospectus**” means such final prospectus, as first filed with the Commission pursuant to paragraph (1) or (4) of Rule 424(b) of the Rules and Regulations. The Commission has not issued any order preventing or suspending the use of any Preliminary Prospectus or the Prospectus. All references in this Agreement to the Registration Statement, a Preliminary Prospectus, and the Prospectus, or any amendments or supplements to any of the foregoing shall be deemed to include any copy thereof filed with the Commission pursuant to its Electronic Data Gathering, Analysis and Retrieval System (“**EDGAR**”). Additionally, any reference in this Agreement to the Registration Statement, any Preliminary Prospectus or the Prospectus shall be deemed to refer to and include the documents incorporated by reference therein pursuant to Item 12 of Form S-1 under the Securities Act, as of the Effective Time of the Registration Statement or the date of such Preliminary Prospectus or the Prospectus, as the case may be. The Prospectus delivered to the Dealer-Manager for use in connection with the Rights Offering will be identical to the electronically transmitted copies thereof filed with the Commission pursuant to EDGAR, except to the extent permitted by Regulation S-T promulgated by the Commission.

(b) The Registration Statement (together with all exhibits filed as part of the Registration Statement) conforms, and any Preliminary Prospectus and the Prospectus and any further amendments or supplements to the Registration Statement conforms or will conform, when they are filed with or become effective by the Commission, as the case may be, in each case, in all material respects, to the requirements of the Securities Act and the Rules and Regulations and collectively do not and will not, as of the applicable Effective Date (as to the Registration Statement and any amendment thereto) and as of the applicable filing date (as to the Prospectus and any amendment or supplement thereto) contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein (with respect to the Prospectus, in the light of the circumstances under which they were made) not misleading; provided that no representation or warranty is made by

5

the Company as to information contained in or omitted from the Registration Statement or the Prospectus in reliance upon and in conformity with written information furnished to the Company by or on behalf of the Dealer-Manager specifically for inclusion therein, it being acknowledged and agreed that such information provided by or on behalf of the Dealer-Manager consists solely and exclusively of the following disclosure contained in the Prospectus (collectively, the “**Dealer-Manager Information**”): (i) the name of Maxim acting in its capacity as dealer-manager for the Rights Offering; (ii) “Summary of the Rights Offering — Distribution Arrangements”; and (iii) “The Rights Offering — Distribution Arrangements.”

(c) Neither: (i) any Issuer Free Writing Prospectus (as defined below) issued at or prior to the Closing and the Prospectus, all considered together (collectively, the “**General Disclosure Package**”), nor (ii) any individual Issuer Free Writing Prospectus, when considered together with the General Disclosure Package, includes or will include as of the Closing any untrue statement of a material fact or omits or will omit as of the Closing to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading. The preceding sentence does not apply to statements in or omissions from any Prospectus included in the Registration Statement, the General Disclosure Package or any Issuer Free Writing Prospectus in conformity with the Dealer-Manager Information.

(d) Each Issuer Free Writing Prospectus, if any, as of its issue date and at all subsequent times until the Closing or until any earlier date that the Company notified or notifies the Dealer-Manager as described in the next sentence, did not, does not and will not include any information that conflicted, conflicts or will conflict with the information contained in the then-current Registration Statement or Prospectus. If at any time following issuance of an Issuer Free Writing Prospectus there occurred or occurs an event or development as a result of which such Issuer Free Writing Prospectus conflicted or would conflict with the information contained in the then-current Registration Statement or Prospectus relating to the Rights, Units, Rights Shares and Rights Warrants or included or would include an untrue statement of a material fact or omitted or would omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances prevailing at that subsequent time, not misleading, the Company has notified or will notify promptly the Dealer-Manager so that any use of such Issuer Free Writing Prospectus may cease until it is promptly amended or supplemented by the Company, at its own expense, to eliminate or correct such conflict, untrue statement or omission.

(e) The Company has not distributed and will not distribute any prospectus or other offering material in connection with the Rights or the offering and sale of the Units, Rights Shares and Rights Warrants other than the General Disclosure Package, any Issuer Free Writing Prospectus or the Prospectus or other materials permitted by the Securities Act to be distributed by the Company. Unless the Company obtains the prior consent of the Dealer-Manager, the Company has not made and will not make any offer relating to the Securities that would constitute an “issuer free writing prospectus,” as defined in Rule 433 under the Securities Act (an “**Issuer Free Writing Prospectus**”), or that would otherwise constitute a “free writing prospectus,” as defined in Rule 405 under the Securities Act, required to be filed with the Commission; provided that the prior written consent of the Dealer-Manager shall be deemed to have been given in respect of any free writing prospectus referenced on Schedule I attached hereto. The Company has complied and will comply with the requirements of Rules 164 and 433

6

under the Securities Act applicable to any Issuer-Represented Free Writing Prospectus as of its issue date and at all subsequent times through the Closing, including timely filing with the Commission where required, legending and record keeping. To the extent an electronic road show is used, the Company has

satisfied and will satisfy the conditions in Rule 433 under the Securities Act to avoid a requirement to file with the Commission any electronic road show.

(f) There are no contracts, agreements, plans or other documents which are required to be described in the Prospectus or filed as exhibits to the Registration Statement by the Securities Act or by the Rules and Regulations which have not been described in the Prospectus or filed as exhibits to the Registration Statement or referred to in, or incorporated by reference into, the exhibit table of the Registration Statement as permitted by the Rules and Regulations.

(g) The Company and each of its Subsidiaries has been organized and is validly existing as a corporation or other business entity under the laws of its respective jurisdiction of organization, to the extent applicable, is in good standing and is qualified to do business in each jurisdiction in which its respective ownership or lease of property or the conduct of its respective businesses requires such qualification, and has all power and authority necessary to own or hold its respective properties and to conduct the businesses in which it is engaged, except where the absence of such power or authority (either individually and in the aggregate) could not reasonably be expected to have a material adverse effect on: (i) the business, condition (financial or otherwise), results of operations, shareholders' equity, properties or prospects (as such prospects are disclosed or described in the Prospectus) of the Company and its Subsidiaries taken as a whole; (ii) the capital stock of the Company; or (iii) the Rights Offering or consummation of any of the other transactions contemplated by this Agreement, the Registration Statement or the Prospectus (any such effect being a "**Material Adverse Effect**").

(h) This Agreement has been duly authorized, executed and delivered by the Company and, assuming the due authorization, execution and delivery by the Dealer-Manager, constitutes the valid and legally binding agreement of the Company, enforceable against the Company in accordance with its terms, except as the enforceability thereof may be limited by bankruptcy, insolvency, reorganization, moratorium or similar laws relating to or affecting creditors' rights generally, by general principles of equity, or by public policy.

(i) Each of the Company and its Subsidiaries: (i) is not in violation of its charter or by-laws, (ii) is not in default under or in breach of, and no event has occurred which, with notice or lapse of time or both, would constitute a default or breach under or result in the creation or imposition of any lien, charge, mortgage, pledge, security interest, claim, equity, trust or other encumbrance, preferential arrangement, defect or restriction of any kind whatsoever (each, a "Lien") upon any of their property or assets pursuant to, any material contract, agreement, indenture, mortgage, deed of trust, loan agreement or other agreement or instrument to which it is a party or by which it is bound or to which any of its properties or assets is subject and (iii) is not in violation in any respect of any law, rule, regulation, ordinance, directive, judgment, decree or order, foreign and domestic, to which it or its properties or assets may be subject or has failed to obtain any material license, permit, certificate, franchise or other governmental authorization or permit necessary to the ownership of its properties or assets or to the conduct of its business, except, in the case of clauses (ii) and (iii) above, any violation, default or failure to possess the same that would not have a Material Adverse Effect.

7

(j) Prior to or on the date hereof, the Company and the Subscription Agent have or will have entered into a subscription agency agreement substantially in the form previously provided to the Dealer-Manager for review (the "**Subscription Agency Agreement**"). When executed by the Company, the Subscription Agency Agreement will have been duly authorized, executed and delivered by the Company and, assuming due authorization, execution and delivery by the Subscription Agent, will constitute a valid and legally binding agreement of the Company enforceable in accordance with its terms, except as the enforceability thereof may be limited by bankruptcy, insolvency, reorganization, moratorium or similar laws relating to or affecting creditors' rights generally, by general principles of equity, or by public policy.

(k) The Rights to be issued and distributed by the Company have been duly and validly authorized and, when issued and delivered in accordance with the terms of the Offer Documents, will be duly and validly issued, and will constitute valid and legally binding obligations of the Company enforceable against the Company in accordance with their terms. No holder of the Rights is or will be subject to personal liability by reason of being such a holder, and the Rights conform to the description thereof contained in the Prospectus.

(l) The Rights Warrants conform to the description thereof in the Registration Statement and in the Prospectus and, when issued and delivered by the Company in accordance with the terms of the Offer Documents, will be duly and validly issued, and will constitute valid and legally binding obligations of the Company enforceable against the Company in accordance with their terms. The Underlying Shares issuable upon exercise of the Rights Warrants have been duly authorized and reserved for issuance upon exercise of the Rights Warrants by all necessary corporate action on the part of the Company and, when issued and delivered and paid for upon such exercise in accordance with the terms of the Rights Warrants, will be validly issued, fully paid, nonassessable and free of preemptive rights and will conform to the description thereof in the Prospectus.

(m) Except as disclosed in the Prospectus with respect to the Company's authorized capitalization, the Rights Shares (including, for the avoidance of doubt, any Pre-Funded Warrants and the shares of Common Stock underlying such Pre-Funded Warrants) have been duly and validly authorized and reserved for issuance upon exercise of the Rights and are free of statutory and contractual preemptive rights and are sufficient in number to meet the exercise requirements of the Rights Offering; and Rights Shares, when so issued and delivered against payment therefor in accordance with the terms of the Rights Offering, will be duly and validly issued, fully paid and non-assessable and free of preemptive rights and will conform to the description thereof contained in the Prospectus.

(n) The Common Stock is listed for trading on the NASDAQ Capital Market ("**NASDAQ**"). Except as disclosed in the Registration Statement or applications, notices and correspondence in the ordinary course, the Company has not received an oral or written notification from NASDAQ or any court or any other federal, state, local or foreign governmental or regulatory authority having jurisdiction over the Company or any of its Subsidiaries or any of their properties or assets ("**Governmental Authority**") of any inquiry or investigation or other action that would cause the Common Stock, the Rights Shares or the

8

Rights Warrants to not be listed for trading on NASDAQ; provided that the Pre-Funded Warrants will not be listed for trading on NASDAQ.

(o) The Company has an authorized capitalization as set forth under the caption "Description of Securities" in the Prospectus, and all of the issued shares of capital stock of the Company have been duly and validly authorized and issued, are fully paid and non-assessable and have been issued in compliance with federal and state securities laws. None of the outstanding shares of the Company's capital stock were issued in violation of any preemptive

rights, rights of first refusal or other similar rights to subscribe for or purchase securities of the Company. There are no authorized or outstanding options, warrants, preemptive rights, rights of first refusal or other rights to purchase, or equity or debt securities convertible into or exchangeable or exercisable for, any capital stock of the Company or any of its subsidiaries other than those accurately described in the Registration Statement. The description of the Company's stock option, stock bonus and other stock plans or arrangements, and the options or other rights granted thereunder, set forth in the Registration Statement accurately and fairly presents in all material respects the information required to be shown with respect to such plans, arrangements, options and rights.

(p) The Company and its Subsidiaries own or lease all such assets or properties as are necessary to the conduct of its business as presently operated, as described in the Registration Statement and the Prospectus. The Company or its Subsidiaries have good and marketable title in fee simple to all assets or real property and good and marketable title to all personal property owned by them, in each case free and clear of any Lien, except for such (i) Liens as are described in the Registration Statement and the Prospectus, (ii) Liens as do not materially affect the value of such property and do not materially interfere with the use made and proposed to be made of such property by the Company and the Subsidiaries and (iii) Liens for the payment of federal, state or other taxes, for which appropriate reserves have been made in accordance with GAAP, and the payment of which is neither delinquent nor subject to penalties. Any assets or real property and buildings held under lease or sublease by the Company or any Subsidiary is held under valid, subsisting and enforceable leases with such exceptions as are not material to, and do not interfere with, the use made and proposed to be made of such property and buildings by the Company or such Subsidiary. Neither the Company nor any Subsidiary has received any notice of any material claim adverse to its ownership of any real or personal property or of any material claim against the continued possession of any real property, whether owned or held under lease or sublease by the Company or any Subsidiary.

(q) The Company and each of its Subsidiaries have all material consents, approvals, authorizations, orders, registrations, qualifications, licenses, filings and permits of, with and from all judicial, regulatory and other Governmental Authorities and all third parties, foreign and domestic (collectively, with the Licensing Requirements described below, the "**Consents**"), to own, lease and operate their properties and conduct their businesses as presently operated, as disclosed in the Registration Statement and the Prospectus, and, to the Company's knowledge, each such Consent is valid and in full force and effect. Except as disclosed in the Registration Statement, the Company has not received notice of any investigation or proceedings which results in or, if decided adversely to the Company, would reasonably be expected to result in, the revocation of any Consent or would reasonably be expected to have a Material Adverse

9

Effect. No Consent contains a materially burdensome restriction not adequately disclosed in the Registration Statement and the Prospectus.

(r) The execution, delivery and performance of this Agreement by the Company, the issuance of the Rights in accordance with the terms of the Offer Documents, the issuance of Units, Rights Shares (including, for the avoidance of doubt, any Pre-Funded Warrants and the shares of Common Stock underlying such Pre-Funded Warrants) and Rights Warrants in accordance with the terms of the Rights Offering, and the consummation by the Company of the transactions contemplated hereby and by the Subscription Agency Agreement, will not conflict with or result in a breach or violation of any of the terms or provisions of, or constitute a default under, any indenture, mortgage, deed of trust, loan agreement or other agreement or instrument to which the Company or any of its Subsidiaries or any of its Affiliates is a party or by which the Company or any of its Subsidiaries or its Affiliates is bound or to which any of the properties or assets of the Company or any of its Subsidiaries or its Affiliates is subject, nor will such actions result in any violation of the provisions of the charter or by-laws of the Company or any of its Subsidiaries or any statute or any order, rule or regulation of any Governmental Authority, except where such violation would not reasonably be expected to have a Material Adverse Effect; and except for the registration of the Rights, Rights Shares (including, for the avoidance of doubt, any Pre-Funded Warrants and the shares of Common Stock underlying such Pre-Funded Warrants) and the Rights Warrants under the Securities Act, such consents, approvals, authorizations, registrations or qualifications as may be required under the Exchange Act and applicable state securities laws in connection with the distribution of the Rights and the offer and sale of the Units, Rights Shares and Rights Warrants by the Company, and the listing of the Rights Shares and Rights Warrants for trading on NASDAQ (provided that the Pre-Funded Warrants will not be listed for trading on NASDAQ), no consent, approval, authorization or order of, or filing or registration with, any such court or Governmental Authority is required for the execution, delivery and performance of this Agreement by the Company and the consummation by it of the transactions contemplated hereby.

(s) Except as otherwise set forth in the Registration Statement, there are no contracts, agreements or understandings between the Company and any Person granting such Person the right to require the Company to file a registration statement under the Securities Act with respect to any securities of the Company owned or to be owned by such Person or to require the Company to include such securities in the securities registered pursuant to the Registration Statement or in any securities being registered pursuant to any other registration statement filed by the Company under the Securities Act. No holder of any security of the Company has any rights of rescission of similar rights with respect to such securities held by them.

(t) Neither the Company nor any of its Subsidiaries has sustained, since the date of the latest balance sheet included in the Prospectus or after such date and as disclosed in the Prospectus, any material loss or interference with its business from fire, explosion, flood or other calamity, whether or not covered by insurance, or from any labor dispute or court or governmental action, order or decree; and, since such date or after such date and as disclosed in the Prospectus, there has not been any change in the capital stock or long-term debt of the Company or any of its Subsidiaries or any material adverse change, or any development involving a prospective material adverse change, in or affecting the general affairs, management, financial position, stockholders' equity, results of operations or prospects (as such prospects are

10

disclosed or described in the Prospectus) of the Company and its Subsidiaries (a "**Material Adverse Change**"). Since the date of the latest balance sheet presented in the Prospectus, the Company has not incurred or undertaken any liabilities or obligations, whether direct or indirect, liquidated or contingent, matured or unmatured, or entered into any transactions, including any acquisition or disposition of any business or asset, which are material to the Company, except for liabilities, obligations and transactions which are disclosed in the Registration Statement, any Preliminary Prospectus and the Prospectus.

(u) Ernst & Young LLP ("**EY**"), whose reports relating to the Company are included in the Registration Statement, are independent public accountants as required by the Securities Act, the Exchange Act, the Rules and Regulations and the rules and regulations promulgated by the Public Company Accounting Oversight Board (the "**PCAOB**"). EY is duly registered and in good standing with the PCAOB. Except as disclosed in the Registration Statement, EY has not, during the periods covered by the financial statements included in the Registration Statement, the Preliminary Prospectus and the Prospectus, provided to the Company any non-audit services, as such term is used in Section 10A(g) of the Exchange Act.

(v) The financial statements, including the notes thereto, and any supporting schedules included in the Registration Statement, any Preliminary Prospectus and the Prospectus present fairly, in all material respects, the consolidated financial position as of the dates indicated and the consolidated cash flows and consolidated results of operations for the periods specified of the Company and its Subsidiaries. Except as otherwise stated in the Registration Statement, any Preliminary Prospectus and the Prospectus, said financial statements have been prepared in conformity with United States generally accepted accounting principles. Any supporting schedules included in the Registration Statement, any Preliminary Prospectus and the Prospectus present fairly, in all material respects, the information required to be stated therein. No other financial statements or supporting schedules are required to be included or incorporated by reference in the Registration Statement.

(w) There are no pro forma or as adjusted financial statements which are required to be included in the Registration Statement, any Preliminary Prospectus and the Prospectus in accordance with Regulation S-X under the Securities Act which have not been included as so required. The pro forma and/or as adjusted financial information included in the Registration Statement, any Preliminary Prospectus and the Prospectus has been properly compiled and prepared in accordance with the applicable requirements of the Securities Act and the Rules and Regulations and include all adjustments necessary to present fairly, in all material respects, in accordance with United States generally accepted accounting principles the pro forma and as adjusted consolidated financial position of the Company and its Subsidiaries at the respective dates indicated and their consolidated cash flows and consolidated results of operations for the respective periods specified. The assumptions used in preparing the pro forma and as adjusted financial information included in the Registration Statement, any Preliminary Prospectus and the Prospectus provide a reasonable basis for presenting the significant effects directly attributable to the transactions or events described therein. The related pro forma and pro forma as adjusted adjustments give appropriate effect to those assumptions; and the pro forma and pro forma as adjusted financial information reflect the proper application of those adjustments to the corresponding historical financial statement amounts.

11

(x) The statistical, industry-related and market-related data included in the Registration Statement, any Preliminary Prospectus and the Prospectus are based on or derived from sources which the Company reasonably believes are reliable and accurate, and such data agree with the sources from which they are derived. All required third party consents have been obtained in order for such data to be included in the Registration Statement, any Preliminary Prospectus and the Prospectus.

(y) Except as disclosed in the Registration Statement and the Prospectus, the Company maintains a system of internal accounting and other controls sufficient to provide reasonable assurances that: (i) transactions are executed in accordance with management's general or specific authorizations, (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with United States generally accepted accounting principles and to maintain accountability for assets, (iii) access to assets is permitted only in accordance with management's general or specific authorization, and (iv) the recorded accounting for assets is compared with existing assets at reasonable intervals and appropriate action is taken with respect to any differences.

(z) The Company's Board of Directors has validly appointed an audit committee and compensation committee whose composition satisfies the requirements of the rules and regulations of the Commission and NASDAQ and the Company, by action of its Board of Directors and/or the appropriate committee, has adopted an audit committee charter and a compensation committee charter, and such charters are in full force and effect as of the date hereof. Neither the Company's Board of Directors nor the audit committee thereof has been informed, nor is any director of the Company aware, of: (i) except as disclosed in the Registration Statement and the Prospectus, any significant deficiencies or material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the Company's ability to record, process, summarize and report financial information; or (ii) any fraud, whether or not material, that involves management or other employees who have a significant role in the Company's internal control over financial reporting.

(aa) The Company is in material compliance with the provisions of the Sarbanes-Oxley Act of 2002, as amended ("**Sarb-Ox**") applicable to the Company, and the rules and regulations promulgated thereunder, except for violations which, singly or in the aggregate, are disclosed in the Prospectus or would not have a Material Adverse Effect.

(bb) No relationship, direct or indirect, exists between or among any of the Company or any Affiliate of the Company, on the one hand, and any director, officer, shareholder, customer or supplier of the Company or any Affiliate of the Company, on the other hand, which is required by the Securities Act, the Exchange Act or the Rules and Regulations to be described in the Registration Statement or the Prospectus which is not so described as required. Except as disclosed in the Registration Statement and the Prospectus, there are no outstanding loans, advances (except normal advances for business expenses in the ordinary course of business) or guarantees of indebtedness by the Company to or for the benefit of any of the officers or directors of the Company or any of their respective family members. The Company has not, in violation of Sarb-Ox, directly or indirectly, including through any Affiliate of the Company (other than as permitted under the Sarb-Ox for depository institutions), extended

12

or maintained credit, arranged for the extension of credit, or renewed an extension of credit, in the form of a personal loan to or for any director or executive officer of the Company.

(cc) Except as described in the Registration Statement, there are no legal or governmental proceedings pending to which the Company or any of its Subsidiaries is a party or of which any property or asset of the Company or any of its Subsidiaries is the subject (it being understood that the interactions between the Company and Governmental Authorities relating to the clinical development and product approval process are not proceedings within the meaning of these representations), which, if determined adversely to the Company or any of its Subsidiaries, are reasonably likely to have a Material Adverse Effect; and to the best of the Company's knowledge, except as disclosed in the Registration Statement, no such proceedings are threatened or contemplated by Governmental Authorities or threatened by others.

(dd) The Company and its Subsidiaries have filed all necessary federal, state and foreign income and franchise tax returns and have paid all taxes required to be paid by any of them and, if due and payable, any related or similar assessment, fine or penalty levied against any of them, except where the failure to make such filings or make such payments, either individually or in the aggregate, could not reasonably be expected to have, a Material Adverse Effect. The Company has made adequate charges, accruals and reserves in its financial statements above in respect of all federal, state and foreign income and franchise taxes for all periods as to which the tax liability of the Company or any of its Subsidiaries has not been finally determined.

(ee) Each of the Company and its Subsidiaries maintains insurance of the types and in the amounts which the Company believes to be reasonable and sufficient for a company of its size operating in the Company's industry, including, but not limited to: (i) directors' and officers' insurance (including insurance covering the Company, its directors and officers for liabilities or losses arising in connection with the Rights Offering, including, without limitation, liabilities or losses arising under the Securities Act, the Exchange Act, the Rules and Regulations and applicable foreign securities laws), (ii) insurance covering real and personal property owned or leased against theft, damage, destruction, acts of vandalism and all other risks customarily insured against, (iii) business interruption insurance and (iv) product-related or clinical trial-related insurance. There are no material claims by the Company or any of its Subsidiaries under any policy or instrument described in this paragraph as to which any insurance company is denying liability or defending under a reservation of rights clause. All of the insurance policies described in this paragraph are in full force and effect. Neither the Company nor any of its Subsidiaries has been refused any insurance coverage sought or applied for, and the Company has no reason to believe that it will not be able to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage from similar insurers as may be necessary to continue its business at a cost that would not have a Material Adverse Effect.

(ff) Intellectual Property.

(i) The Company owns, licenses or possess the right to use sufficient trademarks, trade names, patents, patent rights, copyrights, domain names, licenses, approvals, trade secrets, inventions, technology, know-how and other similar rights (collectively, "**Intellectual Property Rights**") as are reasonably necessary or material to conduct its business

13

as now conducted and contemplated to be conducted, each as described in the Registration Statement, any Preliminary Prospectus and the Prospectus. To the Company's knowledge, all Intellectual Property Rights are valid and enforceable.

(ii) Except as set forth in the Registration Statement, any Preliminary Prospectus and the Prospectus: (A) there is no actual, pending or, to the Company's knowledge, threatened action, suit, proceeding, or claim by others challenging the rights of the Company and its Subsidiaries in or to any Intellectual Property Rights, and the Company is unaware of any facts which would form a reasonable basis for any such claim; (B) there is no actual, pending or, to the Company's knowledge, threatened action, suit, proceeding, or claim by others that the Company or its Subsidiaries infringes, misappropriates, or otherwise violates any Intellectual Property Rights of others, and the Company is unaware of any facts which would form a reasonable basis for any such claim; (C) there is no actual, pending or, to the Company's knowledge, threatened action, suit, proceeding, or claim by others challenging the validity or scope of any such Intellectual Property Rights owned by the Company or its Subsidiaries and the Company is unaware of any facts which would form a reasonable basis for any such claim; (D) to the Company's knowledge, the operation of Company's business as now conducted and in connection with the development and commercialization of its technology described in the Registration Statement, any Preliminary Prospectus and the Prospectus does not infringe any claim of any patent or published patent application, nor would such infringement, misappropriation or violation arise upon the commercialization of any product or service described in the Registration Statement, any Preliminary Prospectus and the Prospectus as under development; (E) to the Company's knowledge, there is no "prior art" of which the Company is aware that may render any patent owned or licensed by the Company invalid or any patent application owned or licensed by the Company or its Subsidiaries unpatentable which has not been disclosed to the applicable government patent office; and (F) the patents, trademarks, and copyrights maintained by the Company or its Subsidiaries are in full force and in effect, and none of such patents, trademarks and copyrights have been adjudged invalid or unenforceable in whole or in part. Neither the Company nor its Subsidiaries is a party to or bound by any options, licenses or agreements with respect to the Intellectual Property Rights of any other Person that are required to be set forth in the Registration Statement, any Preliminary Prospectus and Prospectus and are not described therein in all material respects.

(iii) The Company has duly and properly filed or caused to be filed with the U. S. Patent and Trademark Office (the "**PTO**") and applicable foreign and international patent authorities all patent applications owned by the Company or its Subsidiaries (the "**Company Patent Applications**"). The product candidates described in the Registration Statement, any Preliminary Prospectus and the Prospectus as under development by the Company fall within the scope of the claims of one or more patents or patent applications owned by, or exclusively licensed to, the Company. The Company has complied in all material respects with the PTO's duty of candor and disclosure for the Company Patent Applications and has made no material misrepresentation in the Company Patent Applications. The Company Patent Applications disclose patentable subject matters, and the Company has not been notified of any inventorship challenges nor has any interference been declared or provoked nor is any material fact known by the Company that would preclude the issuance of patents with respect to the Company Patent Applications or would render such patents invalid or unenforceable. No third party possesses rights to the Company's Intellectual Property Rights that, if exercised, could

14

enable such party to develop products competitive to those the Company intends to develop as described in the Prospectus.

(iv) Other than as disclosed in the Registration Statement, any Preliminary Prospectus and Prospectus, to the knowledge of the Company, there are no rulemaking or similar proceedings before the U.S. Food and Drug Administration ("**FDA**") or PTO which affect or involve the Company or any of the processes or technologies that the Company has developed, is developing or proposes to develop or uses or proposes to use which, if the subject of an action unfavorable to the Company, would result in a Material Adverse Change.

(v) The Company has obtained legally binding written agreements from all officers, employees and third parties with whom the Company has shared confidential proprietary information: (A) of the Company, or (B) received from others which the Company is obligated to treat as confidential, which agreements require such employees and third parties to keep such information confidential. The Company has taken all necessary actions to obtain ownership of all works of authorship and inventions made by its employees, consultants and contractors during the time they were employed by or under contract with the Company and which relate to the Company's business as currently conducted. All founders and current key employees have signed confidentiality and invention assignment agreements with the Company.

(vi) The Company possesses valid and current licenses, registrations, certificates, permits and other authorizations issued by the appropriate foreign, federal, state or local regulatory authorities as necessary to conduct its respective businesses (collectively, the "**Licensing Requirements**"), except where the failure of a Licensing Requirement would not have a Material Adverse Effect. The Company has not received any notice of proceedings relating to the revocation or modification of, or noncompliance with, any such license, certificate, permit or authorization, which could result

in a Material Adverse Effect. No action, suit or proceeding, other than routine audits, by or before any court or Governmental Authority or any arbitrator involving the Company with respect to the removal, revocation, suspension or other termination of the authority to operate under the Licensing Requirements is pending or, to the Company's knowledge, threatened. The Company does not believe that any pending audit is reasonably likely to result in the removal, revocation, suspension or other termination of the Company's authority to operate under the Licensing Requirements.

(vii) The consummation of the transactions contemplated by this Agreement will not result in the loss or impairment of or payment of any additional amounts with respect to, nor require the consent of any other person in respect of, the Company's right to own, use, or hold for use any of the Intellectual Property Rights as owned, used or held for use in the conduct of the business as currently conducted.

(viii) To the Company's knowledge, the Company has at all times complied with all applicable laws relating to privacy, data protection, and the collection and use of personal information collected, used, or held for use by the Company in the conduct of the Company's business. No claims have been asserted or threatened against the Company alleging a violation of any person's privacy or personal information or data rights and the consummation of the transactions contemplated hereby will not breach or otherwise cause any violation of any law

15

related to privacy, data protection, or the collection and use of personal information collected, used, or held for use by the Company in the conduct of the Company's business, except such claims as would not reasonably be likely to result in a Material Adverse Effect. The Company takes reasonable measures to ensure that such information is protected against unauthorized access, use, modification, or other misuse.

(gg) Except as described in any Preliminary Prospectus, the Prospectus and the Registration Statement, the Company: (i) is and at all times has been in full compliance with all statutes, rules, regulations or guidance applicable to the ownership, testing, development, manufacture, packaging, processing, use, distribution, marketing, labeling, promotion, sale, offer for sale, storage, import, export or disposal of any product manufactured, distributed or sold by the Company or any component thereof (such statutes, rules, regulations or guidance, collectively, "**Applicable Laws**"); (ii) is, and to the Company's knowledge, the Company's manufacturing facilities and operations of its suppliers are in compliance with all applicable federal, state, local and foreign laws, regulations, orders and decrees governing its business as prescribed by the FDA or any other applicable federal, state or foreign governmental authority agencies or bodies engaged in the regulation of pharmaceuticals or biohazardous substances or materials, (iii) has not received any notice of adverse finding, warning letter, untitled letter or other correspondence or notice from the FDA or any other Governmental Authority alleging or asserting noncompliance with any Applicable Laws or any licenses, certificates, approvals, clearances, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws ("**Authorizations**"); (iv) possesses all Authorizations and such Authorizations are valid and in full force and effect and are not in violation of any term of any such Authorizations; (v) has not received notice of any claim, suit, proceeding, hearing, enforcement, audit, investigation, arbitration or other action from any Governmental Authority or third party alleging that any product operation or activity is in violation of any Applicable Laws or Authorizations and has no knowledge that any such Governmental Authority or third party is considering any such claim, suit, proceeding, hearing, enforcement, audit, investigation, arbitration or other action; (vi) has not received notice that any Governmental Authority has taken, is taking or intends to take action to limit, suspend, modify or revoke any Authorizations and has no knowledge that any such Governmental Authority is considering such action; and (vii) has filed, obtained, maintained or submitted all material reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by any Applicable Laws or Authorizations and that all such material reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were complete and correct in all material respects on the date filed (or were corrected or supplemented by a subsequent submission), except, in the case of each of clauses (i), (ii), (iii), (iv) and (vii), for any default, violation or event that would not, individually or in the aggregate, have or reasonably be expected to have a Material Adverse Effect.

(hh) The studies, tests and trials conducted or sponsored by or on behalf of the Company that are described or referred to in any Preliminary Prospectus, the Prospectus and the Registration Statement (the "**Studies**") were and, if still pending, are being conducted in accordance with experimental protocols, procedures and controls pursuant to accepted professional scientific standards and all Applicable Laws and Authorizations; the descriptions of the results of such Studies contained in any Preliminary Prospectus, the Prospectus and the Registration Statement are accurate and complete in all material respects and fairly present the

16

data derived from such Studies. The Company is not aware of any studies, tests or trials, the results of which the Company believes reasonably call into question the Studies when viewed in the context in which such results are described. Except as disclosed in the Registration Statement, the Company has not received any notices or correspondence with the FDA or any foreign, state or local governmental body exercising comparable authority suggesting or requiring a clinical hold, termination, suspension or material modification of the Studies, and to the Company's knowledge there are no reasonable grounds for the same. The Company has obtained (or caused to be obtained) informed consent by or on behalf of each human subject who participated in Studies. In using or disclosing patient information received by the Company in connection with the Studies, the Company has complied in all material respects with all applicable laws and regulatory rules, including, without limitation, the Health Insurance Portability and Accountability Act of 1996 and the rules and regulations thereunder. To the Company's knowledge, none of the Studies involved any investigator who has been disqualified as a clinical investigator or has been found by the FDA to have engaged in scientific misconduct or debarred or excluded from participation in any governmental health care payment program.

(ii) Neither the Company nor, to the Company's knowledge, any of the Company's directors, officers or employees has violated: (i) the Bank Secrecy Act, as amended, (ii) the Money Laundering Control Act of 1986, as amended, (iii) the Foreign Corrupt Practices Act, or (iv) the Uniting and Strengthening of America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA PATRIOT ACT) Act of 2001, and/or the rules and regulations promulgated under any such law, or any successor law, except for such violations which, singly or in the aggregate, would not have a Material Adverse Effect.

(jj) Neither the Company nor any of its Affiliates has, prior to the date hereof, made any offer or sale of any securities which are required to be "integrated" pursuant to the Securities Act or the Rules and Regulations with the offer and sale of the Units, Rights Shares and Rights Warrants pursuant to the Registration Statement.

(kk) Transactions Affecting Disclosure to FINRA.

(i) Except as described in the Registration Statement and the Prospectus, there are no claims, payments, arrangements, agreements or understandings relating to the payment of a finder's, consulting or origination fee or other compensation by the Company with respect to the issuance or exercise of the Rights or the offer and sale of the Units, Rights Shares and Rights Warrants or any other arrangements, agreements or understandings of the Company or, to the Company's knowledge, the Company's officers, directors and employees or Affiliates that may affect the Dealer-Manager's compensation, as determined by the Financial Industry Regulatory Authority, Inc. ("**FINRA**").

(ii) Except as previously disclosed by the Company to the Dealer-Manager in writing, no officer, director, or beneficial owner of 5% or more of any class of the Company's securities (whether debt or equity, registered or unregistered, regardless of the time acquired or the source from which derived) or any other Affiliate is a member or a Person associated, or affiliated with a member of FINRA.

17

(iii) No proceeds from the exercise of the Rights will be paid to any FINRA member, or any Persons associated or affiliated with a member of FINRA, except as specifically contemplated herein.

(iv) Except as previously disclosed by the Company to the Dealer-Manager, no Person to whom securities of the Company have been privately issued within the 180-day period prior to the initial filing date of the Registration Statement has any relationship or affiliation or association with any member of FINRA.

(ll) There are no contracts, agreements or understandings between the Company and any Person that would give rise to a valid claim against the Company or the Dealer-Manager for a brokerage commission, finder's fee or other like payment in connection with the transactions contemplated by this Agreement. Other than the Dealer-Manager, the Company has not employed any brokers, dealers or underwriters in connection with solicitation of exercise of Rights in the Rights Offering, and except provided for in Sections 6 and 7 hereof, no other commissions, fees or discounts will be paid by the Company or otherwise in connection with the Rights Offering.

(mm) The Company and its Subsidiaries have at all times operated their businesses in material compliance with all Environmental Laws, and no material expenditures are or will be required in order to comply therewith. The Company has not received any notice or communication that relates to or alleges any actual or potential violation or failure to comply with any Environmental Laws that will result in a Material Adverse Effect. As used herein, the term "Environmental Laws" means all applicable laws and regulations, including any licensing, permits or reporting requirements, and any action by a Governmental Authority pertaining to the protection of the environment, protection of public health, protection of worker health and safety, or the handling of hazardous materials, including without limitation, the Clean Air Act, 42 U.S.C. § 7401, et seq., the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601, et seq., the Federal Water Pollution Control Act, 33 U.S.C. § 1321, et seq., the Hazardous Materials Transportation Act, 49 U.S.C. § 1801, et seq., the Resource Conservation and Recovery Act, 42 U.S.C. § 690-1, et seq., and the Toxic Substances Control Act, 15 U.S.C. § 2601, et seq.

(nn) Except as set forth in the Registration Statement, any Preliminary Prospectus or the Prospectus, the Company is not a party to an "employee benefit plan," as defined in Section 3(3) of the Employee Retirement Income Security Act of 1974 ("**ERISA**") which: (i) is subject to any provision of ERISA and (ii) is or was at any time maintained, administered or contributed to by the Company and covers any employee or former employee of the Company or any ERISA Affiliate (as defined hereafter). These plans are referred to collectively herein as the "**Employee Plans**." For purposes of this paragraph, "**ERISA Affiliate**" of any Person means any other person or entity which, together with that person or entity, could be treated as a single employer under Section 414(m) of the Internal Revenue Code of 1986, as amended (the "**Code**"), or is an "affiliate," whether or not incorporated, as defined in Section 407(d)(7) of ERISA, of the Person.

(oo) Each employment, severance or other similar arrangement or policy and each material plan or arrangement providing for insurance coverage (including any self-insured

18

arrangements), workers' compensation, disability benefits, severance benefits, supplemental unemployment benefits, vacation benefits, retirement benefits or for deferred compensation, profit-sharing, bonuses, stock options, stock appreciation or other forms of incentive compensation, or post-retirement insurance, compensation or benefits to which the Company or any Subsidiary is a party and which: (i) is not an Employee Plan, (ii) is entered into, maintained or contributed to, as the case may be, by the Company or any of their respective ERISA Affiliates, and (iii) covers any employee or former employee of the Company or any of their respective ERISA Affiliates (such contracts, plans and arrangements being referred to collectively in this Agreement as the "**Benefit Arrangements**") is fully and accurately disclosed in the Registration Statement to the extent it is material and required to be disclosed by the Securities Act and the Rules and Regulations and has been maintained in substantial compliance with its terms and with requirements prescribed by any and all statutes, orders, rules and regulations that are applicable to that Benefit Arrangement.

(pp) Except as set forth in the Registration Statement, any Preliminary Prospectus or the Prospectus, there is no liability in respect of post-retirement health and medical benefits for retired employees of the Company or any of their respective ERISA Affiliates other than medical benefits required to be continued under applicable law, determined using assumptions that are reasonable in the aggregate, over the fair market value of any fund, reserve or other assets segregated for the purpose of satisfying such liability (including for such purposes any fund established pursuant to Section 401(h) of the Code). With respect to any of the Company's Employee Plans which are "group health plans" under Section 4980B of the Code and Section 607(1) of ERISA, there has been material compliance with all requirements imposed there under such that the Company or their respective ERISA Affiliates have no (and will not incur any) loss, assessment, tax penalty, or other sanction with respect to any such plan.

(qq) The execution of this Agreement and consummation of the Rights Offering does not constitute a triggering event under any Employee Plan or any other employment contract, whether or not legally enforceable, which (either alone or upon the occurrence of any additional or subsequent event) will or may result in any payment (of severance pay or otherwise), acceleration, increase in vesting, or increase in benefits to any current or former participant, employee or director of the Company.

(rr) No "prohibited transaction" (as defined in either Section 406 of the ERISA or Section 4975 of Code), "accumulated funding deficiency" (as defined in Section 302 of ERISA) or other event of the kind described in Section 4043(b) of ERISA (other than events with respect to which

the 30-day notice requirement under Section 4043 of ERISA has been waived) has occurred with respect to any employee benefit plan for which the Company would have any liability; each employee benefit plan of the Company is in compliance in all material respects with applicable law, including (without limitation) ERISA and the Code; the Company has not incurred and does not expect to incur liability under Title IV of ERISA with respect to the termination of, or withdrawal from any "pension plan"; and each employee benefit plan of the Company that is intended to be qualified under Section 401(a) of the Code is so qualified and nothing has occurred, whether by action or by failure to act, which could cause the loss of such qualification.

19

(ss) Neither the Company nor, to the Company's knowledge, any of the Company's officers, directors, employees or agents has at any time during the last five (5) years: (i) made any unlawful contribution to any candidate for foreign office, or failed to disclose fully any contribution in violation of law; or (ii) made any payment to any federal or state governmental officer or official, or other Person charged with similar public or quasi-public duties, other than payments that are not prohibited by the laws of the United States of any jurisdiction thereof.

(tt) The Company has not and will not, directly or indirectly through any officer, director or Affiliate of the Company or through any other Person: (i) taken any action designed to cause or to result in, or that has constituted or which might reasonably be expected to constitute, the stabilization or manipulation of the price of any security of the Company to facilitate the issuance of the Rights or the sale or resale of the Rights Shares; (ii) since the filing of the Registration Statement sold, bid for or purchased, or paid any Person (other than the Dealer-Manager) any compensation for soliciting exercises or purchases of, the Rights or the Rights Shares; and (iii) until the later of the expiration of the Rights or the completion of the distribution (within the meaning of Regulation M under the Exchange Act) of the Rights Shares, sell, bid for or purchase, apply or agree to pay to any Person (other than the Dealer-Manager) any compensation for soliciting another to purchase any other securities of the Company (except for the solicitation of the exercises of Rights pursuant to this Agreement). The foregoing shall not apply to the offer, sale, agreement to sell or delivery with respect to: (i) the Units, Rights Shares and Rights Warrants offered and sold upon exercise of the Rights, as described in the Prospectus; or (ii) any shares of Common Stock sold pursuant to the Company's employee benefit plans.

(uu) As used in this Agreement, references to matters being "material" with respect to the Company or any matter relating to the Company shall mean a material item, event, change, condition, status or effect related to the condition (financial or otherwise), properties, assets (including intangible assets), liabilities, business, prospects (as such prospects are disclosed or described in any Preliminary Prospectus or the Prospectus), operations or results of operations of the Company and its Subsidiaries, taken as a whole.

(vv) As used in this Agreement, the term "knowledge of the Company" (or similar language) shall mean the knowledge of the officers of the Company who are named in the Prospectus, with the assumption that such officers shall have made reasonable and diligent inquiry of the matters presented (with reference to what is customary and prudent for the applicable individuals in connection with the discharge by the applicable individuals of their duties as officers or directors of the Company).

(ww) Any certificate signed by or on behalf of the Company and delivered to the Dealer-Manager or to Lowenstein Sandler LLP, counsel for the Dealer-Manager, shall be deemed to be a representation and warranty by the Company to the Dealer-Manager as to the matters covered thereby.

6. Compensation of the Dealer-Manager. In consideration of the services rendered and to be rendered by the Dealer-Manager to the Company in connection with the Rights Offering, the Company agrees to pay the Dealer-Manager the following:

20

(a) a cash fee equal to 4.5% of the dollar amount of the Units sold by the Company to any holders of Rights who were beneficial owners of shares of Common Stock prior to July 30, 2013, pursuant to the exercise of the Rights;

(b) a cash fee equal to 8.0% of the dollar amount of the Units sold by the Company to holders of Rights other than those identified in paragraph (a) above pursuant to the exercise of the Rights; and

(c) upon completion of the Rights Offering, a non-accountable expense allowance equal to the lesser of (i) \$100,000 or (ii) 3% of the gross proceeds to the Company in the Rights Offering.

In addition to the foregoing amounts, at the Closing, the Dealer-Manager shall reimburse to the Company the \$30,000 advance that was previously paid to the Dealer-Manager, pursuant to the Engagement Letter, as an advance against out-of-pocket accountable expenses anticipated to be incurred in connection with the Rights Offering. If the Rights Offering is not completed, the portion of such \$30,000 advance that is not used for such actual out-of-pocket-expenses shall be promptly reimbursed to the Company pursuant to the Engagement Letter.

7. Expenses. The Company shall pay or cause to be paid:

(a) all of its expenses (including any taxes) incurred in connection with the Rights Offering and the preparation, issuance, execution, authentication and delivery of the Rights and the Units, Rights Shares and Rights Warrants;

(b) all fees, expenses and disbursements of the Company's accountants, legal counsel and other third party advisors;

(c) all fees and expenses of the Subscription Agent;

(d) all fees, expenses and disbursements (including, without limitation, fees and expenses of the Company's accountants and counsel) in connection with the preparation, printing, filing, delivery and shipping of the Registration Statement (including the financial statements therein and all amendments and exhibits thereto), each Preliminary Prospectus, the Prospectus, the other Offer Documents and any amendments or supplements of the foregoing;

(e) all fees, expenses and disbursements relating to the registration or qualification of the Rights and the Rights Shares under the "blue sky" securities laws of any states or other jurisdictions and all fees and expenses associated with the preparation of the preliminary and final forms of Blue

- (f) all filing fees of the Commission;
- (g) all filing fees relating to the review of the Rights Offering by FINRA;
- (h) any applicable listing or other fees;

- (i) the cost of printing any certificates representing the Rights and the Rights Shares and Rights Warrants;
- (j) any advertising charges pertaining to the Rights Offering agreed by the Company;
- (k) the cost and charges of the Company's transfer agent(s) or registrar(s); and
- (l) all other costs and expenses incident to the performance of its obligations hereunder for which provision is not otherwise made in this Section.

The Company shall perform its obligations set forth in this Section 7 whether or not the Rights Offering commences or any Rights are exercised pursuant to the Rights Offering.

8. Shareholder Lists; Subscription Agent.

(a) The Company will cause the Dealer-Manager to be provided with any cards or lists showing the names and addresses of, and the number of shares of Common Stock held by, the holders of shares of Common Stock as of a recent date and will use its best efforts to cause the Dealer-Manager to be advised from time to time during the period, as the Dealer-Manager shall request, of the Rights Offering as to any transfers of record of shares of Common Stock.

(b) The Company will arrange for the Subscription Agent to advise the Dealer-Manager daily as to such matters as they may reasonably request, including the number of Rights which have been exercised pursuant to the Rights Offering.

9. Covenants. The Company covenants and agrees with the Dealer-Manager:

(a) To use its best efforts to cause the Registration Statement and any amendments thereto to become effective, provided that the Company shall have the right to discontinue the Rights Offering and withdraw the Registration Statement if the Company's Board of Directors determines in good faith that the Rights Offering is no longer in the best interests of the Company and its stockholders; to advise the Dealer-Manager, promptly after it receives notice thereof, of the time when the Registration Statement, or any amendment thereto, becomes effective or any supplement to the Prospectus or any amended Prospectus has been filed and to furnish the Dealer-Manager with copies thereof; to prepare a Prospectus in a form approved by the Dealer-Manager (such approval not to be unreasonably withheld or delayed) and to file such Prospectus pursuant to Rule 424(b) under the Securities Act within the time prescribed by such rule; to advise the Dealer-Manager, promptly after it receives notice thereof, of the issuance by the Commission of any stop order or of any order preventing or suspending the use of any Preliminary Prospectus or the Prospectus, of the suspension of the qualification of the Rights for offering or sale in any jurisdiction, of the initiation or threatening of any proceeding for any such purpose, or of any request by the Commission for the amending or supplementing of the Registration Statement or the Prospectus or for additional information; and, in the event of the issuance of any stop order or of any order preventing or suspending the use of any Preliminary Prospectus or the Prospectus or suspending any such qualification, to use promptly its reasonable best efforts to obtain its withdrawal;

(b) To deliver promptly to the Dealer-Manager in New York City such number of the following documents as the Dealer-Manager shall reasonably request: (i) conformed copies of the Registration Statement as originally filed with the Commission and each amendment thereto (in each case excluding exhibits other than this Agreement, any other Offer Documents filed as exhibits, the computation of the ratio of earnings to fixed charges and the computation of per share earnings); (ii) each Preliminary Prospectus, the Prospectus and any amended or supplemented Prospectus; and (iii) any document incorporated by reference in the Prospectus (excluding exhibits thereto); and, if the delivery of a prospectus is required at any time during which the Prospectus relating to the Units, Rights or the Rights Shares or Rights Warrants is required to be delivered under the Securities Act and if at such time any events shall have occurred as a result of which the Prospectus as then amended or supplemented would include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made when such Prospectus is delivered, not misleading, or, if for any other reason it shall be necessary during such period to amend or supplement the Prospectus or to file under the Exchange Act any document incorporated by reference in the Prospectus in order to comply with the Securities Act or the Exchange Act, to notify the Dealer-Manager and, upon its request, to file such document and to prepare and furnish without charge to the Dealer-Manager as many copies as the Dealer-Manager may from time to time reasonably request of an amended or supplemented Prospectus which will correct such statement or omission or effect such compliance;

(c) To file promptly with the Commission any amendment to the Registration Statement or the Prospectus or any supplement to the Prospectus that may, in the judgment of the Company or the Dealer-Manager, be necessary or advisable in connection with the distribution of the Rights or the offer and sale of the Units, Rights Shares and Rights Warrants or be requested by the Commission;

(d) Prior to filing with the Commission any: (i) Preliminary Prospectus, (ii) amendment to the Registration Statement, any document incorporated by reference in the Prospectus or (iii) any Prospectus pursuant to Rule 424 of the Rules and Regulations, to furnish a copy thereof to the Dealer-Manager and counsel for the Dealer-Manager and obtain the consent of the Dealer-Manager to the filing (which consent shall not be unreasonably withheld);

(e) For the period following the Effective Date until the completion of the Rights Offering, to furnish to the Dealer-Manager copies of all materials not available via EDGAR furnished by the Company to its shareholders and all public reports and all reports and financial statements furnished by the Company to the principal national securities exchange upon which any of the Company's securities may be listed pursuant to requirements of or agreements with such exchange or to the Commission pursuant to the Exchange Act or any rule or regulation of the Commission thereunder;

(f) To qualify or register the Rights and the Units, Rights Shares and Rights Warrants for sale under (or obtain exemptions from the application of) the state securities or blue sky laws of those jurisdictions designated by the Dealer-Manager, to comply with such laws and to continue such qualifications, registrations and exemptions in effect so long as required for the distribution of the Rights and the Units, Rights Shares and Rights Warrants; provided, however,

23

that the Company shall not be required to qualify as a foreign corporation or to take any action that would subject it to general service of process in any such jurisdiction where it is not presently qualified or where it would be subject to taxation as a foreign corporation. The Company will advise the Dealer-Manager promptly of the suspension of the qualification or registration of (or any such exemption relating to) the Rights and the Units, Rights Shares and Rights Warrants for offering, sale or trading in any jurisdiction or any initiation or threat of any proceeding for any such purpose, and in the event of the issuance of any order suspending such qualification, registration or exemption, the Company shall use its best efforts to obtain the withdrawal thereof at the earliest possible moment.

(g) To apply the net proceeds from the exercise of the Rights in the manner described under the caption "Use of Proceeds" in the Prospectus.

(h) Prior to the Effective Date, to apply for the listing of the Rights Shares and Rights Warrants on NASDAQ and to use its best efforts to complete that listing, subject only to official notice of issuance (if applicable), and, with respect to the Rights Warrants, confirmation that a sufficient number of Rights have been exercised to cause a sufficient number of Rights Warrants to be issued to the number of holders necessary to meet the listing standards of NASDAQ Rule 5515, as applicable, prior to the expiration of the Rights Offering; provided that the Pre-Funded Warrants will not be listed for trading on NASDAQ.

(i) To take such steps as shall be necessary to ensure that neither the Company nor any Subsidiary shall become an "investment company" within the meaning of such term under the Investment Company Act of 1940 and the rules and regulations of the Commission thereunder.

(j) To advise the Dealer-Manager, directly or through the Subscription Agent, from time to time, as the Dealer-Manager shall request, of the number of Units, Rights Shares and Rights Warrants subscribed for, and arrange for the Subscription Agent to furnish the Dealer-Manager with copies of written reports it furnishes to the Company concerning the Rights Offering;

(k) To commence mailing the Offer Documents to record holders of the Common Stock not later than the second business day following the record date for the Rights Offering, and complete such mailing as soon as practicable;

(l) To reserve and keep available for issue upon the exercise of the Rights such number of authorized but unissued shares of Common Stock as will be sufficient to permit the exercise in full of all Rights and all Rights Warrants issued upon such exercise in full, except as otherwise contemplated by the Prospectus; and

(m) To not take, directly or indirectly, any action designed to cause or to result in, or that has constituted or which might reasonably be expected to constitute, the stabilization or manipulation of the price of any security of the Company to facilitate the issuance of the Rights or the sale or resale of the Units, Rights Shares (including, for the avoidance of doubt, any Pre-Funded Warrants and the shares of Common Stock underlying such Pre-Funded Warrants) or Rights Warrants.

24

(n) From the date hereof until 90 days after the date of the Closing, neither the Company nor any Subsidiary shall issue, enter into any agreement to issue or announce the issuance or proposed issuance of any shares of Common Stock or Common Stock Equivalents (as defined below) without the written consent of Maxim. Notwithstanding the foregoing, this Section 9(n) shall not apply in respect of any issuance of (A) Common Stock under the Company's At-The Market Offering Program for the issuance and sale of the Company's Common Stock having an aggregate offering price of up to \$16,500,000 (the "ATM Program") pursuant to that certain Purchase Agreement, dated as of October 8, 2015, by and between the Company and Lincoln Park Capital Fund, LLC; (B) equity awards, and Common Stock issuable upon exercise or vesting of equity awards, to directors, officers, employees, consultants or new hires of the Company; (C) shares of Common Stock issued upon the conversion or exercise of Common Stock Equivalents; (D) the Rights Shares (including, for the avoidance of doubt, any Pre-Funded Warrants and the shares of Common Stock underlying such Pre-Funded Warrants); (E) the Rights Warrants; (F) the shares of Common Stock underlying the Rights Warrants; (G) Common Stock or Common Stock Equivalents to any distributor, supplier, manufacturer, licensor or licensee of the Company's products or services; and (H) Common Stock or Common Stock Equivalents in connection with any acquisitions, partnerships or strategic transactions, which in the case of each clause of this subsection (H) are approved by a majority of the disinterested directors of the Company, provided that any such issuance shall only be to a person which is, itself or through its subsidiaries, an operating company or an owner of an asset in a business synergistic with the business of the Company and shall provide to the Company additional benefits in addition to the investment of funds, but shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital or to an entity whose primary business is investing in securities. As used herein, "Common Stock Equivalents" shall mean any security of the Company or any other entity that is convertible into, or exercisable or exchangeable for, Common Stock, or any warrant or other right to purchase Common Stock or any other security of the Company or any other entity that is convertible into, or exercisable or exchangeable for, Common Stock.

10. Conditions of Dealer-Manager's Obligations. The obligations of the Dealer-Manager hereunder are subject to (and the occurrence of any Closing shall be conditioned upon) the accuracy, as of the date hereof and at all times during the Rights Offering, of the representations and warranties of the Company contained herein, to the performance by the Company of its obligations hereunder (in each case in the reasonable opinion of the Dealer-Manager) and to the following additional conditions:

(a) (i) The Registration Statement shall have become effective and the Prospectus shall have been timely filed with the Commission in accordance with the Rules and Regulations; (ii) all post-effective amendments to the Registration Statement shall have become effective; and (iii) no stop order suspending the effectiveness of the Registration Statement or any amendment or supplement thereto shall have been issued and no proceedings for the issuance of any such order shall have been initiated or threatened, and any request of the Commission for additional information (to be included in the Registration Statement or the Prospectus or otherwise) shall have been disclosed to the Dealer-Manager and complied with to the Dealer-Manager's reasonable satisfaction.

25

(b) The Dealer-Manager shall not have been advised by the Company or shall have discovered and disclosed to the Company that the Registration Statement or the Prospectus or any amendment or supplement thereto, contains an untrue statement of fact which in the Dealer-Manager's opinion, or in the opinion of counsel to the Dealer-Manager, is material, or omits to state a fact which, in the Dealer-Manager's opinion, or in the opinion of counsel to the Dealer-Manager, is material and is required to be stated therein or is necessary to make the statements therein not misleading.

(c) All corporate proceedings and other legal matters incident to the authorization, form and validity of this Agreement, the Rights, the Units, the Rights Shares (including, for the avoidance of doubt, any Pre-Funded Warrants and the shares of Common Stock underlying such Pre-Funded Warrants), the Rights Warrants, the Registration Statement and the Prospectus, and all other legal matters relating to this Agreement and the transactions contemplated hereby shall be reasonably satisfactory in all material respects to counsel for the Dealer-Manager, and the Company shall have furnished to such counsel all documents and information that they may reasonably request to enable them to pass upon such matters.

(d) Concurrently with the execution of this Agreement, there shall have been furnished to the Dealer-Manager the signed opinion (addressed to the Dealer-Manager) of Pepper Hamilton LLP counsel for the Company, dated the date hereof and in form and substance satisfactory to counsel for the Dealer-Manager.

(e) Concurrently with the execution of this Agreement, there shall have been furnished to the Dealer-Manager the signed opinion (addressed to the Dealer-Manager) of Khalilian Sira, LLC, intellectual property counsel for the Company, dated the date hereof and in form and substance satisfactory to counsel for the Dealer-Manager.

(f) Concurrently with the execution of this Agreement, the Company shall have furnished to the Dealer-Manager a letter of EY, addressed to the Dealer-Manager and dated the date hereof: (i) confirming that they are independent registered public accountants of the Company within the meaning of the Securities Act and are in compliance with the applicable requirements relating to the qualification of accountants under the PCAOB and applicable rules of the Commission, and (ii) stating, as of the date of the letter (or, with respect to matters involving changes or developments since the respective dates as of which specified financial information is given in the Prospectus, as of a date not more than five days prior to the date of the letter), the conclusions and findings of such firm with respect to the financial information and other matters specified by the Dealer-Manager.

(g) The Company shall have furnished to the Dealer-Manager a certificate, dated the date hereof and of such Closing, of its principal executive officer and its principal financial officer stating that:

(i) To the best of their knowledge after reasonable investigation, the representations, warranties, covenants and agreements of the Company in Section 5 hereof are true and correct in all material respects;

(ii) The conditions set forth in this Section 10 have been fulfilled;

26

(iii) Neither the Company nor any of its Subsidiaries has sustained any material loss or interference with its business, whether or not covered by insurance, or from any labor dispute or any legal or governmental proceeding;

(iv) Subsequent to the respective dates as of which information is given in the Registration Statement and the Prospectus, there has not been any Material Adverse Change or any development involving a prospective Material Adverse Change; and

(v) They have carefully examined the Registration Statement and the Prospectus and, in their opinion (A) the Registration Statement and the Prospectus, as of the Effective Date, did not include any untrue statement of a material fact and did not omit to state any material fact required to be stated therein or necessary to make the statements therein not misleading, and (B) since the Effective Date no event has occurred which should have been set forth in a supplement or amendment to the Registration Statement or the Prospectus and has not been.

(h) The Company shall have furnished to the Dealer-Manager and its counsel such additional documents, certificates and evidence as the Dealer-Manager or its counsel may have reasonably requested.

(i) The Company and its Subsidiaries shall not have sustained since the date of the latest audited financial statements included in the Prospectus any Material Adverse Change, the effect of which is, in the judgment of the Dealer-Manager, so material and adverse as to make it impracticable or inadvisable to proceed with the Rights Offering.

(j) NASDAQ shall have approved the Rights Shares and Rights Warrants for listing, subject only to official notice of issuance and, with respect to the Rights Warrants, confirmation that a sufficient number of Rights have been exercised to cause a sufficient number of Rights Warrants to be issued to the number of holders necessary to meet the listing standards of NASDAQ Rule 5515, as applicable; provided that the Pre-Funded Warrants will not be listed for trading on NASDAQ.

(k) All opinions, letters, evidence and certificates mentioned above or elsewhere in this Agreement shall be deemed to be in compliance with the provisions hereof only if they are in form and substance reasonably satisfactory to counsel for the Dealer-Manager. If any of the conditions specified in this Section 10 shall not have been fulfilled when and as required by this Agreement, this Agreement and all obligations of the Dealer-

Manager hereunder may be canceled at, or at any time during the Rights Offering, by the Dealer-Manager. Any such cancellation shall be without liability of the Dealer-Manager to the Company. Notice of such cancellation shall be given to the Company in writing, or by telephone and confirmed in writing.

11. Indemnification and Contribution.

(a) The Company agrees to hold harmless and indemnify each of Maxim and its affiliates and any officer, director, employee or agent of Maxim or any such affiliates and any Person controlling (within the meaning of Section 20(a) of the Exchange Act) Maxim or any of such affiliates from and against any and all (A) losses, claims, damages and liabilities whatsoever, under the Securities Act or otherwise (as incurred or suffered), arising out of or

27

based upon: (i) any untrue statement or alleged untrue statement of a material fact contained in the Offer Documents or any amendment or supplement thereto, in any other solicitation material used by the Company or authorized by it for use in connection with the Rights Offering, or in any blue sky application or other document prepared or executed by the Company (or based on any written information furnished by the Company) specifically for the purpose of qualifying any or all of the Rights or the Rights Shares or Rights Warrants under the securities laws of any state or other jurisdiction (any such application, document or information being hereinafter called a “Blue Sky Application”) or arising out of or based upon the omission or alleged omission to state in any such document a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading (other than statements or omissions made in reliance upon and in conformity with the Dealer-Manager Information); (ii) except in accordance with Section 12(c) hereof, any withdrawal or termination by the Company of, or failure by the Company to make or consummate, the Rights Offering, (iii) actions taken or omitted to be taken by an indemnified party with the consent of the Company or in conformity with actions taken by the Company; (iv) any failure by the Company to comply with any agreement or covenant contained in this Agreement; or (v) arising out of, relating to or in connection with or alleged to arise out of, relate to or be in connection with, the Rights Offering, any of the other transactions contemplated thereby or the performance of Maxim’s services to the Company with respect to the Rights Offering, and (B) all reasonable expenses (including, but not limited to, any and all reasonable legal expenses) incurred in connection with investigating, preparing to defend or defending any lawsuit, claim or other proceeding, commenced or threatened, whether or not resulting in any liability, which legal or other expenses shall be reimbursed by the Company promptly after receipt of any invoices therefore from Maxim. However, the Company will not be obligated to indemnify an indemnified party for any loss, claim, damage, liability or expense pursuant to the preceding sentence which has been determined in a final judgement by a court of competent jurisdiction to have resulted from the willful misconduct or gross negligence on the part of any indemnified party.

(b) The Dealer-Manager shall indemnify and hold harmless the Company, its officers, directors and employees, each of its directors and each Person, if any, who controls the Company within the meaning of the Securities Act, from and against any loss, claim, damage or liability, joint or several, or any action in respect thereof, to which the Company or any such director, officer or controlling Person may become subject, under the Securities Act or otherwise, insofar as such loss, claim, damage, liability or action arises out of, or is based upon: (i) any untrue statement or alleged untrue statement of a material fact contained (A) in any Offer Documents, or in any such amendment or supplement, in any other solicitation material used by the Company or authorized by it for use in connection with the Rights Offering or (B) in any Blue Sky Application; or (ii) the omission or alleged omission to state in any Offer Documents, or in any such amendment or supplement, in any other solicitation material used by the Company or authorized by it for use in connection with the Rights Offering, or in any Blue Sky Application, any material fact required to be stated therein or necessary to make the statements therein not misleading, but in each case solely and exclusively to the extent that the untrue statement or alleged untrue statement or omission or alleged omission was made in reliance upon and in conformity with the Dealer-Manager Information, and shall reimburse the Company and any such director, officer or controlling Person for any legal or other expenses reasonably incurred by the Company or any such director, officer or controlling Person in connection with

28

investigating or defending or preparing to defend against any such loss, claim, damage, liability or action as such expenses are incurred.

(c) If any lawsuit, claim or proceeding is brought against any indemnified party in respect of which indemnification may be sought against the indemnifying party pursuant to this Section 11, such indemnified party shall promptly notify the indemnifying party of the commencement of such lawsuit, claim or proceeding; provided, however, that the failure so to notify the indemnifying party shall not relieve the indemnifying party from any obligation or liability which it may have under this Section 11 except to the extent that it has been prejudiced in any material respect by such failure and in any event shall not relieve the indemnifying party from any other obligation or liability which it may have to such indemnified party otherwise than under this Section 11. In case any such lawsuit, claim or proceeding shall be brought against any indemnified party and such indemnified party shall notify the indemnifying party of the commencement of such lawsuit, claim or proceeding, the indemnifying party shall be entitled to participate in such lawsuit, claim or proceeding, and, after written notice from the indemnifying party to such indemnified party, to assume the defense of such lawsuit, claim or proceeding with counsel of its choice at its expense; provided, however, that such counsel shall be satisfactory to the indemnified party in the exercise of its reasonable judgment. Notwithstanding the election of the indemnifying party to assume the defense of such lawsuit, claim or proceeding, such indemnified party shall have the right to employ separate counsel and to participate in the defense of such lawsuit, claim or proceeding, and the indemnifying party shall bear the reasonable fees, costs and expenses of such separate counsel (and shall pay such reasonable fees, costs and expenses promptly after receipt of any invoice therefor) if: (i) the use of counsel chosen by the indemnifying party to represent such indemnified party would present such counsel with a conflict of interest; (ii) the defendants in, or targets of, any such lawsuit, claim or proceeding include both an indemnified party and the indemnifying party, and such indemnified party shall have reasonably concluded that there may be legal defenses available to it or to other indemnified parties which are different from or in addition to those available to the indemnifying party (in which case the indemnifying party shall not have the right to direct the defense of such action on behalf of the indemnified party); (iii) the indemnifying party shall not have employed counsel satisfactory to such indemnified party, in the exercise of such indemnified party’s reasonable judgment, to represent such indemnified party within a reasonable time after notice of the institution of any such lawsuit, claim or proceeding; or (iv) the indemnifying party shall authorize such indemnified party to employ separate counsel at the expense of the indemnifying party. The foregoing indemnification commitments shall apply whether or not the indemnified party is a formal party to any such lawsuit, claim or proceeding. The indemnifying party shall not be liable for any settlement of any lawsuit, claim or proceeding effected without its consent (which consent will not be unreasonably withheld), but if settled with such consent, the indemnifying party agrees, subject to the provisions of this Section 11, to indemnify the indemnified party from and against any loss, damage or liability by reason of such settlement. The Company agrees to notify Maxim promptly, or cause Maxim to be notified promptly, of the assertion of any lawsuit, claim or proceeding against the Company, any of its officers or directors or any Person who controls any of the foregoing within the meaning of Section 20(a) of the Exchange Act, arising out of or relating the Rights Offering. The Company further agrees that any settlement of a lawsuit, claim or proceeding against it arising out of Rights Offering shall include an explicit and unconditional release from the parties bringing such lawsuit, claim

or proceeding of Maxim, its affiliates, and any officer, director, employee or agent of Maxim, and any Person controlling (within the meaning of Section 20(a) of the Exchange Act) Maxim.

(d) The amount paid or payable by an indemnified party as a result of the losses, claims, damages, liabilities or expenses referred to in the immediately preceding paragraph shall be deemed to include, subject to the limitations set forth above, any legal or other expenses reasonably incurred by such indemnified party in connection with investigating, preparing to defend or defending any such action or claim.

(e) The foregoing rights to indemnification and contribution shall be in addition to any other rights which any indemnified parties may have under common law or otherwise but shall supersede, amend and restate, retroactively, the rights to indemnification, reimbursement and contribution provided for under the Engagement Letter.

(f) In order to provide for contribution in circumstances in which the indemnification provided for in this Section 11 for any reason held to be unavailable from any indemnifying party or is insufficient to hold harmless a party indemnified thereunder, the Company, on the one hand, and Maxim, on the other hand, shall contribute to the aggregate losses, claims, damages, liabilities and expenses of the nature contemplated by such indemnification provision (including any investigation, legal and other expenses incurred in connection with, and any amount paid in settlement of, any action, suit or proceeding or any claims asserted, but after deducting in the case of losses, claims, damages, liabilities and expenses suffered by the Company, any contribution received by the Company from Persons, other than Maxim, who may also be liable for contribution, including Persons who control the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act, officers of the Company who signed the Registration Statement and directors of the Company) as incurred to which the Company and Maxim may be subject, in such proportions as is appropriate to reflect the relative benefits received by the Company, on the one hand, and Maxim, on the other hand, from the Rights Offering or, if such allocation is not permitted by applicable law, in such proportions as are appropriate to reflect not only the relative benefits referred to above but also the relative fault of the Company, on the one hand, and Maxim, on the other hand, in connection with the statements or omissions which resulted in such losses, claims, damages, liabilities or expenses, as well as any other relevant equitable considerations. The relative benefits received by the Company, on the one hand, and Maxim, on the other hand, shall be deemed to be in the same proportion as: (x) the total proceeds from the Rights Offering (net of the fees of the Dealer-Manager set forth in Section 6 hereof, but before deducting expenses) received by the Company bears to (y) the fees of the Dealer-Manager set forth in Section 6 hereof actually received by the Dealer-Manager. The relative fault of each of the Company, on the one hand, and Maxim, on the other hand, shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the Company or Maxim (which consists solely and exclusively of the Dealer-Manager Information) and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission. The Company and the Dealer-Manager agree that it would not be just and equitable if contribution pursuant to this Section 11(f) were determined by pro rata allocation or by any other method of allocation which does not take account of the equitable considerations referred to above in this Section. The aggregate amount of losses, liabilities,

claims, damages and expenses incurred by an indemnified party and referred to above in this Section 11 shall be deemed to include any legal or other expenses reasonably incurred by such indemnified party in investigating, preparing or defending against any litigation, or any investigation or proceeding by any judicial, regulatory or other legal or governmental agency or body, commenced or threatened, or any claim whatsoever based upon any such untrue or alleged untrue statement or omission or alleged omission. Notwithstanding the provisions of this Section 11: (i) the Dealer-Manager shall not be required to contribute any amount in excess of the fees actually received by the Dealer-Manager from the Company in connection with the Rights Offering and (ii) no Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation. For purposes of this Section 11, each Person controlling the Dealer-Manager within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act shall have the same rights to contribution as such Dealer-Manager, and each Person, if any, who controls the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act, each officer of the Company who shall have signed the Registration Statement and each director of the Company shall have the same rights to contribution as the Company, subject in each case to clauses (i) and (ii) of the immediately preceding sentence. Any party entitled to contribution will, promptly after receipt of notice of commencement of any action, suit or proceeding against such party in respect of which a claim for contribution may be made against another party or parties, notify each party or parties from whom contribution may be sought, but the omission to so notify such party or parties shall not relieve the party or parties from whom contribution may be sought from any obligation it or they may have under this Section 11(f) or otherwise.

12. Effective Date of Agreement; Termination.

(a) This Agreement shall become effective upon the later of the time on which the Dealer-Manager shall have received notification of the effectiveness of the Registration Statement and the time which this Agreement shall have been executed by all of the parties hereto.

(b) At any time during the Rights Offering, this Agreement may be terminated by the Dealer-Manager by giving notice as hereinafter provided to the Company if:

(i) the Company shall have failed, refused or been unable, at any applicable time during the Rights Offering, to perform any material agreement on its part to be performed hereunder,

(ii) any other material condition of the Dealer-Manager's obligations as set forth in Section 10 or elsewhere hereunder is not fulfilled,

(iii) trading in securities generally on the New York Stock Exchange, the Nasdaq Stock Market or the NYSE Alternext U.S. or in the OTCBB, or trading in any securities of the Company on any exchange or in the over-the-counter market, shall have been suspended or minimum prices shall have been established on any such exchanges or such market by the Commission, by such exchange or by any other regulatory body or Governmental Authority,

(iv) a banking moratorium shall have been declared by Federal or state authorities,

(v) there shall have occurred any outbreak or escalation of hostilities or acts of terrorism involving the United States or there is a declaration of a national emergency or war by the United States or there shall have been any other calamity or crisis or any change in political, financial or economic conditions of the United States, or

(vi) there shall have occurred such a material adverse change in general economic, political or financial conditions (or the effect of international conditions on the financial markets in the United States shall be such) as to make it, in the judgment of the Dealer-Manager, inadvisable or impracticable to solicit exercises of the Rights or perform any other of its obligations hereunder.

(c) At any time during the Rights Offering, this Agreement may be terminated by the Company by giving notice as hereinafter provided to the Dealer-Manager if the Company's Board of Directors determines in good faith that the Rights Offering is no longer in the best interests of the Company and its stockholders.

(d) Any termination of this Agreement pursuant to this Section 12 shall be without liability on the part of the Company or the Dealer-Manager, except as otherwise provided in Section 11 hereof. Any notice referred to above may be given at the address specified in Section 14 hereof in writing or by facsimile or telephone, and if by telephone, shall be immediately confirmed in writing.

13. Survival of Certain Provisions. The agreements contained in Section 11 hereof and the representations, warranties and agreements of the Company contained in Sections 5, 6 and 7 hereof shall survive the consummation of or failure to commence the Rights Offering and shall remain in full force and effect, regardless of any termination or cancellation of this Agreement or any investigation made by or on behalf of any indemnified party; *provided* however than in the event of any failure to commence or consummate the Rights Offering, the agreements contained in Section 6 shall terminate and be of no further force or effect.

14. Notices. All notices or other communications hereunder shall be in writing, and (a) if sent to the Dealer-Manager, shall be mailed, delivered, or faxed and confirmed in writing, to Maxim Group LLC, 405 Lexington, New York, New York 10174, Fax Number: (212) 895-3783, Attention: Clifford A. Teller, Executive Managing Director — Investment Banking, in each case, with a copy to Lowenstein Sandler LLP, 1251 Avenue of the Americas, New York, New York, 10020 Fax Number: (973) 597-2477, Attention: Steven M. Skolnick, Esq.; and (b) if sent to the Company shall be mailed, delivered, or faxed and confirmed in writing to the Company and its counsel at the address set forth in the Registration Statement, with a copy to Pepper Hamilton LLP, 301 Carnegie Center, Suite 400, Princeton NJ 08543-5276, Fax Number: (609) 452-1147, Attention: Donald R. Readlinger, Esq. Any such notices and other communications shall take effect at the time of receipt thereof.

15. Parties. This Agreement shall inure to the benefit of and be binding upon the Dealer-Manager, the Company and their respective successors. This Agreement and the terms

32

and provisions hereof are for the sole benefit of only those Persons, except that the representations, warranties, indemnities and agreements of the Company contained in this Agreement shall also be deemed to be for the benefit of the Person or Persons, if any, who control the Dealer-Manager within the meaning of Section 15 of the Act. Nothing in this Agreement shall be construed to give any Person, other than the Persons referred to in this Section, any legal or equitable right, remedy or claim under or in respect of this Agreement or any provision contained herein.

16. Amendment. This Agreement may not be amended or modified except in writing signed by each of the parties hereto.

17. Governing Law; Venue. This Agreement shall be deemed to have been executed and delivered in New York and both this Agreement and the transactions contemplated hereby shall be governed as to validity, interpretation, construction, effect, and in all other respects by the laws of the State of New York, without regard to the conflicts of laws principals thereof (other than Section 5-1401 of The New York General Obligations Law). Each of the Dealer-Manager and the Company: (a) agrees that any legal suit, action or proceeding arising out of or relating to this Agreement and/or the transactions contemplated hereby shall be instituted exclusively in the Supreme Court of the State of New York, New York County, or in the United States District Court for the Southern District of New York; (b) waives any objection which it may have or hereafter to the venue of any such suit, action or proceeding; and (c) irrevocably consents to the jurisdiction of Supreme Court of the State of New York, New York County, or in the United States District Court for the Southern District of New York in any such suit, action or proceeding. Each of the Dealer-Manager and the Company further agrees to accept and acknowledge service of any and all process which may be served in any such suit, action or proceeding in the Supreme Court of the State of New York, New York County, or in the United States District Court for the Southern District of New York and agrees that service of process upon the Company mailed by certified mail to the Company's address or delivered by Federal Express via overnight delivery shall be deemed in every respect effective service of process upon the Company, in any such suit, action or proceeding, and service of process upon the Dealer-Manager mailed by certified mail to the Dealer-Manager's address or delivered by Federal Express via overnight delivery shall be deemed in every respect effective service process upon the Dealer-Manager, in any such suit, action or proceeding. THE COMPANY (ON BEHALF OF ITSELF AND, TO THE FULLEST EXTENT PERMITTED BY LAW, ON BEHALF OF ITS RESPECTIVE EQUITY HOLDERS) HEREBY WAIVES ANY RIGHT THEY MAY HAVE TO A TRIAL BY JURY IN RESPECT OF ANY CLAIM BASED UPON, ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT AND THE TRANSACTIONS CONTEMPLATED BY THIS AGREEMENT, THE REGISTRATION STATEMENT, ANY PRELIMINARY PROSPECTUS AND THE PROSPECTUS.

18. Entire Agreement. This Agreement, together with the exhibit attached hereto and as the same may be amended from time to time in accordance with the terms hereof, contains the entire agreement among the parties hereto relating to the subject matter hereof and there are no other or further agreements outstanding not specifically mentioned herein.

19. Severability. If any term or provision of this Agreement or the performance thereof shall be invalid or unenforceable to any extent, such invalidity or unenforceability shall

33

not affect or render invalid or unenforceable any other provision of this Agreement and this Agreement shall be valid and enforced to the fullest extent permitted by law.

20. Headings. The headings herein are inserted for convenience of reference only and are not intended to be part of, or to affect the meaning or interpretation of, this Agreement.

21. Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, but all such counterparts shall together constitute one and the same instrument. Delivery of a signed counterpart of this Agreement by facsimile or other electronic transmission shall constitute valid and sufficient delivery thereof.

[Signature Page Follows]

34

If the foregoing correctly sets forth your understanding, please so indicate in the space provided below for that purpose, whereupon this letter shall constitute a binding agreement among us.

Very truly yours,

ONCONOVA THERAPEUTICS, INC.

By: _____

Name:

Title:

**Accepted by the Dealer-Manager
as of the date first written above:**

MAXIM GROUP LLC

By: _____

Name:

Title:

[Dealer-Manager Agreement]

Subscription Rights Statement

IMPORTANT: Retain a copy of this statement for your investment, tax and cost-basis records.

[Date]

Account Summary

Subscription Rights

Account # 9999999999

STK2 05 KOFAX
1110 CENTRE POINT CURVE, TEST
MENDOTA HEIGHTS, MN 55120

Year-to-Date Activity								
Transaction or Settlement Date	Transaction Type	Price per Right	Gross Amount	Service Charge	Brokerage Commission	Net Amount	Number of Rights	Balance
BALANCE FORWARD		\$0.0000	\$0.00	\$0.00	\$0.00	\$0.00		0.000
The transaction(s) has been processed as instructed.								

THE TERMS AND CONDITIONS OF THE RIGHTS OFFERING ARE SET FORTH IN THE COMPANY'S PROSPECTUS DATED _____, 2016 (THE "PROSPECTUS") AND ARE INCORPORATED HEREIN BY REFERENCE. COPIES OF THE PROSPECTUS ARE AVAILABLE THROUGH THE SEC'S INTERNET SITE AT [HTTP://WWW.SEC.GOV](http://www.sec.gov) AND AS SET FORTH IN THE "INSTRUCTIONS AS TO USE OF ONCONOVA THERAPEUTICS, INC. RIGHTS STATEMENT" ACCOMPANYING THIS RIGHTS STATEMENT.

THE SUBSCRIPTION RIGHTS WILL EXPIRE IF NOT EXERCISED ON OR BEFORE 5:00 P.M., EASTERN TIME, ON JULY 26, 2016, SUBJECT TO EXTENSION OR EARLIER TERMINATION

THIS CERTIFIES THAT the registered owner whose name is inscribed hereon and is the owner of the number of subscription rights ("Subscription Rights") set forth above. Each Subscription Right entitles the holder thereof to subscribe for and purchase (the "Basic Subscription Right") one Unit of Onconova Therapeutics, a Delaware corporation, at a subscription price of \$ _____ per Unit (the "Subscription Price"), pursuant to a rights offering (the "Rights Offering"), on the terms and subject to the conditions set forth in the Prospectus and the "Instructions as to Use of Onconova Therapeutics, Inc. Subscription Rights Statement" accompanying this Rights Statement. Each Unit consists of one share of common stock, par value of \$0.01 ("Common Stock"), and 0.75 of a warrant ("Warrant") representing the right to purchase one share of Common Stock. Holders who fully exercise their Basic Subscription Rights are entitled to subscribe for additional Units that remain unsubscribed for as a result of any unexercised Basic Subscription Rights pursuant to the terms and conditions of the Rights Offering, subject to proration, as described in the Prospectus (the "Over-subscription Privilege"). The Subscription Rights represented by this Rights Statement may be exercised by completing the appropriate forms on the reverse side hereof and by returning the full payment of the subscription price for each Unit. If the subscriber attempts to exercise its Over-subscription Privilege and the Company is unable to issue the subscriber the full amount of Units requested, the Subscription Agent will return to the subscriber any excess funds submitted as soon as practicable, without interest or deduction. The Subscription Rights may be exercised by duly completing Section 1 on the reverse side hereof and by returning the full payment of the exercise price. THE RIGHTS EVIDENCED BY THIS RIGHTS STATEMENT MAY NOT BE EXERCISED UNLESS THE REVERSE SIDE HEREOF IS PROPERLY COMPLETED AND DULY SIGNED, WITH A SIGNATURE MEDALLION GUARANTEE, IF APPLICABLE.

By completing and delivering this rights statement, the registered owner represents and warrants that they have the right, power and authority, and have taken all action necessary, to exercise these

rights pursuant to the rights offering and to execute, deliver and exercise the Subscription Rights, and that they are not a person otherwise prevented by legal or regulatory restrictions from exercising or acting on behalf of any such person on a non-discretionary basis.

- o Please change my address as indicated.
All registered holders MUST sign in Section 2 on reverse of statement.

STK2 05 KOFAX
1110 CENTRE POINT CURVE, TEST
MENDOTA HEIGHTS, MN 55120

SECTION 1. EXERCISE OF RIGHTS TO PURCHASE

The registered holder of this Subscription Rights Certificate is entitled to exercise the number of Subscription Rights shown in the upper right hand corner of the Rights Statement and may subscribe for additional Units upon the terms and conditions specified in the Prospectus. The undersigned hereby notifies the Subscription Agent of its irrevocable election to subscribe for Units in the following amounts. To subscribe for Units pursuant to your Basic Subscription Right, please complete lines (a) and (c) below. To subscribe for additional Units pursuant to your Over-subscription Privilege, please also complete line (b).

(a) EXERCISE OF BASIC SUBSCRIPTION RIGHT:

Basic Subscription Right: _____ X _____ \$[_____] = \$ _____
Number of Units Subscription price Payment enclosed

(b) EXERCISE OF OVER-SUBSCRIPTION PRIVILEGE: If you have exercised your Basic Subscription Right in full, you may subscribe for additional Units pursuant to your Over-subscription Privilege

Over-Subscription Privilege: _____ X _____ \$[_____] = \$ _____
Number of Units Subscription price Payment enclosed

(c) OWNERSHIP LIMITATION; PRE-FUNDED WARRANTS: If you do not want your subscription for Units to result in beneficial ownership of common stock above 4.99 percent of the common stock outstanding after the Rights Offering and wish to receive Pre-Funded Warrants in lieu of any common stock in excess of those thresholds, please complete the following and contact the dealer-manager in accordance with the "Instructions as to Use of Onconova Therapeutics, Inc. Subscription Rights Statement."

o I wish to receive Pre-Funded Warrants in lieu of any common stock in excess of 4.99% of the common stock outstanding after the Rights Offering.

Method of Payment:

A cashier's check, drawn on a U.S. bank payable to "Wells Fargo Shareowner Services".

Wire transfer of immediately available funds directly to the account maintained by Wells Fargo Shareowner Services, as Subscription Agent for purposes of accepting subscriptions in this Rights Offering at Wells Fargo Bank NA ,ABA 121000248,Credit: Stock Transfer Clearing Account 000-10-67-899, For further credit to Onconova Therapeutics, Inc., and name of Subscription Rights holder.

FULL PAYMENT MUST ACCOMPANY THIS FORM AND MUST BE MADE IN UNITED STATES DOLLARS BY A CASHIER'S CHECK DRAWN A U.S. BANK PAYABLE TO THE RIGHTS AGENT OR A WIRE TRANSFER MUST BE RECEIVED IN ACCORDANCE WITH THE ENCLOSED INSTRUCTIONS. PERSONAL CHECKS WILL NOT BE ACCEPTED.

SECTION 2. SIGNATURE(S)

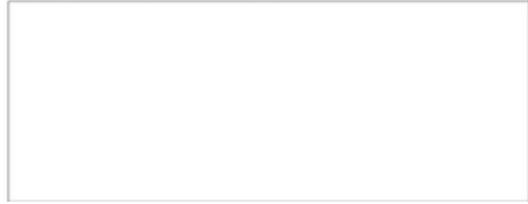
IMPORTANT: THE SIGNATURE(S) MUST CORRESPOND IN EVERY PARTICULAR, WITHOUT ALTERATION, WITH THE NAME(S) AS PRINTED ON THE FRONT OF THIS RIGHTS STATEMENT. IF YOU ARE SIGNING ON BEHALF OF A REGISTERED SHAREHOLDER OR ENTITY YOU MUST SIGN IN YOUR LEGAL CAPACITY WITH YOUR SIGNATURE MEDALLION GUARANTEED. YOUR GUARANTOR (BANK/BROKER) WILL REQUIRE PROOF OF YOUR AUTHORITY TO ACT. CONSULT YOUR GUARANTOR FOR THEIR SPECIFIC REQUIREMENTS. YOU OR YOUR GUARANTOR MAY ACCESS THE SECURITIES TRANSFER ASSOCIATION (STA) RECOMMENDED REQUIREMENTS ON-LINE AT www.stai.org.

Signature(s) of Subscriber(s)

Name(s): _____

Capacity (Full Title): _____

APPLY MEDALLION GUARANTEE STAMP HERE



OVERNIGHT DELIVERY TO THE STREET ADDRESS BELOW BEST ENSURES RECEIPT BY THE EXPIRATION DATE.

Return this statement to

By Mail or Courier or Hand-Delivery to:
Wells Fargo Bank, N.A.
Voluntary Corporate Actions Department
1110 Centre Pointe Curve, Suite 101
Mendota Heights, MN 55120-4100

QuickLinks

[Exhibit 4.5](#)

[Subscription Rights Statement](#)

[SECTION 1. EXERCISE OF RIGHTS TO PURCHASE](#)

[SECTION 2. SIGNATURE\(S\)](#)



301 Carnegie Center
Suite 400
Princeton, NJ 08543-5276
Phone: 609.452.0808
Fax 609.452.1147

June 29, 2016

Onconova Therapeutics, Inc.
375 Pheasant Run
Newton, PA 18940

Re: Rights Offering

Gentlemen:

We have acted as counsel to Onconova Therapeutics, Inc., a Delaware corporation (the "Company"), in connection with the preparation of the Registration Statement on Form S-1 (File No. 333-211769) filed with the Securities and Exchange Commission (the "Commission") on June 1, 2016, as amended by Pre-Effective Amendments No. 1 and 2, filed with the Commission on June 20, 2016 and June 29, 2016, respectively (the "Registration Statement"), by Onconova Therapeutics, Inc., a Delaware corporation (the "Company"), pursuant to the requirements of the Securities Act of 1933, as amended (the "Securities Act"). The Registration Statement relates to the Company's registration of: (i) 4,255,581 non-transferable subscription rights ("Rights") to be distributed by the Company without consideration in connection with a rights offering (the "Rights Offering") to holders of shares of the Company's class of common stock, par value \$0.01 per share ("Common Stock") and to holders of certain of outstanding warrants who are entitled to participate in the Rights Offering; (ii) up to 4,255,581 units ("Units") issuable upon exercise of the Rights, each unit, consisting of one share of Common Stock and 0.75 of a warrant representing the right to purchase one share of Common Stock ("Warrants"); (iii) up to 4,255,581 shares of Common Stock underlying the Units and, if applicable, issuable upon exercise of the Pre-Funded Warrants; (iv) up to 3,191,686 Warrants underlying the Units; up to 3,191,686 shares of Common Stock issuable upon exercise of the Warrants; and (v) up to 4,255,581 pre-funded warrants ("Pre-Funded Warrants") which may be issued to certain investors in lieu Common Stock underlying the Units, to purchase the same number of shares of Common Stock.

In our capacity as counsel, you have requested that we render the opinion set forth in this letter and we are furnishing this opinion letter pursuant to Item 601(b)(5) of Regulation S-K, promulgated by the Commission. We are familiar with the proceedings taken by the board of directors of the Company (the "Board") and the designated pricing committee of the Board (the "Pricing Committee") in connection with the Rights Offering. We have examined all such documents as we considered necessary to enable us to render this opinion, including but not limited to: the Registration Statement, including the exhibits thereto; certain resolutions of the

	Boston		Washington, D.C.		Los Angeles		New York		Pittsburgh
	Detroit		Berwyn		Harrisburg		Orange County		Princeton
									Wilmington

www.pepperlaw.com

Board and Pricing Committee; corporate records and instruments; and such laws and regulations as we have deemed necessary for purposes of rendering the opinions set forth herein. As to any facts material to the opinions expressed herein, which were not independently established or verified, we have relied upon statements and representations of officers and other representatives of the Company and others.

In rendering the opinions set forth below, we have assumed that (i) all information contained in all documents reviewed by us is true and correct; (ii) all signatures on all documents examined by us are genuine; (iii) all documents submitted to us as originals are authentic and all documents submitted to us as copies conform to the originals of those documents; (iv) each natural person signing any document reviewed by us had the legal capacity to do so; (v) any certificates representing securities to be issued pursuant to the Rights Offering, as applicable, will be duly executed and delivered; (vi) the Company will have reserved, from its authorized but unissued and unreserved shares of Common Stock, a number sufficient to issue all Common Stock issuable pursuant to the Rights Offering (including Common Stock issuable upon the exercise of any Warrants or Pre-Funded Warrants) and the issuance of such Common Stock will not exceed the number of then-authorized shares of Common Stock of the Company.

We express no opinion herein as to the law of any state or jurisdiction other than the laws of the State of Delaware and the State of New York, and the federal laws of the United States of America.

Based upon the foregoing, we are of the opinion that:

(1) The Rights have been duly authorized and, when duly distributed by the Company in the manner described in the Registration Statement and in accordance with the resolutions adopted by the Board and Pricing Committee, will constitute valid and legally binding obligations of the Company, enforceable against the Company in accordance with their terms, except as enforcement may be limited by applicable bankruptcy, insolvency, reorganization, arrangement, moratorium, fraudulent transfer and similar laws affecting or relating to the rights of creditors generally, by general principles of equity (regardless of whether considered in a proceeding in equity or at law), and by requirements of materiality, reasonableness, good faith and fair dealing.

(2) The Units have been duly authorized and, if issued upon exercise of the Rights in accordance with the terms of the Rights, will be validly issued, fully paid and nonassessable.

(3) The shares of Common Stock underlying the Units have been duly authorized and, if issued upon exercise of the Rights in accordance with the terms of the Rights, will be validly issued, fully paid and nonassessable.

2

(4) The Warrants and Pre-Funded Warrants have been duly authorized and, if issued upon exercise of the Rights in accordance with the terms of the Rights, and when duly executed and delivered by the Company in the manner described in the Registration Statement and in accordance with the resolutions adopted by the Board and Pricing Committee, will constitute valid and legally binding obligations of the Company under the laws of the State of New York, enforceable against the Company in accordance with their terms, except as enforcement may be limited by applicable bankruptcy, insolvency, reorganization, arrangement, moratorium, fraudulent transfer and similar laws affecting or relating to the rights of creditors generally, by general principles of equity (regardless of whether considered in a proceeding in equity or at law), and by requirements of materiality, reasonableness, good faith and fair dealing.

(5) The Common Stock of the Company issuable upon the exercise of any Warrants or Pre-Funded Warrants has been duly authorized and, if issued upon exercise of the Warrants or Pre-Funded Warrants against payment therefor in accordance with the terms of the Warrants or Pre-Funded Warrants, as applicable, would be validly issued, fully paid and nonassessable.

We assume no obligation to supplement this opinion if any applicable law changes after the date hereof or if we become aware of any fact that might change the opinion expressed herein after the date hereof.

We hereby consent to the filing of this opinion as a part of the Registration Statement and to the reference of our firm under the caption "Legal Matters" in the Registration Statement. In giving such consent, we do not hereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission. This opinion is given to you solely for use in connection with the Registration Statement while the Registration Statement is in effect and is not to be relied upon for any other purpose. Our opinion is expressly limited to the matters set forth above, and we render no opinion, whether by implication or otherwise, as to any other matters relating to the Company or the Registration Statement.

Very truly yours,

/s/ Pepper Hamilton LLP
Pepper Hamilton LLP

3

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the reference to our firm under the caption "Experts" in Pre-Effective Amendment No. 2 to the Registration Statement (Form S-1 No. 333-211769) and related Prospectus of Onconova Therapeutics, Inc. and to the incorporation by reference therein of our report dated March 28, 2016, with respect to the consolidated financial statements of Onconova Therapeutics, Inc. included in its Annual Report (Form 10-K) for the year ended December 31, 2015, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Philadelphia, Pennsylvania
June 29, 2016

QuickLinks

[Exhibit 23.1](#)

[CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM](#)

**FORM OF
INSTRUCTIONS AS TO USE OF ONCONOVA THERAPEUTICS, INC.
SUBSCRIPTION RIGHTS STATEMENTS**

Please consult Maxim Group LLC, the Dealer-Manager for the Rights Offering,
or your bank or broker as to any questions.

The following instructions relate to a rights offering (the "Rights Offering") by Onconova Therapeutics, Inc., a Delaware corporation ("Onconova"), to the holders of record of its common stock, \$0.01 par value (the "Common Stock") participating warrant holders, as described in Onconova's prospectus dated _____, 2016 (the "Prospectus"). Each holder of record of Common Stock and each participating warrant holder at the close of business on July 7, 2016 (the "Record Date") will receive, at no charge, 1.5 non-transferable subscription rights (the "Subscription Rights") for each share of Common Stock held or underlying the participating warrants held at the Record Date.

Subscription Rights exercisable into an aggregate of 4,255,581 Units of Onconova ("Units") are being distributed in connection with the Rights Offering. Each Unit is comprised of one share of Common Stock and 0.75 of a warrant to purchase an additional share of Common Stock. Each whole Subscription Right is exercisable, upon payment of \$ _____ in cash (the "Subscription Price"), to purchase one Unit (the "Basic Subscription Right"). In addition, each Subscription Right also carries the right to subscribe at the Subscription Price for additional Units that are not purchased by other holders pursuant to their Basic Subscription Right (to the extent available, and subject to proration) (the "Over-Subscription Privilege"). A holder is entitled to exercise an Over-Subscription Privilege only if the holder fully exercises the Basic Subscription Right. See "The Rights Offering" in the Prospectus.

No fractional Subscription Rights or cash in lieu thereof will be issued or paid. Fractional Subscription Rights will be rounded down to the nearest whole number.

The Subscription Rights will expire at 5:00 PM Eastern Time, on July 26, 2016, unless extended ("the "Expiration Date"). If you do not exercise your Subscription Rights before that time, your Subscription Rights will expire and will no longer be exercisable. Onconova will not be required to issue shares to you if the Subscription Agent receives your Subscription Rights Statement or your subscription payment after that time. Onconova has the option to extend the Rights Offering in its sole discretion, although it does not presently intend to do so. Onconova may extend the Rights Offering by giving oral or written notice to the Subscription Agent before the Expiration Date. If Onconova elects to extend the Rights Offering, Onconova will issue a press release announcing the extension no later than 9:00 AM Eastern Time, on the next business day after the most recently announced Expiration Date of the Rights Offering.

The number of Subscription Rights to which you are entitled is printed on the face of your Subscription Rights Statement. You should indicate your wishes with regard to the exercise of your Subscription Rights by completing the appropriate section on the back of your Subscription Rights Statement and returning the Subscription Rights Statement with your payment to the Subscription Agent in the envelope provided.

Warrants that are issued as a component of the Unit pursuant to the exercise of the Basic Subscription Rights and Over-Subscription Privilege entitle the holder to purchase one share of Common Stock at an exercise price (subject to adjustment) of \$ _____ per share, 120% of the per Unit price, from the date of issuance through their expiration date. The Warrants are exercisable for cash, or solely during any period when a registration statement for the exercise of the Warrants is not in effect, on a cashless basis. The Warrants may be redeemed for \$0.001 per Warrant if the volume weighted average price of Onconova's Common Stock is above \$ _____ per share, 300% of the exercise price, for each of 10 consecutive trading days. See "The Rights Offering" in the Prospectus.

YOUR SUBSCRIPTION RIGHTS STATEMENT MUST BE RECEIVED BY THE SUBSCRIPTION AGENT ON OR BEFORE THE EXPIRATION DATE AND TIME. PAYMENT OF THE

SUBSCRIPTION PRICE OF ALL SUBSCRIPTION RIGHTS EXERCISED, INCLUDING SUBSCRIPTION RIGHTS PURSUANT TO THE OVER-SUBSCRIPTION PRIVILEGE, MUST BE RECEIVED BY THE SUBSCRIPTION AGENT ON OR BEFORE THE EXPIRATION DATE AND TIME. ONCE YOU EXERCISE YOUR SUBSCRIPTION RIGHTS, YOU CANNOT REVOKE THE EXERCISE OF SUCH SUBSCRIPTION RIGHTS. SUBSCRIPTION RIGHTS NOT VALIDLY EXERCISED PRIOR TO THE EXPIRATION DATE OF THE RIGHTS OFFERING WILL EXPIRE. IN CASE YOU HOLD SUBSCRIPTION RIGHTS THROUGH A BROKER OR OTHER NOMINEE, YOU SHOULD VERIFY WITH YOUR BROKER OR NOMINEE BY WHEN YOU MUST DELIVER YOUR INSTRUCTION.

1. **Subscription Rights.** To exercise Subscription Rights, complete your Subscription Rights Statement and send your properly completed and executed Subscription Rights Statement, together with payment in full of the Subscription Price for each Unit subscribed for pursuant to the Basic Subscription Right and the Over-Subscription Privilege, to the Subscription Agent. **PLEASE DO NOT SEND SUBSCRIPTION RIGHTS STATEMENTS OR PAYMENTS TO ONCONOVA.** The method of delivery of the Subscription Rights Statement and the payment of the Subscription Price to the Subscription Agent is at your election and risk. Subscription Rights Statements and payments must be received by the Subscription Agent prior to the Expiration Date and Time. If you send your Subscription Rights Statement and payment by mail, then they should be sent by registered mail, to arrive before the Expiration Date. If more Units are subscribed for pursuant to the Over-Subscription Privilege than are available for sale, additional Units will be allocated pro rata among holders, as described in the Prospectus. The Subscription Rights are non-transferable, and may not be sold, transferred, assigned or given away to anyone.

2. **Acceptance of Payments.** Payments will be deemed to have been received by the Subscription Agent only upon the (i) receipt of a cashier's check drawn against a U.S. bank payable to "Wells Fargo Bank, N.A., as Subscription Agent for Onconova Therapeutics, Inc.," (ii) receipt of a wire transfer of immediately available funds directly to the account maintained by Wells Fargo Bank, N.A., as Subscription Agent for purposes of accepting subscriptions in this Rights Offering at Wells Fargo Bank, N.A., ABA 121000248, Credit: Stock Transfer Clearing Account 000-10-67-899, For further credit to Onconova Therapeutics, Inc., and name of Subscription Rights holder.

3. **Contacting the Subscription Agent or Dealer-Manager.** The address of the Subscription Agent is shown below. Delivery to an address other than shown below does not constitute valid delivery.

By Mail:

**Wells Fargo Bank, N.A.
Shareowner Services
Voluntary Corporate Actions
P.O. Box 64858
St. Paul, Minnesota 55164-0858**

By Hand or Overnight Courier:

**Wells Fargo Bank, N.A.
Shareowner Services
Voluntary Corporate Actions
1110 Centre Pointe Curve, Suite 101
Mendota Heights, Minnesota 55120**

If you have other questions or need assistance, please contact the dealer-manager for the Rights Offering:

Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745

4. **Partial Exercises; Effect of Over- and Under-Payments.** If you exercise less than all of the Subscription Rights evidenced by your Subscription Rights Statement, and make the choice to submit an additional exercise request you must contact the dealer-manager for a new Subscription Rights Statement. If you choose to have a new Subscription Rights Statement sent to you, you may not receive any such new Subscription Rights Statement in sufficient time to permit exercise of the Subscription Rights evidenced thereby. If you do not indicate the number of Units to be subscribed for on your Subscription Rights Statement, or if you indicate a number of Units that does not correspond with the aggregate Subscription Price payment you delivered, you will be deemed to have subscribed for the maximum number of Units that may be subscribed for, under both the Basic Subscription Right and the Over-Subscription Privilege, for the aggregate Subscription Price you delivered. If the Subscription Agent does not apply your full Subscription Price payment to your purchase of Units, then the Subscription Agent will return the excess amount to you, without interest or deduction, as soon as practicable after the Expiration Date. If you subscribe for fewer than all of the Units represented by your Subscription Rights Statement, then the unexercised Subscription Rights will become null and void on the Expiration Date.

5. **Pre-Funded Warrants.** If your subscription for Units in the Rights Offering may result in the your beneficial ownership of more than 4.99% of our outstanding common stock following the consummation of the Rights Offering, and you do not wish to exceed that ownership threshold, you may elect to receive a Pre-Funded Warrant to purchase one share of common stock in lieu of any share of common stock underlying the Units for which you have subscribed in excess of such threshold. Each Pre-Funded Warrant will have an exercise price of \$0.01, and the subscription price per Unit for any such electing investors will be reduced to \$ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant).

You may make an election to receive Pre-Funded Warrants in lieu of common stock, to the extent that your beneficial ownership would otherwise be above the ownership threshold. If you intend to do so, in addition to making your election on your Subscription Rights Statement, we ask that you contact the dealer-manager for the Rights Offering as follows:

Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745

6. **Deliveries to Holders.** The following deliveries and payments to you will be made to the address shown on the face of your Subscription Rights Statement:

(a) **Basic Subscription Right.** The shares of Common Stock and Warrants that are purchased pursuant to the valid exercise of Basic Subscription Rights to purchase Units will be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration (DRS) account statement from our transfer agent reflecting ownership of these securities if you are a holder of record of Common Stock or participating warrants. The Subscription Agent will arrange for the issuance of the Common Stock and Warrants as soon as practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all

prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected. If you hold your shares of Common Stock in the name of a custodian bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the securities you purchased in the Rights.

(b) **Over-Subscription Privilege.** The shares of Common Stock and Warrants that are purchased pursuant to the valid exercise of Over-Subscription Privileges to purchase additional Units will also be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration (DRS) account statement from our transfer agent reflecting ownership of these securities if you are a holder of record of Common Stock or participating warrants. The Subscription Agent will arrange for the issuance of the Common Stock and Warrants as soon as practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected. If you hold your shares of Common Stock in the name of a custodian bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the securities you purchased in the Rights.

(c) **Pre-Funded Warrants.** If you elect to receive any Pre-Funded Warrants, the Subscription Agent will arrange for the issuance of the Pre-Funded Warrants as soon as practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected. All Pre-Funded Warrants will be issued in physical form.

(d) **Excess Payments.** If you exercised your Over-Subscription Privilege and are allocated less than all of the Units for which you wished to oversubscribe, then your excess Subscription Price payment for Units that were not allocated to you will be returned by the Subscription Agent to you, without interest or deduction, as soon as practicable after the Expiration Date.

7. Execution.

(a) **Execution by Registered Holder.** The signature on the Subscription Rights Statement must correspond with the name of the registered holder exactly as it appears on the face of the Subscription Rights Statement without any alteration or change whatsoever. Persons who sign the Subscription Rights Statement in a representative or other fiduciary capacity must indicate their capacity when signing.

(b) **Execution by Person Other Than Registered Holder.** If the Subscription Rights Statement is executed by a person other than the holder named on the face of the Subscription Rights Statement, YOU MUST SIGN IN YOUR LEGAL CAPACITY WITH YOUR SIGNATURE MEDALLION GUARANTEED. YOUR GUARANTOR (BANK/BROKER) WILL REQUIRE PROOF OF YOUR AUTHORITY TO ACT. CONSULT YOUR GUARANTOR FOR THEIR SPECIFIC REQUIREMENTS. YOU OR YOUR GUARANTOR MAY ACCESS THE SECURITIES TRANSFER ASSOCIATION (STA) RECOMMENDED REQUIREMENTS ON-LINE AT www.stai.org.

8. **Method of Delivery.** The method of delivery of Subscription Rights Statements and payment of the Subscription Price to the Subscription Agent will be at the election and risk of the Subscription Rights holder. If sent by mail, it is recommended that they be sent by registered mail, with return receipt requested, and that a sufficient number of days be allowed to ensure delivery to and receipt by the Subscription Agent prior to the Expiration Date.

9. **No Revocation.** If you exercise any of your Basic Subscription Rights or Over-Subscription Privilege, you will not be permitted to revoke or change the exercise or request a refund of monies paid. You should not exercise your Subscription Rights unless you are sure that you wish to purchase Units at the Subscription Price. Once you exercise your Subscription Rights, you cannot revoke the exercise of such Subscription Rights even if you later learn information that you consider to be unfavorable and even if the market price of our Common Stock is below the Subscription Price.

10. **Special Provisions Relating to the Exercise of Subscription Rights through the Depository Trust Company.** In the case of Subscription Rights that are held of record through The Depository Trust Company ("DTC"), exercises of the Subscription Rights may be effected by instructing DTC to transfer Subscription Rights from the DTC account of such holder to the DTC account of the Subscription Agent, together with certification as to the aggregate number of Subscription Rights exercised pursuant to the Subscription Right by each beneficial owner of Subscription Rights on whose behalf such nominee is acting, and payment of the Subscription Price for each Unit subscribed for. Banks, brokers and other nominee holders of Subscription Rights who exercise the Basic Subscription Right and the Over-Subscription Privilege on behalf of beneficial owners of Subscription Rights will be required to certify to the Subscription Agent and Onconova as to the aggregate number of Subscription Rights that have been exercised, and the number of Units that are being subscribed for pursuant to the Over-Subscription Privilege, by each beneficial owner of Subscription Rights (including such nominee itself) on whose behalf such nominee holder is acting. In the event such certification is not delivered in respect of a Subscription Rights Statement, the Subscription Agent shall for all purposes (including for purposes of any allocation in connection with the Over-Subscription Privilege) be entitled to assume that such Statement is exercised on behalf of a single beneficial owner. If you wish to make an election to receive Pre-Funded Warrants, your bank, broker or other nominee will require additional information from you, including instructions for any issuance of Pre-Funded Warrants, which will be issued in physical form.

11. **Questions and Request for Additional Materials.** For questions regarding the Rights Offering, assistance regarding the method of exercising Subscription Rights or for additional copies of relevant documents, please contact the dealer-manager for the Rights Offering as follows:

Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745

QuickLinks

[Exhibit 99.1](#)

[FORM OF INSTRUCTIONS AS TO USE OF ONCONOVA THERAPEUTICS, INC. SUBSCRIPTION RIGHTS STATEMENTS](#)
[Please consult Maxim Group LLC, the Dealer-Manager for the Rights Offering, or your bank or broker as to any questions.](#)

**FORM OF
LETTER TO SHAREHOLDERS WHO ARE RECORD HOLDERS
ONCONOVA THERAPEUTICS, INC.**

Subscription Rights to Purchase Units
Offered Pursuant to Subscription Rights Distributed to Shareholders of Onconova Therapeutics, Inc.

, 2016

Dear Shareholder:

This letter is being distributed by Onconova Therapeutics, Inc. (the "Company") to all holders of record of shares of its common stock, \$0.01 par value per share (the "Common Stock"), and warrant holders who have a right to participate, as of 5:00 PM Eastern Time, on July 7, 2016 (the "Record Date"), in connection with a distribution in a rights offering (the "Rights Offering") of non-transferable subscription rights (the "Subscription Rights") to subscribe for and purchase units ("Units"). Each Unit entitles the holder to one share of the Company's Common Stock and 0.75 of a warrant representing the right to purchase one share of Common Stock. The Subscription Rights and Units are described in the prospectus dated _____, 2016 (a copy of which accompanies this notice) (the "Prospectus").

Pursuant to the Rights Offering, the Company is issuing Subscription Rights to subscribe for up to 4,255,581 Units on the terms and subject to the conditions described in the Prospectus, at a subscription price of \$ _____ per Unit (the "Subscription Price").

The Subscription Rights may be exercised at any time during the subscription period, which commences on July 8, 2016 and ends at 5:00 PM Eastern Time, on July 26, 2016, unless extended by the Company in its sole discretion (as it may be extended, the "Expiration Date").

As described in the Prospectus, holders will receive one Subscription Right for each share of Common Stock owned, or underlying the participating warrants owned, as the case may be, on the Record Date, evidenced by non-transferable Subscription Rights statements (the "Subscription Rights Statements"). Each Subscription Right entitles the holder to purchase one Unit at the Subscription Price (the "Basic Subscription Right").

Holders who fully exercise their Basic Subscription Right will be entitled to subscribe for additional Units that remain unsubscribed as a result of any unexercised Basic Subscription Right (the "Over-Subscription Privilege"). If sufficient Units are available, all Over-Subscription Privilege requests will be honored in full. If Over-Subscription Privilege requests for Units exceed the remaining Units available, the remaining Units will be allocated pro-rata among holders who over-subscribe based on the number of shares of Common Stock owned, or underlying the participating warrants owned, as the case may be, on the Record Date by all holders exercising the Over-Subscription Privilege. If this pro rata allocation results in any holder receiving a greater number of Units than the holder subscribed for, then such holder will be allocated only the number of Units for which the holder oversubscribed, and the remaining Units will be allocated among all holders exercising the Over-Subscription Privilege on the same pro rata basis described above. The proration process will be repeated until all Units have been allocated.

The Company will not issue fractional shares. Fractional shares resulting from the exercise of the Basic Subscription Rights and the Over-Subscription Privileges will be eliminated by rounding down to the nearest whole Unit. Any excess subscription payment received by the Subscription Agent will be returned, without interest or penalty, as soon as practicable following the expiration of the Offering.

Enclosed are copies of the following documents:

1. Prospectus
 2. Subscription Rights Statement
-

3. Instructions As to Use of Subscription Rights Statements
4. A return envelope, addressed to Wells Fargo Bank N.A. (the "Subscription Agent")

Your prompt attention is requested. To exercise your Subscription Rights, you should deliver the properly completed and signed Subscription Rights Statement, with payment of the Subscription Price in full for each Unit subscribed for pursuant to the Basic Subscription Right and Over-Subscription Privilege, if applicable, to the Subscription Agent, as indicated in the Prospectus. The Subscription Agent must receive the properly completed and duly executed Subscription Rights Statement and full payment of the Subscription Price, including final clearance of any checks, prior to the Expiration Date.

You cannot revoke the exercise of your Subscription Right. Subscription Rights not exercised at or prior to 5:00 PM Eastern Time, on the Expiration Date will expire.

ANY QUESTIONS OR REQUESTS FOR ASSISTANCE CONCERNING THE RIGHTS OFFERING SHOULD BE DIRECTED TO MAXIM GROUP LLC, THE DEALER-MANAGER, AT SYNDICATE@MAXIMGRP.COM OR COLLECT AT (212) 895-3745.

QuickLinks

[Exhibit 99.2](#)

[FORM OF LETTER TO SHAREHOLDERS WHO ARE RECORD HOLDERS ONCONOVA THERAPEUTICS, INC.](#)

[Subscription Rights to Purchase Units Offered Pursuant to Subscription Rights Distributed to Shareholders of Onconova Therapeutics, Inc.](#)

ONCONOVA THERAPEUTICS, INC.

Subscription Rights to Purchase Up to Units
 Consisting of an Aggregate of Up to Shares of Common Stock
 and Warrants to Purchase Up to Shares of Common Stock
 at a Subscription Price of \$ Per Unit

**FOR USE WITH ELECTION TO RECEIVE PRE-FUNDED WARRANTS
 (IF APPLICABLE)**

Subject to the terms and conditions described in the Prospectus dated _____, 2016

The undersigned Beneficial Holder of non-transferable subscription rights (the “**Subscription Rights**”) to purchase units (“**Units**”) of Onconova Therapeutics, Inc., comprised of one share of common stock (“**Common Stock**”) and 0.75 of a warrant to purchase an additional share of Common Stock (a “**Warrant**”) pursuant to the Subscription Rights offering (“**Rights Offering**”) described and provided for in the Company’s Prospectus dated _____, 2016, hereby certifies to Onconova Therapeutics, Inc., Wells Fargo Bank, N.A., as Subscription Agent, and Maxim Group LLC, as Dealer-Manager, that:

- (1) the undersigned Beneficial Holder has exercised the number of Subscription Rights pursuant to the Basic Subscription Right (as defined in the Prospectus) and Over-Subscription Privilege (as defined in the Prospectus) for the number of Units specified below,
- (2) to the extent the undersigned Beneficial Holder has elected to subscribe for Units pursuant to the Over-Subscription Privilege, the Beneficial Holder’s Basic Subscription Right has been exercised in full; and
- (3) the undersigned Beneficial Holder has elected to receive Pre-Funded Warrants (as defined in the Prospectus) in lieu of any shares of Common Stock underlying the Units for which the Beneficial Holder has subscribed in excess of 4.99% of the Common Stock outstanding after the Rights Offering.

Number of Subscription Rights Exercised	Units Subscribed for pursuant to Basic Subscription Right	Units Subscribed for pursuant to Over-Subscription Privilege	Total Shares Beneficially Owned prior to Rights Offering (for purposes of Pre-Funded Warrant Calculations)

Beneficial Holder Information:

Name of Beneficial Holder:
 Signature of Authorized Signatory:
 Name of Authorized Signatory:
 Title of Authorized Signatory:
 Email Address of Authorized Signatory:
 Facsimile Number of Authorized Signatory:
 Address for Delivery of Pre-Funded Warrants to Beneficial Holder:

Beneficial Holder EIN Number:

In order to complete a Pre-Funded Warrant election for a Beneficial Holder, the DTC Participant must subscribe through the DTC’s Reorganization Department “ASOP” System (Automated Subscription Offer Program), submit voluntary offering instructions (VOI) to DTC at the beneficial holder level, and complete this form and submit it to the Dealer-Manager, at syndicate@maximgrp.com. Immediately after submitting this form, the DTC Participant should telephone Maxim Group LLC (212) 895-3745, to confirm receipt and discuss any other steps it may need to take.

DTC Participant Information:

DTC Participant:
 DTC Participate Number:
 DTC VOI Number:

If you have any questions about the Rights Offering, please contact the dealer-manager, Maxim Group LLC, at 405 Lexington Avenue, New York, New York 10174, Attention Syndicate Department, email: syndicate@maximgrp.com or telephone: (212) 895-3745.

Onconova Therapeutics, Inc. will resolve all questions regarding the validity and form of the exercise of Subscription Rights, including time of receipt and eligibility to participate in the Rights Offering. The number of Pre-Funded Warrants to be issued to the Beneficial Holder, if any, will be determined by Onconova Therapeutics, Inc. based on the Total Shares Beneficially Owned prior to Rights Offering set forth above, after the expiration of the Rights Offering and the final allocation of Units through the Over-Subscription Privilege proration process described in the Prospectus. The determinations of Onconova Therapeutics, Inc. will be final and binding. Onconova Therapeutics, Inc. reserves the absolute right to reject any subscriptions not properly submitted or the acceptance of which would be unlawful. Irregularities in connection with any subscriptions must be resolved before the expiration date of the Rights Offering, unless waived by Onconova Therapeutics, Inc. in its sole discretion. Neither Onconova Therapeutics, Inc. nor the Subscription Agent is under any duty to give notification of defects in any subscriptions, nor shall any of them incur any liability for failure to give such notification. A subscription will be considered accepted, subject to the right of Onconova Therapeutics, Inc. to withdraw or terminate the Rights Offering, only when the Subscription Agent receives a properly completed and duly executed Subscription Rights Statement and any other required documents and the full subscription payment. The interpretations of Onconova Therapeutics, Inc. regarding the terms and conditions of the Rights Offering will be final and binding.

NONE OF THE COMPANY, ITS MANAGEMENT OR BOARD OF DIRECTORS, THE SUBSCRIPTION AGENT OR THE DEALER MANAGER MAKES ANY RECOMMENDATION TO ANY HOLDER OF SUBSCRIPTION RIGHTS AS TO WHETHER TO EXERCISE THE SUBSCRIPTION RIGHTS OR REFRAIN FROM EXERCISING THE SUBSCRIPTION RIGHTS IN THE RIGHTS OFFERING. NONE OF THE COMPANY, ITS MANAGEMENT OR BOARD OF DIRECTORS, THE SUBSCRIPTION AGENT OR THE DEALER MANAGER HAS AUTHORIZED ANY PERSON TO GIVE ANY INFORMATION OR TO MAKE ANY REPRESENTATION IN CONNECTION WITH THE RIGHTS OFFERING OTHER THAN THE INFORMATION AND REPRESENTATIONS CONTAINED IN THE PROSPECTUS. IF ANYONE MAKES ANY RECOMMENDATION OR REPRESENTATION OR GIVES ANY SUCH INFORMATION, YOU SHOULD NOT RELY UPON THAT RECOMMENDATION, REPRESENTATION OR INFORMATION AS HAVING BEEN AUTHORIZED BY THE COMPANY, ITS MANAGEMENT OR BOARD OF DIRECTORS, THE SUBSCRIPTION AGENT OR THE DEALER MANAGER.
