

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**

Washington, DC 20549

**FORM 8-K**

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

Date of Report (Date of earliest event reported): **April 27, 2018**

**Onconova Therapeutics, Inc.**

(Exact name of Registrant as specified in its charter)

**Delaware**  
(State or Other Jurisdiction  
of Incorporation or Organization)

**001-36020**  
(Commission  
File Number)

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

**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)

**Not Applicable**

(Former name or former address, if changed since last report)

Check the appropriate box below if the Form 8-K is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company

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

**Item 1.01. Entry into a Material Definitive Agreement**

On April 27, 2018, Onconova Therapeutics, Inc. (the "Company") entered into an underwriting agreement (the "Underwriting Agreement") with H.C. Wainwright & Co., LLC ("HCW"), relating to the public offering (the "Offering") of 46,588,234 shares of the Company's common stock, par value \$0.01 per share (the "Common Stock"), pre-funded warrants ("Pre-Funded Warrants") to purchase an aggregate of 12,235,295 shares of Common Stock and preferred stock warrants ("Preferred Stock Warrants") to purchase up to an aggregate of 1,470,588.225 shares of the Company's Series B Convertible Preferred Stock, par value \$0.01 per share (the "Series B Preferred Stock"). Each share of Common Stock or Pre-Funded Warrant, as applicable, was sold together with a Preferred Stock Warrant to purchase a 0.025 share of Series B Preferred Stock at a combined public offering price of \$0.425 per share of

Common Stock or \$0.415 per Pre-Funded Warrant, as applicable, and accompanying Preferred Stock Warrant. The Offering is expected to close on or about May 1, 2018.

The Company expects the net proceeds from the Offering will be approximately \$22.2 million after deducting underwriting discounts and commissions and other estimated offering expenses payable by the Company. The Company intends to use the net proceeds from the Offering for to fund the development of its clinical and preclinical programs, for other research and development activities and for general corporate purposes, which may include capital expenditures and funding its working capital needs.

The Pre-Funded Warrants are exercisable immediately at an exercise price of \$0.01 per share, may be exercised until they are exercised in full, and may be exercised on a cashless basis in certain circumstances specified therein.

The Preferred Stock Warrants will be exercisable immediately at an exercise price of \$0.425 per 0.025 share of Series B Preferred Stock (convertible into one share of Common Stock) and will expire on the 18-month anniversary of the date (the "Charter Amendment Date") on which the Company publicly announces through the filing of a Current Report on Form 8-K that the Charter Amendment (defined below) has been filed with the Secretary of State of the State of Delaware. The Preferred Stock Warrants may be exercised on a cashless basis in certain circumstances specified therein.

A summary description of the Series B Preferred Stock is set forth below under Item 5.03 of this Current Report on Form 8-K and is incorporated herein by reference.

The exercise price and number of shares of Common Stock or Series B Preferred Stock issuable upon exercise of the Pre-Funded Warrants or Preferred Stock Warrants, as the case may be, and the conversion price and number of shares of Common Stock issuable upon the conversion of Series B Preferred Stock, will be subject to adjustment in the event of any stock split, reverse stock split, stock dividend, recapitalization, reorganization or similar transaction, as described in the Pre-Funded Warrants, Preferred Stock Warrants and the Certificate of Designation of the Series B Preferred Stock, as applicable. The shares of Common Stock or Pre-Funded Warrants, as applicable, and the accompanying Preferred Stock Warrants could only be purchased together in the Offering but will be issued separately.

The Company has granted HCW a 30-day option to purchase up to 8,823,529 additional shares of Common Stock at a purchase price of \$0.415 per share and/or Preferred Stock Warrants to purchase up to an aggregate of 220,588.225 shares of Series B Preferred Stock at a purchase price of \$0.01 per Preferred Stock Warrant, less the underwriting discounts and commissions. On April 27, 2017, HCW fully exercised this option for 8,823,529 additional shares of Common Stock and Preferred Stock Warrants to purchase up to an aggregate of 220,588.225 shares of Series B Preferred Stock. The Company expects the additional net proceeds from the exercise of the option will be approximately \$3.4 million after deducting underwriting discounts and commissions and other estimated offering expenses payable by the Company.

HCW acted as sole book-running manager for the Offering, which was a firm commitment underwritten public offering pursuant to a registration statement on Form S-1 (Registration No. 333-224315) that was declared effective by the Securities and Exchange Commission (the "SEC") on April 26, 2018. The Offering was made only by means of a prospectus forming a part of the effective registration statement. The Company will pay HCW a

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commission equal to 8.0% of the gross proceeds of the Offering, a management fee equal to 1.0% of the gross proceeds of the Offering and other expenses.

The Underwriting Agreement contains customary representations, warranties, and agreements by the Company, and customary conditions to closing, indemnification obligations of the Company and the underwriter, including for liabilities under the Securities Act of 1933, as amended, other obligations of the parties, and termination provisions. Pursuant to the Underwriting Agreement, the Company agreed, subject to certain exceptions, not to offer, issue or sell any shares of Common Stock or securities convertible into or exercisable or exchangeable for shares of Common Stock for a period of one hundred and twenty (120) days following the Offering without the prior written consent of the Underwriter.

#### ***Company Lock-Up Waiver Agreement***

In connection with the Company's underwritten public offering of securities closed on February 12, 2018 (the "February 2018 Offering"), the Company agreed to certain restrictions (the "Company Lock-Up") set forth in Section 5(j) of the Underwriting Agreement dated as of February 8, 2018 (the "February 2018 Underwriting Agreement") between the Company and HCW, as the underwriter for the February 2018 Offering. The Company Lock-Up, among other items, prohibited the Company, during a period of one hundred and thirty-five (135) days from February 8, 2018, without the prior written consent of HCW, from offering or selling any Common Stock or any securities convertible into or exercisable or exchangeable for Common Stock. In order to receive HCW's waiver of the Company Lock-Up, in connection with the Offering, on April 16, 2018, the Company entered into a Lock-Up Waiver Agreement (the "Lock-Up Waiver Agreement") with HCW and certain holders of the Company's preferred stock warrants issued in the February 2018 Offering (the "February 2018 Preferred Stock Warrants"), pursuant to which (i) HCW waived the Company Lock-Up solely with respect to the Offering, and (ii) the Company agreed to reduce the exercise price of the February 2018 Preferred Stock Warrants such that the exercise price of the February 2018 Preferred Stock Warrants shall be equal to 105% of the public offering price of Common Stock sold in the Offering (but only to the extent that such public offering price is lower than the current exercise price of the February 2018 Preferred Stock Warrants) and that such repricing shall be effective concurrently with the closing of the Offering. In accordance with the Lock-Up Waiver Agreements, the exercise price of the February 2018 Preferred Stock Warrants will be repriced from \$1.01 per 0.1 share of Series A Convertible Preferred Stock to \$0.44625 per 0.1 share of Series A Convertible Preferred Stock when the Offering closes on May 1, 2018.

The foregoing descriptions of the Underwriting Agreement, the Certificate of Designation, the Preferred Stock Warrants, the Pre-Funded Warrants and the Lock-Up Waiver Agreement are not complete and are qualified in their entirety by reference to the full text of the Underwriting Agreement, the Certificate of Designation, the forms of the Preferred Stock Warrant and Pre-Funded Warrant and the form of Lock-Up Waiver Agreement, copies of which are filed as Exhibits 1.1, 3.1, 4.1, 4.2 and 10.1, respectively, to this Current Report on Form 8-K and are incorporated by reference herein.

#### **Item 3.03. Material Modifications to Rights of Security Holders**

The information about the Certificate of Designation of Series B Preferred Stock set forth under Item 5.03 of this Current Report on Form 8-K is hereby incorporated by reference into this Item 3.03.

### Item 5.03. Amendments to Articles of Incorporation or Bylaws; Change in Fiscal Year

On April 27, 2018, the Company filed a Certificate of Designation of Preferences, Rights and Limitations of Series B Convertible Preferred Stock (the "Certificate of Designation") with the Delaware Secretary of State. Each 0.025 share of Series B Preferred Stock will be convertible into one share of Common Stock. The Company does not currently have a sufficient number of authorized shares of Common Stock to cover the shares issuable upon the conversion of Series B Preferred Stock. As a result, before any shares of Series B Preferred Stock can be converted, the Company needs to receive stockholder approval of an amendment (the "Charter Amendment") to its Tenth Amended and Restated Certificate of Incorporation, as amended, to sufficiently increase the Company's authorized shares of Common Stock to cover the conversion of all outstanding shares of Series B Preferred Stock into Common Stock. The Company has agreed in the Underwriting Agreement to use reasonable efforts to obtain

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such approval within forty-five (45) days from the date of the prospectus relating to the Offering, and the Company intends to seek such approval at a special meeting of stockholders or its 2018 annual meeting of stockholders. The Series B Preferred Stock is not convertible until the next business day after the Company files the Charter Amendment with the Secretary of State of the State of Delaware. The holder, however, will be prohibited from converting shares Series B Preferred Stock into shares of Common Stock if, as a result of such conversion, the holder, together with its affiliates, would own more than 4.99% of the shares of the Company's shares of common stock then issued and outstanding, which may be increased to 9.99% in certain circumstances. Shares of Series B Preferred Stock will generally have no voting rights, except as required by law and except that the consent of holders of a majority of the outstanding Series B Preferred Stock will be required to (i) alter or change adversely the powers, preferences or rights given to the Series B Preferred Stock or alter or amend the Certificate of Designation, (ii) amend any provision of the Company's certificate of incorporation that would have a materially adverse effect on the rights of the holders of the Series B Preferred Stock, (iii) increase the number of authorized shares of Series B Preferred Stock, or (iv) enter into any agreement with respect to the foregoing. Shares of Series B Preferred Stock will not be entitled to receive any dividends, unless and until specifically declared by the Company's board of directors, and will rank:

- on parity with the Company's common stock on an as-converted basis;
- senior to any class or series of the Company's capital stock created thereafter specifically ranking by its terms junior to the Series B Preferred Stock;
- on parity with the Company's Series A Convertible Preferred Stock and any other class or series of the Company's capital stock created thereafter specifically ranking by its terms on parity with the Series B Preferred Stock; and
- junior to any class or series of the Company's capital stock created thereafter specifically ranking by its terms senior to the Series B Preferred Stock.

A copy of the Certificate of Designation relating to the Series B Preferred Stock is filed as Exhibit 3.1 to this Current Report on Form 8-K. The foregoing summary of the terms of the Certificate of Designation is subject to, and qualified in its entirety by, such document, which is incorporated herein by reference.

### Item 8.01. Other Events

On April 27, 2018, the Company issued a press release announcing the pricing of the Offering. A copy of the press release is attached hereto as Exhibit 99.1 and is incorporated herein by reference.

### Forward-Looking Statements

Some of the statements in Current Report on Form 8-K are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, Section 21E of the Securities Exchange Act of 1934, as amended, and the Private Securities Litigation Reform Act of 1995, which involve risks and uncertainties, including the use of proceeds from the Offering. These statements relate to future events and include, without limitation, the Company's expectation regarding the Offering, the Charter Amendment, the exercise of the Preferred Stock Warrants and the repricing of the February 2018 Preferred Stock Warrants. Although the Company believes that the expectations reflected in such forward-looking statements are reasonable as of the date made, expectations may prove to have been materially different from the results expressed or implied by such forward-looking statements. The Company has attempted to identify forward-looking statements by terminology including "believes," "estimates," "anticipates," "expects," "plans," "intends," "may," "could," "might," "will," "should," "approximately" or other words that convey uncertainty of future events or outcomes. These statements are only predictions and involve known and unknown risks, uncertainties, and other factors, including the Company's need for additional financing and current plans and future needs to scale back operations if adequate financing is not obtained, the success and timing of the Company's clinical trials and regulatory approval of protocols, market conditions and those discussed under the heading "Risk Factors" in the Company's registration statement on Form S-1, as amended (File No. 333-224315), most recent Annual Report on Form 10-K and quarterly reports on Form 10-Q.

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Any forward-looking statements contained in this release speak only as of its date. The Company undertakes no obligation to update any forward-looking statements contained in this release to reflect events or circumstances occurring after its date or to reflect the occurrence of unanticipated events.

### Item 9.01. Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Exhibit
1.1	Underwriting Agreement, dated as of April 27, 2018
3.1	Certificate of Designation of Series B Convertible Preferred Stock
4.1	Form of Preferred Stock Warrant

4.2	Form of Pre-Funded Warrant
10.1	Form of Lock-Up Waiver Agreement
99.1	Press release dated April 27, 2018

**EXHIBIT INDEX**

<u>Exhibit No.</u>	<u>Exhibit</u>
1.1	<a href="#">Underwriting Agreement, dated as of April 27, 2018</a>
3.1	<a href="#">Certificate of Designation of Series B Convertible Preferred Stock</a>
4.1	<a href="#">Form of Preferred Stock Warrant</a>
4.2	<a href="#">Form of Pre-Funded Warrant</a>
10.1	<a href="#">Form of Lock-Up Waiver Agreement</a>
99.1	<a href="#">Press release dated April 27, 2018</a>

**SIGNATURES**

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

Dated: April 30, 2018

Onconova Therapeutics, Inc.

By: /s/ Mark Guerin  
Name: Mark Guerin  
Title: Chief Financial Officer

46,588,234 Shares of Common Stock

Pre-Funded Warrants to Purchase 12,235,295 Shares of Common Stock

and

58,823,529 Warrants to Purchase 1,470,588.225 Shares of Series B Convertible Preferred Stock

Onconova Therapeutics, Inc.

UNDERWRITING AGREEMENT

April 27, 2018

H.C. Wainwright & Co., LLC  
430 Park Avenue, 4th Floor  
New York, New York 10022

Ladies and Gentlemen:

Onconova Therapeutics, Inc. a Delaware corporation (the "Company"), proposes to issue and sell to H.C. Wainwright & Co., LLC (the "Underwriter") an aggregate of 46,588,234 Units (as defined below) and 12,235,295 Pre-Funded Units (as defined below) representing (i) an aggregate of (a) 46,588,234 shares (the "Firm Shares") of the common stock, par value \$0.01 per share, of the Company ("Common Stock") and (b) pre-funded warrants to purchase 12,235,295 shares of Common Stock at an exercise price of \$0.01 per share (the "Pre-Funded Warrants"); and (ii) 58,823,529 warrants (the "Firm Warrants") and, collectively with the Firm Shares and the Pre-Funded Warrants, the "Firm Securities") to purchase an aggregate of 1,470,588.225 shares of the Series B Convertible Preferred Stock, par value \$0.01 per share, of the Company ("Series B Preferred Stock"). The amount and form of the Firm Securities to be purchased by the Underwriter is set forth opposite its name on **Schedule I** hereto. The Company also proposes to sell to the Underwriter, at the option of the Underwriter, up to an additional 8,823,529 shares of Common Stock (the "Option Shares") and/or 8,823,529 warrants to purchase up to an aggregate of 220,588.225 shares of Series B Preferred Stock (the "Option Warrants" and, together with the Option Shares, the "Option Securities"). The Firm Shares and the Option Shares are hereinafter referred to collectively as the "Shares"; the Firm Warrants and the Option Warrants are collectively referred to herein as the "Warrants"; the shares of Series B Preferred Stock issuable upon exercise of the Warrants and the shares of Common Stock issuable upon exercise of the Pre-Funded

Warrants are collectively referred to herein as the "Warrant Shares"; the shares of Common Stock issuable upon conversion of the Series B Preferred Stock issuable under the Warrants are collectively referred to as the "Conversion Shares"; and the Firm Securities, the Option Securities and the Warrant Shares are hereinafter referred to collectively as the "Securities". The Shares and/or Pre-Funded Warrants and the Warrants shall be sold together as a fixed combination, each consisting of (i) one share of Common Stock or one Pre-Funded Warrant, and (ii) one Warrant to purchase 0.025 of a share of Series B Preferred Stock, with each combination consisting of one share of Common Stock and one Warrant to purchase 0.025 of a share of Preferred Stock being referred to herein as a "Unit" and each combination consisting of one Pre-Funded Warrant to purchase one Share of Common Stock and one Warrant to purchase 0.025 Share of Preferred Stock being referred to herein as a "Pre-Funded Unit." The Shares and/or Pre-Funded Warrants and the Warrants in each of the Units or Pre-Funded Units, as applicable, shall be immediately separable and transferable upon issuance. The terms of the Warrants are set forth in the form of Warrant attached hereto as **Exhibit 1** and the terms of the Pre-Funded Warrants are set forth in the form of Pre-Funded Warrant attached hereto as **Exhibit 2**. Units and the Pre-Funded Units will not be issued or certificated. The shares of Common Stock or Pre-Funded Warrants, as the case may be, and the Warrants can only be purchased together but the securities contained in the Units or Pre-Funded units will be issued separately.

The Company confirms as follows its agreements with the Underwriter.

1. (a) The Company represents and warrants to, and agrees with, the Underwriter that, as of the date hereof and as of the Closing Date and each Option Closing Date, if any:

(i) A registration statement of the Company on Form S-1 (File No. 333-224315) in respect of the Securities and one or more pre-effective amendments thereto (collectively, the "Initial Registration Statement") have been filed with the Securities and Exchange Commission (the "Commission"); the Initial Registration Statement and any post-effective amendment thereto, each in the form heretofore delivered to you, have been declared effective by the Commission in such form; other than a registration statement, if any, increasing the size of the offering (a "Rule 462(b) Registration Statement"), filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended (the "Securities Act"), which became effective upon filing, no other document with respect to the Initial Registration Statement has heretofore been filed with the Commission; no stop order suspending the effectiveness of the Initial Registration Statement, any post-effective amendment thereto or the Rule 462(b) Registration Statement, if any, has been issued, no proceeding for that purpose has been initiated or, to the Company's knowledge, threatened by the Commission and any request on the part of the Commission for additional information from the Company has been satisfied in all material respects; any preliminary prospectus included in the Initial Registration Statement, as originally filed or as part of any amendment thereto, or filed with the Commission pursuant to Rule 424(a) of the rules and regulations of the Commission under the Securities Act is hereinafter called a "Preliminary Prospectus"; the various parts of the Initial Registration Statement and the Rule 462(b) Registration Statement, if any, including (i) all documents incorporated or deemed to be incorporated by reference therein, (ii) all schedules and exhibits thereto and (iii) the information contained in the form of final prospectus filed with the Commission pursuant to Rule 424(b) under the Securities Act and deemed by virtue of Rule 430A under the Securities Act to be part of the

Initial Registration Statement at the time it was declared effective or such part of the Rule 462(b) Registration Statement, if any, became or hereafter becomes effective, each as amended at the time such part of the Initial Registration Statement became effective, are hereinafter collectively called the “Registration Statement”; the Preliminary Prospectus relating to the Securities that was included in the Registration Statement immediately prior to the Applicable Time (as defined in Section 1(a)(iii) hereof) is hereinafter called the “Pricing Prospectus”; such final prospectus, in the form first filed pursuant to Rule 424(b) under the Securities Act, is hereinafter called the “Prospectus”; and any “issuer free writing prospectus” as defined in Rule 433 under the Securities Act relating to the Securities is hereinafter called an “Issuer Free Writing Prospectus”; and all references to the Registration Statement, any Preliminary Prospectus, the Pricing Prospectus, the Prospectus, any Issuer Free Writing Prospectus or any amendment or supplement to any of the foregoing shall be deemed to include the copy filed with the Commission pursuant to its Electronic Data Gathering, Analysis and Retrieval system (“EDGAR”). From the time of initial filing of the Initial Registration Statement with the Commission (or, if earlier, the first date on which the Company engaged directly or through any person authorized to act on its behalf in any Testing-the-Waters Communication) through the date hereof, the Company has been and is an “emerging growth company,” as defined in Section 2(a) of the Securities Act (an “Emerging Growth Company”). Any reference to “amend”, “amendment” or “supplement” with respect to the Registration Statement, the Rule 462 Registration Statement, any Preliminary Prospectus, the Pricing Prospectus, the Initial Registration Statement, the Pricing Disclosure Package (as defined below) or the Prospectus shall be deemed to refer to and include any documents filed after the effective date of the Initial Registration Statement, the Registration Statement or the Rule 462 Registration Statement or the date of such Preliminary Prospectus, the Pricing Prospectus, the Pricing Disclosure Package or the Prospectus, as the case may be under the Securities Exchange Act of 1934, as amended, and the rules and regulations of the Commission thereunder (collectively, the “Exchange Act”) that are deemed to be incorporated by reference therein. “Testing-the-Waters Communication” means any oral or written communication with potential investors undertaken in reliance on Section 5(d) of the Securities Act;

(ii) (1) at the respective times the Initial Registration Statement, any Rule 462(b) Registration Statement and any post-effective amendments thereto became effective and at the Closing Date (as defined herein) (and, if any Option Shares are purchased, at each Option Closing Date) (as defined herein), the Initial Registration Statement, any Rule 462(b) Registration Statement and any amendments and supplements thereto complied and will comply in all material respects with the requirements of the Securities Act and the rules and regulations of the Commission thereunder (the “Rules and Regulations”) and did not and will not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading, and (2) at the time the Prospectus or any amendments or supplements thereto were issued and at the Closing Date (and, if any Option Shares are purchased, at each Option Closing Date), neither the Prospectus nor any amendment or supplement thereto included or will include an untrue statement of a material fact or omitted or will omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided that the representations and warranties in clauses (1) and (2) above shall not apply to statements in or omissions from the Registration Statement or the Prospectus made in reliance upon and in strict conformity with information furnished to the Company in writing by the Underwriter expressly for use in the

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Registration Statement or the Prospectus or any amendment or supplement thereto, it being understood and agreed that the only such information provided by the Underwriter is that described as such in Section 9(b) hereof. No order preventing or suspending the use of any Preliminary Prospectus, the Pricing Prospectus or any Issuer Free Writing Prospectus has been issued by the Commission;

Each Preliminary Prospectus, Pricing Prospectus, Issuer Free Writing Prospectus and the Prospectus filed as part of the Initial Registration Statement as originally filed or as part of any amendment thereto, or filed pursuant to Rule 424 under the Securities Act, complied when so filed in all material respects with the requirements of the Securities Act and the Rules and Regulations and each Preliminary Prospectus, Pricing Prospectus, Issuer Free Writing Prospectus and the Prospectus delivered to the Underwriter for use in connection with this offering was identical to the electronically transmitted copies thereof filed with the Commission pursuant to EDGAR, except to the extent permitted by Regulation S-T;

(iii) For the purposes of this Agreement, the “Applicable Time” is 5:45 a.m. (Eastern time) on the date of this Agreement; the Pricing Prospectus as supplemented by the Issuer Free Writing Prospectuses, if any, issued at or prior to the Applicable Time and by the Written Testing-the-Waters Communications (as hereinafter defined), together with the information set forth in Schedule I hereto, taken together (collectively, the “Pricing Disclosure Package”) as of the Applicable Time, did not 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, not misleading; and each Issuer Free Writing Prospectus, if any, and/or Written Testing-the-Waters Communication listed on Schedule II hereto does not conflict with the information contained in the Registration Statement, the Pricing Prospectus or the Prospectus and each such Issuer Free Writing Prospectus and/or Written Testing-the-Waters Communication, as supplemented by and taken together with the Pricing Disclosure Package as of the Applicable Time, did not 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, not misleading; provided, however, that this representation and warranty shall not apply to statements or omissions made in an Issuer Free Writing Prospectus or Written Testing-the-Waters Communication in reliance upon and in conformity with the information furnished in writing to the Company by the Underwriter expressly for use therein;

(iv) The Company has filed a registration statement pursuant to the Exchange Act, to register the Common Stock, and such registration statement has been declared effective; the Company is not, and at the time of filing the Initial Registration Statement, was not an “ineligible issuer,” as defined under Rule 405 under the Securities Act;

(v) Each of the Company and its subsidiaries (each a “Subsidiary”) has been duly incorporated and is validly existing as a corporation or other entity in good standing under the laws of its jurisdiction or organization, with power and authority (corporate and other) to own its properties and conduct its business as currently being carried on and as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, and, in the case of the Company, to enter into and perform its obligations under this Agreement, the Warrants and the

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Pre-Funded Warrants, and have been duly qualified as a foreign corporation or other entity for the transaction of business and is in good standing under the laws of each other jurisdiction in which it owns or leases properties or conducts any business so as to require such qualification, except where the failure to so qualify or be in good standing would not have a material adverse effect on the general affairs, business, prospects, management, properties, operations, condition (financial or otherwise) or results of operations of the Company and its Subsidiaries, taken as a whole (a “Material Adverse Effect”);

(vi) The Company has an authorized capitalization as set forth in the Pricing Prospectus, and all of the issued and outstanding shares of capital stock of the Company have been duly authorized and validly issued, are fully paid and non-assessable and conform to the descriptions thereof contained in the Pricing Prospectus; and none of the issued and outstanding shares of capital stock of the Company are subject to any preemptive or similar rights;

(vii) The Securities which may be issued and sold by the Company to the Underwriter hereunder have been duly authorized and, when issued, delivered and paid for by the Underwriter in accordance with the terms of this Agreement will be validly issued and fully paid and non-assessable and will conform to the descriptions thereof contained in the Prospectus; and, except as otherwise stated in the Registration Statement, in the Pricing Disclosure Package and in the Prospectus, the issuance of such Securities is not subject to any preemptive or similar rights; the Company has filed the Certificate of Designation governing the terms of the Series B Preferred Stock with the Secretary of State of the State of Delaware (the "Certificate of Designation") and the Warrant Shares, when issued, paid for and delivered upon due exercise of the Warrants or the Pre-Funded Warrants, as applicable, will be duly authorized and validly issued, fully paid and non-assessable, free and clear from any preemptive or similar rights, and will be issued in compliance with all applicable securities laws. The Warrant Shares have been reserved for issuance. The Securities and the Conversion Shares, when issued, will conform in all material respects to the descriptions thereof set forth in the Registration Statement, in the Pricing Disclosure Package and in the Prospectus. Upon the approval of the Company's stockholders as required by Delaware law ("Stockholder Approval") of an amendment to the Company's Tenth Amended and Restated Certificate of Incorporation, as amended, to sufficiently increase the number of shares of Common Stock authorized for issuance to cover the conversion of all then-outstanding shares of Series B Preferred Stock into shares of Common Stock (the "Charter Amendment") and the filing of the Charter Amendment with the Secretary of State of the State of Delaware, the Conversion Shares shall be reserved for issuance and, the Conversion Shares, when issued, and delivered upon due conversion of the Warrant Shares, as applicable, will be duly authorized and validly issued, fully paid and non-assessable, free and clear from any preemptive or similar rights, and will be issued in compliance with all applicable securities laws.

(viii) This Agreement, the Warrants and the Pre-Funded Warrants, as applicable, have been duly authorized, executed and delivered by the Company. This Agreement constitutes the legal, valid and binding obligation of the Company and is enforceable against the Company in accordance with its terms, except as enforceability may be limited by applicable bankruptcy, insolvency, reorganization, moratorium or similar laws affecting creditors' rights generally or subject to general principles of equity (regardless of whether such enforceability is considered in a proceeding in equity or at law), and except as enforceability of any indemnification

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or contribution provision may be limited under foreign, federal or state securities laws. When issued, the Warrants and the Pre-Funded Warrants will constitute the legal, valid and binding obligations of the Company, including to issue and sell, upon exercise thereof and payment of the respective exercise prices therefor, the number and type of securities of the Company called for thereby in accordance with the terms thereof, and such Warrants and Pre-Funded Warrants are enforceable against the Company in accordance with their respective terms, except as enforceability may be limited by applicable bankruptcy, insolvency, reorganization, moratorium or similar laws affecting creditors' rights generally or subject to general principles of equity (regardless of whether such enforceability is considered in a proceeding in equity or at law), and except as enforceability of any indemnification or contribution provision may be limited under foreign, federal or state securities laws;

(ix) The issue and sale of the Securities to be sold by the Company hereunder and under the Warrants and the Pre-Funded Warrants, as applicable, the execution hereof and thereof by the Company and the compliance by the Company with all of the provisions hereof and thereof and the consummation of the transactions herein and therein contemplated will not (1) 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 the Subsidiaries is a party or by which the Company or any of the Subsidiaries is bound or to which any of the material property or assets of the Company or any of the Subsidiaries is subject, (2) result in any violation of the provisions of the certificate or articles of incorporation or by-laws (or other organization documents) of the Company or any of the Subsidiaries or any statute or any order, rule or regulation of any court or governmental agency or body having jurisdiction over the Company or any of the Subsidiaries or any of their material properties or (3) require the consent, approval, authorization, order, registration or qualification of or with any such court or governmental agency or body for the issue and sale of the Securities to be sold by the Company hereunder and under the Warrants and the Pre-Funded Warrants, as applicable, or the consummation by the Company of the transactions contemplated hereby and thereby, except the registration under the Securities Act of the Securities and such consents, approvals, authorizations, registrations or qualifications as may be required under state securities, Blue Sky laws, the filing of the Certificate of Designation with the Secretary of State of the State of Delaware, obtaining Stockholder Approval and the filing of the Charter Amendment with the Secretary of State of the State of Delaware, or the rules and regulations of the Nasdaq Stock Market, LLC or the Financial Industry Regulatory Authority in connection with the purchase and distribution of the Securities by the Underwriter;

(x) Ernst & Young, LLP, who have certified certain financial statements of the Company, are independent public accountants as required by the Securities Act and the Rules and Regulations. The financial statements, together with related schedules and notes, incorporated in the Registration Statement and the Pricing Prospectus comply in all material respects with the requirements of the Securities Act and present fairly the consolidated financial position, results of operations and changes in financial position of the Company on the basis stated in the Registration Statement at the respective dates or for the respective periods to which they apply; such statements and related notes have been prepared in accordance with United States generally accepted accounting principles ("GAAP") consistently applied throughout the periods involved, except as disclosed therein; and the selected financial data and the summary financial

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data included in the Pricing Prospectus present fairly the information shown therein and have been compiled on a basis consistent with that of the financial statements incorporated in the Registration Statement. The pro forma financial statements of the Company and the related notes thereto incorporated in the Registration Statement and the Pricing Prospectus present fairly the information shown therein, have been prepared in accordance with the Commission's rules and guidelines with respect to pro forma financial statements and have been properly compiled on the bases described therein, and the assumptions used in the preparation thereof are reasonable and the adjustments used therein are appropriate to give effect to the transactions and circumstances referred to therein. The interactive data in eXtensible Business Reporting Language included or incorporated by reference in the Registration Statement fairly presents the information called for in all material respects and has been prepared in accordance with the Commission's rules and guidelines applicable thereto;

(xi) Neither the Company nor any Subsidiary has sustained since the date of the latest audited financial statements included in the Pricing 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, otherwise than as set forth or contemplated in the Pricing Prospectus; and, since the respective dates as of which information is given in the Registration Statement and the Pricing Prospectus, (1) there has not been any change in the capital stock (other than the issuance of shares of Common Stock upon the exercise or conversion of securities, or the grant of options, restricted stock or other equity-based awards under the Company's existing equity compensation plans) or long-term debt of the Company or any of the Subsidiaries, (2) there has not been any Material Adverse Effect, or any development that would reasonably be expected to result in a Material Adverse Effect, in or affecting the general affairs, business, prospects, management, financial position, shareholders' equity or results of operations of the Company and the Subsidiaries, taken as a whole, (3) there have been no transactions entered into by, and no obligations or liabilities, contingent or otherwise, incurred by the Company or any of the Subsidiaries, whether or not in the ordinary course of business, which are material to the Company and the Subsidiaries, taken as a whole or (4) there has been no dividend or distribution of any kind declared, paid or made by the Company on any class of its capital stock, in each case, otherwise than as set forth or contemplated in the Pricing Prospectus;

(xii) Neither the Company nor any of the Subsidiaries is (1) in violation of its certificate or articles of incorporation or bylaws (or other organization documents) or (2) in violation of any law, ordinance, administrative or governmental rule or regulation applicable to the Company or any of the Subsidiaries, or (3) in violation of any decree of any court or governmental agency or body having jurisdiction over the Company or any of the Subsidiaries, or (4) in default in the performance of any obligation, agreement or condition contained in any bond, debenture, note or any other evidence of indebtedness or in any agreement, indenture, lease or other instrument to which the Company or any of the Subsidiaries is a party or by which any of them or any of their respective properties may be bound, except, in the case of clauses (2), (3) and (4), where any such violation or default, individually or in the aggregate, would not have a Material Adverse Effect;

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(xiii) Each of the Company and each Subsidiary has good and marketable title to all real and tangible property described in the Pricing Prospectus as being owned by it, in each case free and clear of all liens, encumbrances and defects except such as are described in the Pricing Prospectus or are not material to the business of the Company or any Subsidiary; and any real property and buildings described in the Pricing Prospectus as being held under lease by the Company or any Subsidiary are held under valid, subsisting and enforceable leases with such exceptions as are not material and do not materially interfere with the use made and proposed to be made of such property and buildings by the Company or any Subsidiary;

(xiv) Other than as set forth in the Pricing Disclosure Package, there are no legal or governmental proceedings pending to which the Company or any of the Subsidiaries is a party or of which any property of the Company or any of the Subsidiaries is the subject which, if determined adversely to the Company or the Subsidiary, individually or in the aggregate, would have or may reasonably be expected to have a Material Adverse Effect, or would prevent or impair the consummation of the transactions contemplated by this Agreement and by the Warrants and the Pre-Funded Warrants, or which are required to be described in the Registration Statement or the Pricing Prospectus; and, to the Company's knowledge, no such proceedings are threatened or contemplated by governmental authorities or others;

(xv) The Company and the Subsidiaries possess all permits, licenses, approvals, consents and other authorizations (collectively, "Permits") issued by the appropriate federal, state, local or foreign regulatory agencies or bodies necessary to conduct the businesses now operated by them; the Company and the Subsidiaries are in compliance with the terms and conditions of all such Permits and all of the Permits are valid and in full force and effect, except, in each case, where the failure so to comply or where the invalidity of such Permits or the failure of such Permits to be in full force and effect, individually or in the aggregate, would not have a Material Adverse Effect; and neither the Company nor any Subsidiary has received any notice of proceedings relating to the revocation or material modification of any such Permits;

(xvi) No material labor dispute with the employees of the Company or the Subsidiaries exists, or, to the knowledge of the Company, is imminent. The Company is not aware of any existing or imminent labor disturbance by the employees of any of its or any Subsidiary's principal suppliers, manufacturers, customers or contractors, which, individually or in the aggregate, may reasonably be expected to result in a Material Adverse Effect;

(xvii) The Company and the Subsidiaries are insured by insurers of recognized financial responsibility against such losses and risks and in such amounts as are prudent and customary in the businesses in which they are engaged; neither the Company nor any Subsidiary has been refused any insurance coverage sought or applied for; and the Company has no reason to believe that either it or any Subsidiary 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;

(xviii) The Company and each of its Subsidiaries have made and keep books, records and accounts, which, in reasonable detail, accurately and fairly reflect in all material respects the transactions and dispositions of the assets of the Company and its Subsidiaries. The

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Company maintains a system of internal accounting controls sufficient to provide reasonable assurance that (1) transactions are executed in accordance with management's general or specific authorizations; (2) transactions are recorded as necessary to permit preparation of financial statements in conformity with GAAP and to maintain accountability for assets; (3) access to assets is permitted only in accordance with management's general or specific authorization; (4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences; and (5) the interactive data in eXtensible Business Reporting Language included or incorporated by reference in the Registration Statement is in conformity with GAAP and is updated as necessary to comply in all material respects with the requirements of the Securities Act and the Commission's rules and guidelines applicable thereto and present fairly the consolidated financial position, results of operations and changes in financial position of the Company and the Subsidiaries on the basis stated in the Registration Statement at the respective dates or for the respective periods to which they apply;

(xix) Other than as set forth in the Pricing Disclosure Package, since the date of the latest audited financial statements included in the Pricing Prospectus, (a) the Company has not been advised of (1) any significant deficiencies in the design or operation of internal controls that could adversely affect the ability of the Company and each of its Subsidiaries to record, process, summarize and report financial data, or any material weaknesses in internal controls and (2) any fraud, whether or not material, that involves management or other employees who have a significant role in the internal controls



of the Company and each of its Subsidiaries, and (b) since that date, there has been no change in the Company's internal control over financial reporting that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting;

(xx) The Company maintains disclosure controls and procedures (as such term is defined in Rule 13a-15 (e) of the Exchange Act) that comply with the requirements of the Exchange Act; such disclosure controls and procedures are effective in all material respects to perform the functions for which they were established;

(xxi) All U.S. federal income tax returns of the Company and the Subsidiaries required by law to be filed have been filed and all taxes shown by such returns or otherwise assessed, which are due and payable, have been paid, except assessments against which appeals have been or will be promptly taken and as to which adequate reserves have been provided. The Company and the Subsidiaries have filed all other tax returns that are required to have been filed by them pursuant to applicable foreign, state, local or other law, except insofar as the failure to file such returns, individually or in the aggregate, would not result in a Material Adverse Effect, and have paid all taxes due pursuant to such returns or pursuant to any assessment received by the Company or any Subsidiary except for such taxes, if any, as are being contested in good faith and as to which adequate reserves have been provided. The charges, accruals and reserves on the books of the Company and the Subsidiaries in respect of any income and corporation tax liability for any years not finally determined are adequate in all material respects to meet any assessments or re-assessments for additional income tax for any years not finally determined;

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(xxii) There are no statutes, regulations, documents or contracts of a character required to be described in the Registration Statement or the Pricing Prospectus or to be filed as an exhibit to the Registration Statement which are not described or filed as required;

(xxiii) Neither the Company nor any of the Subsidiaries is in violation of any statute or any rule, regulation, decision or order of any governmental agency or body or any court, domestic or foreign, relating to the use, production, disposal or release of hazardous or toxic substances or relating to the protection or restoration of the environment or human exposure to hazardous or toxic substances (collectively, "environmental laws"), owns or operates any real property contaminated with any substance that is subject to any environmental laws, is liable for any off-site disposal or contamination pursuant to any environmental laws, or is subject to any claim relating to any environmental laws, which violation, contamination, liability or claim, individually or in the aggregate, would have a Material Adverse Effect; and the Company is not aware of any pending investigation which would reasonably be expected to lead to such a claim;

(xxiv) Each employee benefit plan, within the meaning of Section 3(3) of the Employee Retirement Income Security Act of 1974, as amended ("ERISA"), that is maintained, administered or contributed to by the Company or any Subsidiary for employees or former employees of the Company and its affiliates has been maintained in compliance with its terms and the requirements of any applicable statutes, orders, rules and regulations, including but not limited to ERISA and the Internal Revenue Code of 1986, as amended (the "Code"), except to the extent that failure to so comply, individually or in the aggregate, would not have a Material Adverse Effect. No prohibited transaction, within the meaning of Section 406 of ERISA or Section 4975 of the Code has occurred with respect to any such plan excluding transactions effected pursuant to a statutory or administrative exemption;

(xxv) Neither the Company nor any of its Subsidiaries, or any director, officer, nor, to the Company's knowledge, agent, employee or other person associated with or acting on behalf of the Company or any of its Subsidiaries, has (i) used any corporate funds for any unlawful contribution, gift, entertainment or other unlawful expense relating to political activity; (ii) made any direct or indirect unlawful payment to any foreign or domestic government official or employee from corporate funds, (iii) violated or is in violation of any provision of the Foreign Corrupt Practices Act of 1977, as amended, or (iv) made any bribe, unlawful rebate, payoff, influence payment, kickback or other unlawful payment;

(xxvi) Solely to the extent that the Sarbanes-Oxley Act of 2002, as amended, and the rules and regulations promulgated in connection therewith (the "Sarbanes-Oxley Act"), including Section 402 related to loans and Sections 302 and 906 related to certifications, are or have been applicable to the Company, there is and has been no failure on the part of the Company or any of the Company's directors or officers, in their capacities as such, to comply in all material respects with any applicable provisions of the Sarbanes-Oxley Act;

(xxvii) Except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company owns or has valid, binding and enforceable licenses or other rights under the patents, patent applications, licenses, inventions, copyrights, know how (including trade secrets and other unpatented and/or unpatentable proprietary or

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confidential information, systems or procedures), trademarks, service marks, trade names or other intellectual property necessary for, or used in the conduct, or the proposed conduct, of the business of the Company in the manner described in the Registration Statement, the Pricing Disclosure Package and the Prospectus (collectively, the "Intellectual Property"); the patents, trademarks, and copyrights, if any, included within the Intellectual Property are valid, enforceable, and subsisting; other than as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, (A) the Company is not obligated to pay a material royalty, grant a license to, or provide other material consideration to any third party in connection with the Intellectual Property, (B) the Company has not received any notice of any claim of infringement, misappropriation or conflict with any asserted rights of others with respect to any of the Company's drug candidates, services, conduct of the business, processes or Intellectual Property, (C) to the knowledge of the Company, neither the conduct of the business, sale nor use of any of the discoveries, inventions, drug candidates, services or processes of the Company referred to in the Registration Statement, the Pricing Disclosure Package or the Prospectus do or will infringe, misappropriate or violate any right or valid patent claim of any third party, (D) none of the technology employed by the Company has been obtained or is being used by the Company in material violation of any contractual obligation binding on the Company or, to the Company's knowledge, upon any of its officers, directors or employees or otherwise in violation of the rights of any persons, (E) to the knowledge of the Company, no third party has any ownership right in or to any Intellectual Property that is owned by the Company, other than any co-owner of any patent constituting Intellectual Property who is listed on the records of the U.S. Patent and Trademark Office (the "USPTO") and any co-owner of any patent application constituting Intellectual Property who is named in such patent application, and, to the knowledge of the Company, no third party has any ownership right in or to any Intellectual Property in any field of use that is exclusively licensed to the Company, other than any licensor to the Company of such Intellectual Property, (F) there is no infringement by third parties of any Intellectual Property, (G) there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the Company's rights in or to any Intellectual Property, and (H) there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the validity or scope of any

Intellectual Property. The Company is in material compliance with the terms of each agreement pursuant to which Intellectual Property has been licensed to the Company, and all such agreements are in full force and effect;

(xxviii) All patents and patent applications owned by or licensed to the Company or under which the Company has rights have, to the knowledge of the Company, been duly and properly filed and maintained; to the knowledge of the Company, the parties prosecuting such patent applications have complied with their duty of candor and disclosure to the USPTO in connection with such applications; and the Company is not aware of any facts required to be disclosed to the USPTO that were not disclosed to the USPTO and which would preclude the grant of a patent in connection with any such application or would reasonably be expected to form the basis of a finding of invalidity with respect to any patents that have issued with respect to such applications. To the Company's knowledge, all patents and patent applications owned by the Company and filed with the USPTO or any foreign or international patent authority (the "Company Patent Rights") and all patents and patent applications in-licensed by the Company and filed with the USPTO or any foreign or international patent authority (the "In-licensed Patent Rights") have been duly and properly filed; the Company believes it has complied with its duty of candor and

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disclosure to the USPTO for the Company Patent Rights and, to the Company's knowledge, the licensors of the In-licensed Patent Rights have complied with their duty of candor and disclosure to the USPTO for the In-licensed Patent Rights;

(xxix) Except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company: (A) is and at all times has been in material compliance with all statutes, rules and regulations of the FDA and other comparable Governmental Entities applicable to the ownership, testing (including clinical trials and pre-clinical studies), development, manufacture, packaging, processing, use, distribution, marketing, labeling, promotion, sale, offer for sale, storage, import, export or disposal of any product under development, manufactured, sold or distributed by the Company ("Applicable Laws"); (B) has not received any FDA Form 483, notice of adverse finding, warning letter, untitled letter or other correspondence or notice from the FDA or any Governmental Authority alleging or asserting material noncompliance with any Applicable Laws or any licenses, certificates, approvals, clearances, exemptions, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws ("Authorizations"); (C) possesses all material Authorizations and such Authorizations are valid and in full force and effect and the Company is not in material violation of any term of any such Authorizations; (D) has not received notice of any claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from the FDA or any Governmental Authority or third party alleging that any product operation or activity is in material violation of any Applicable Laws or Authorizations and has no knowledge that the FDA, Health Canada or any Governmental Authority or third party is considering any such claim, litigation, arbitration, action, suit, investigation or proceeding; (E) has not received notice that the FDA, Health Canada or any Governmental Authority has taken, is taking or intends to take action to materially limit, suspend, modify or revoke any material Authorizations and has no knowledge that the FDA, Health Canada or any Governmental Authority is considering such action; and (F) 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 reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were materially complete and correct on the date filed (or were corrected or supplemented by a subsequent submission);

(xxx) To the extent applicable, the Company has operated and currently is in compliance with all applicable health care laws, rules and regulations (except where such failure to operate or non-compliance would not, singly or in the aggregate, result in a Material Adverse Effect), including, without limitation, (i) the Federal, Food, Drug and Cosmetic Act (21 U.S.C. §§ 301 et seq.) and the rules and regulations promulgated thereunder (collectively, "FFDCA"); (ii) all applicable federal, state, and local and all applicable similar foreign healthcare laws, including, without limitation, the federal Anti-kickback Statute (42 U.S.C. § 1320a-7b(b)), the U.S. Physician Payments Sunshine Act (42 U.S.C. § 1320a-7h), the civil False Claims Act (31 U.S.C. §§ 3729 et seq.), the criminal False Claims Law (42 U.S.C. § 1320a-7b(a)), all criminal laws relating to healthcare fraud and abuse, including but not limited to 18 U.S.C. Sections 286 and 287, the healthcare fraud criminal provisions under the U.S. Health Insurance Portability and Accountability Act of 1996 ("HIPAA") (42 U.S.C. Section 1320d et seq.); (iii) HIPAA, as amended by the Health Information Technology for Economic Clinical Health Act (42 U.S.C.

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Sections 17921 - 17931); ; (iv) the regulations promulgated pursuant to such laws; and (vii) any other similar local, state, federal, or foreign laws (collectively, the "Health Care Laws"). The Company has not received written notice or other communication of any claim, action, suit, audit, survey, proceeding, hearing, enforcement, investigation, arbitration or other action ("Action") from any court or arbitrator or Governmental Authority or regulatory authority or third party alleging that any product operation or activity is in violation of any Health Care Laws, and, to the Company's knowledge, no such Action is threatened. The Company is not a party to and does not have any ongoing reporting obligations pursuant to any corporate integrity agreement, deferred prosecution agreement, monitoring agreement, consent decree, settlement order, plan of correction or similar agreement imposed by any governmental or regulatory authority. Additionally, neither the Company, nor to the Company's actual knowledge, any of its employees, officers or directors, has been excluded, suspended or debarred from participation in any U.S. state or federal health care program or human clinical research pursuant to 42 U.S.C. § 1320a-7, 21 U.S.C. § 335a, or similar laws, or, to the knowledge of the Company, is subject to a governmental inquiry, investigation, proceeding, or other similar action that could reasonably be expected to result in debarment, suspension, or exclusion;

(xxxi) The non-clinical studies and clinical trials conducted by or, to the Company's knowledge, on behalf of the Company were and, if still ongoing, are being conducted in all material respects in accordance with applicable experimental protocols, procedures and controls pursuant to accepted professional scientific standards, current good clinical practices and current good laboratory practices as required under applicable Laws and all Authorizations and Applicable Laws, including, without limitation, the FFDCA, and the International Conference on Harmonization Guidelines; the descriptions of the results of such studies and clinical trials contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus are, to the Company's knowledge, accurate and complete in all material respects and fairly present the material data derived from such studies and clinical trials; except to the extent disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company is not aware of any studies or clinical trials, the results of which the Company believes reasonably call into question the study or trial results described or referred to in the Registration Statement, the Pricing Disclosure Package and the Prospectus when viewed in the context in which such results are described and the clinical state of development; and, except to the extent disclosed in the Registration Statement, the Pricing Disclosure Package or the Prospectus, the Company has not received any notices or correspondence from the FDA or any Governmental Entity requiring the termination or suspension of any studies or clinical trials conducted by or on behalf of the Company, other than ordinary course communications with respect to modifications in connection with the design and implementation of such clinical trials;

(xxxii) Except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, or as otherwise disclosed to the Underwriter, there are no persons with registration rights or other similar rights to have securities registered pursuant to the Registration Statement or otherwise registered by the Company under the Securities Act;

(xxxiii) The Company is not and, after giving effect to the offering and sale of the Securities as contemplated herein and the application of the net proceeds therefrom, including the proceeds received upon the exercise of the Warrants and the Pre-Funded Warrants,

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as described in the Pricing Prospectus, will not be an “investment company”, as such term is defined in the Investment Company Act of 1940, as amended (the “Investment Company Act”);

(xxxiv) The Company has not distributed and, prior to the later to occur of the Closing Date (as defined in Section 4 hereof) and completion of distribution of the Securities, will not distribute any offering materials in connection with the offering and sale of the Securities, other than the Pricing Prospectus, the Prospectus and, subject to compliance with Section 6 hereof, any Issuer Free Writing Prospectus; and the Company has not taken and will not take, directly or indirectly, any action designed to cause or result in, or which constitutes or might reasonably be expected to constitute, the stabilization or manipulation of the price of any security of the Company to facilitate the sale of the Securities. The Company (a) has not alone engaged in any Testing-the-Waters Communication and (b) has not authorized anyone other than the Underwriter to engage in Testing-the-Waters Communications. The Company reconfirms that the Underwriter has been authorized to act on its behalf in undertaking Testing-the-Waters Communications. The Company has not distributed any Written Testing-the-Waters Communications. “Written Testing-the-Waters Communication” means any Testing-the-Waters Communication that is a written communication within the meaning of Rule 405 under the Securities Act;

(xxxv) The statistical and market and industry-related data included in the Pricing Prospectus and the Prospectus are based on or derived from sources which the Company believes to be reliable and accurate or represent the Company’s good faith estimates that are made on the basis of data derived from such sources, and the Company has obtained the written consent to the use of such data from sources to the extent required;

(xxxvi) Any certificate signed by any officer of the Company delivered to the Underwriter or to counsel for the Underwriter shall be deemed a representation and warranty by the Company to the Underwriter as to the matters covered thereby.

2. Subject to the terms and conditions herein set forth, (a) the Company agrees to sell to the Underwriter and the Underwriter agrees to purchase from the Company, at a purchase price per Unit of \$0.391 and \$0.381 per Pre-Funded Unit (each a “Purchase Price”), the Firm Securities and (b) in the event and to the extent that the Underwriter shall exercise the election to purchase Option Shares and/or Option Warrants as provided below, the Company agrees to sell to the Underwriter, and the Underwriter agrees to purchase from the Company, at price per Share of \$0.3818 (the “Share Option Purchase Price”) and \$0.0092 per Warrant (the “Warrant Option Purchase Price”), the Option Shares and/or the Option Warrants.

The Company hereby grants to the Underwriter the right to purchase at its election up to 8,823,529 Option Shares at the Share Option Purchase Price, and/or up to 8,823,529 Option Warrants to purchase 220,588.225 shares of Series B Preferred Stock at the Warrant Option Purchase Price. The Underwriter may exercise its option to acquire Option Shares and/or Option Warrants in whole or in part from time to time only by written notice from the Underwriter to the Company, given within a period of thirty (30) calendar days after the date of this Agreement and setting forth the number of Option Shares and/or Option Warrants to be purchased and the date on which such Option Shares and/or Option Warrants are to be delivered, as determined by the Underwriter but in no event earlier than the Closing Date or, unless the Underwriter and the

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Company otherwise agree in writing, earlier than two or later than ten business days after the date of such notice.

3. It is understood that the Underwriter proposes to offer the Firm Shares, Firm Warrants and Pre-Funded Warrants for sale to the public upon the terms and conditions set forth in the Prospectus.

4. The Company will deliver the Firm Shares to the Underwriter through the facilities of the Depository Trust Company (“DTC”) for the account of the Underwriter, against payment of the purchase price therefor in Federal (same day) funds by official bank check or checks or wire transfer drawn to the order of the Company at the office of Lowenstein Sandler LLP, 1251 Avenue of the Americas, New York, NY 10020, at 10:00 A.M., New York time, on May 1, 2018, or at such other time not later than seven full business days thereafter as the Underwriter and the Company determine, such time being herein referred to as the “Closing Date”. The Company will deliver the certificates for the Pre-Funded Warrants and the Firm Warrants, as applicable, against payment of the purchase price therefor (a) in the case of any Pre-Funded Warrants and the Firm Warrants included as part of the Pre-Funded Units, by the purchasers thereof and (b) in the case of the Firm Warrants included as part of the Units, by the Underwriter, in definitive form, in such denominations and registered in such names as the Underwriter or its designees request, to the purchasers thereof on the Closing Date. For purposes of Rule 15c6-1 under the Exchange Act, the Closing Date (if later than the otherwise applicable settlement date) shall be the settlement date for payment of funds and delivery of the Securities. In the event that a purchaser delivers a Notice of Exercise (as defined in the Pre-Funded Warrants) on or prior to 12:00 P.M., New York time on the Closing Date, to exercise any Pre-Funded Warrants between the date hereof and the Closing Date, the Company shall deliver Warrant Shares with respect to such Pre-Funded Warrants to such purchaser on the Closing Date in connection with such Notice of Exercise. The Firm Shares and/or Pre-Funded Warrants and the Firm Warrants will be issued separately and may be transferred separately immediately upon issuance.

Each time for the delivery of and payment for the Option Shares and Option Warrants, being herein referred to as an “Option Closing Date”, which may be the Closing Date, shall be determined by the Underwriter as provided above. The Company will deliver the Option Shares being purchased on each Option Closing Date to the Underwriter through the facilities of DTC for the account of the Underwriter, against payment of the purchase price therefor in Federal (same day) funds by official bank check or checks or wire transfer drawn to the order of the Company at the above office of Lowenstein Sandler LLP, 1251 Avenue of the Americas, New York, NY 10020, at 10:00 A.M., New York time on the applicable Option Closing Date. The Company will deliver the certificates for the Option Warrants being purchased on each Option Closing Date against payment of the purchase price therefor by the Underwriter, in definitive form, in such denominations and registered in such names as the Underwriter or its designees request, to the purchasers thereof on such Option Closing Date. The Option Shares and the Option Warrants, if any, will be issued separately and may be transferred separately immediately upon issuance.

The Company hereby grants the Underwriter (or any affiliate designated by the Underwriter) the right of first refusal for a period of ten (10) months from the Closing Date to act, in the case the Company or any Subsidiary decides to raise funds by means of a public offering or

a private placement of equity or debt securities using an underwriter or placement agent, as sole book-running manager, sole underwriter or sole placement agent for such financing.

At the Closing Date and any Option Closing Date, the Company shall pay the Underwriter a management fee equal to 1.0% of the gross proceeds raised at the Closing Date and each Option Closing Date.

5. The Company covenants and agrees with the Underwriter as follows:

(a) The Company, subject to Section 5(b), will comply with the requirements of Rule 430A under the Securities Act, and will notify the Underwriter promptly (and in any event with 24 hours), and confirm the notice in writing, (i) when any post-effective amendment to the Registration Statement shall become effective, or any supplement to the Prospectus or any amended prospectus shall have been filed, to furnish the Underwriter with copies thereof, and to file promptly all material required to be filed by the Company with the Commission pursuant to Rule 433(d) under the Securities Act, (ii) of the receipt of any comments from the Commission, (iii) of any request by the Commission for any amendment to the Registration Statement or any amendment or supplement to the Prospectus or for additional information, (iv) of the issuance by the Commission of any stop order suspending the effectiveness of the Registration Statement or of any order preventing or suspending the use of any Preliminary Prospectus, or of the suspension of the qualification of the Securities for offering or sale in any jurisdiction, or of the initiation or, to the Company's knowledge, the threatening of any proceedings for any of such purposes; and (v) if the Company ceases to be an Emerging Growth Company at any time prior to the later of (A) completion of the distribution of the Securities within the meaning of the Securities Act and (B) completion of the 120-day restricted period referred to in Section 5(j) hereof. The Company will promptly effect the filings necessary pursuant to Rule 424(b) under the Securities Act and will take such steps as it deems necessary to ascertain promptly whether the form of prospectus transmitted for filing under Rule 424(b) was received for filing by the Commission and, in the event that it was not, it will promptly file such prospectus. The Company will make every reasonable effort to prevent the issuance of any stop order and, if any stop order is issued, to obtain the lifting thereof at the earliest possible moment.

(b) The Company will give the Underwriter notice of its intention to file or prepare any amendment to the Registration Statement (including any filing under Rule 462(b) under the Securities Act), or any amendment, supplement or revision to the Prospectus, or any Issuer Free Writing Prospectus, will furnish the Underwriter with copies of any such documents a reasonable amount of time prior to such proposed filing or use, as the case may be, and will not file or use any such document to which the Underwriter or counsel for the Underwriter shall reasonably object.

(c) The Company will use its reasonable best efforts to qualify the Securities for offering and sale under the securities laws of such jurisdictions as you may reasonably request and to comply with such laws in all material respects so as to permit the continuance of sales and dealings therein in such jurisdictions for as long as may be necessary to complete the distribution of the Securities, provided that nothing in this Section 5(c) shall require the Company to qualify as a foreign corporation in any jurisdiction in which it is not already so qualified, to file a general

consent to service of process in any jurisdiction, or subject itself to taxation in any jurisdiction if it is not otherwise so subject.

(d) The Company has furnished or, upon written request, will deliver to the Underwriter, without charge, four signed copies of the Initial Registration Statement as originally filed, any Rule 462(b) Registration Statement and of each amendment to each (including exhibits filed therewith or incorporated by reference therein) and signed copies of all consents and certificates of experts, and will also, upon your written request, deliver to the Underwriter, without charge, a conformed copy of the Registration Statement as originally filed and of each amendment thereto (without exhibits) the Underwriter. The copies of the Registration Statement and each amendment thereto furnished to the Underwriter 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.

(e) The Company has delivered to the Underwriter, without charge, as many written and electronic copies of each Preliminary Prospectus as the Underwriter reasonably requested, and the Company hereby consents to the use of such copies for purposes permitted by the Securities Act. The Company will furnish to the Underwriter, without charge, prior to 5:00 P.M. New York time on the business day next succeeding the date of this Agreement and from time to time thereafter during the period when the Prospectus is required to be delivered in connection with sales of the Securities under the Securities Act or the Exchange Act or in lieu thereof, the notice referred to in Rule 173(a) under the Securities Act, such number of written and electronic copies of the Prospectus (as amended or supplemented) as the Underwriter may reasonably request. The Prospectus and any amendments or supplements thereto furnished to the Underwriter 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.

(f) The Company will comply with the Securities Act and the Rules and Regulations so as to permit the completion of the distribution of the Securities as contemplated in this Agreement and in the Prospectus. If at any time when, in the reasonable opinion of counsel for the Underwriter, a prospectus is required to be delivered in connection with sales of the Securities under the Securities Act or the Exchange Act (or in lieu thereof, the notice referred to in Rule 173(a) under the Securities Act), any event shall occur or condition shall exist as a result of which it is necessary, in the reasonable opinion of counsel for the Underwriter or for the Company, to amend the Registration Statement or amend or supplement the Prospectus in order that the Prospectus will not include any untrue statements of a material fact or omit to state a material fact necessary in order to make the statements therein not misleading in the light of the circumstances existing at the time it (or in lieu thereof, the notice referred to in Rule 173(a) under the Securities Act) is delivered to a purchaser, or if it shall be necessary, in the reasonable opinion of either such counsel, at any such time to amend the Registration Statement or amend or supplement the Prospectus in order to comply with the requirements of the Securities Act or the Rules and Regulations, the Company will promptly prepare and file with the Commission, subject to Section 5(b), such amendment or supplement as may be necessary to correct such statement or omission or to make the Registration Statement or the Prospectus comply with such requirements, and the Company will furnish to the Underwriter such number of written and electronic copies of such amendment or supplement as the Underwriter may reasonably request. The Company will

provide the Underwriter with notice of the occurrence of any event during the period specified above that may give rise to the need to amend or supplement the Registration Statement or the Prospectus as provided in the preceding sentence promptly after the occurrence of such event. If at any time following the distribution of any Written Testing-the-Waters Communication there occurred or occurs an event or development as a result of which such Written Testing-the-Waters Communication 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 existing at that subsequent time, not misleading, the Company will promptly notify the Underwriter and will promptly amend or supplement, at its own expense, such Written Testing-the-Waters Communication to eliminate or correct such untrue statement or omission.

(g) The Company will make generally available (within the meaning of Section 11(a) of the Securities Act) to its security holders and to the Underwriter as soon as practicable, but not later than 45 days after the end of its fiscal quarter in which the first anniversary date of the effective date of the Registration Statement occurs, an earnings statement (in form complying with the provisions of Rule 158 under the Securities Act) covering a period of at least twelve consecutive months beginning after the effective date of the Registration Statement.

(h) The Company will use the net proceeds received by it from the sale of the Securities in the manner specified in the Pricing Disclosure Package under the heading "Use of Proceeds".

(i) The Company will use its reasonable best efforts to maintain the listing for quotation of the Common Stock (including the Shares and the shares of Common Stock issuable upon exercise of the Pre-Funded Warrants) on the Nasdaq Capital Market. As of the Closing Date, such shares will have been duly authorized for listing on the Nasdaq Capital Market subject to official notice of issuance.

(j) During a period of one hundred twenty (120) days from the date of the Prospectus, the Company will not, without the prior written consent of the Underwriter, (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend or otherwise transfer or dispose of, directly or indirectly, or announce the issuance or proposed issuance of, any Common Stock or any securities convertible into or exercisable or exchangeable for Common Stock or (ii) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of Common Stock, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Common Stock or such other securities, in cash or otherwise, other than (1) the Securities to be sold hereunder, (2) the issuance of equity-based awards granted pursuant to the Company's benefit plans existing on the date hereof that are referred to in the Prospectus, as such plans may be amended, (3) the issuance of shares of Common Stock upon the exercise of any such equity-based awards or (4) the issuance of equity-based securities in connection with collaborations, partnerships or other strategic transactions approved by a majority of the disinterested directors of the Company, provided that any such transaction shall only be with 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; provided that such securities are issued as "restricted securities" (as defined in Rule 144) and carry no registration rights that require or permit the filing of any registration statement in connection therewith during the prohibition period in this Section 5(j).

(k) The Company, during the period when the Prospectus is required to be delivered in connection with sales of the Securities under the Securities Act or the Exchange Act (or in lieu thereof, the notice referred to in Rule 173(a) under the Securities Act), will file all documents required to be filed with the Commission pursuant to the Exchange Act within the time periods required by the Exchange Act and the rules and regulations of the Commission thereunder.

(l) The Company will file with the Commission such information on Form 10-Q or Form 10-K as may be required pursuant to Rule 463 under the Securities Act.

(m) During a period of ten months from the effective date of the Registration Statement, the Company will furnish to you copies of all reports or other communications (financial or other) furnished to shareholders generally, and to deliver to you (i) as soon as they are available, copies of any reports and financial statements furnished to or filed with the Commission or any national securities exchange on which any class of securities of the Company is listed; provided that the Company will be deemed to have furnished such reports and financial statements to the extent they are filed on EDGAR.

(n) If the Company elects to rely upon Rule 462(b) under the Securities Act, the Company will file a Rule 462(b) Registration Statement with the Commission in compliance with Rule 462(b) by 10:00 P.M., Washington, D.C. time, on the date of this Agreement, and at the time of filing either to pay to the Commission the filing fee for the Rule 462(b) Registration Statement or to give irrevocable instructions for the payment of such fee pursuant to Rule 111(b) under the Securities Act.

(o) If so requested by the Underwriter, the Company shall cause to be prepared and delivered, at its expense, within one business day from the effective date of this Agreement, to the Underwriter an "electronic Prospectus" to be used by the Underwriter in connection with the offering and sale of the Securities. As used herein, the term "electronic Prospectus" means a form of the most recent Preliminary Prospectus, any Issuer Free Writing Prospectus or the Prospectus, and any amendment or supplement thereto, that meets each of the following conditions: (i) it shall be encoded in an electronic format, reasonably satisfactory to the Underwriter, that may be transmitted electronically by the Underwriter to offerees and purchasers of the Securities, (ii) it shall disclose the same information as such paper Preliminary Prospectus, Issuer Free Writing Prospectus or the Prospectus, as the case may be; and (iii) it shall be in or convertible into a paper format or an electronic format, reasonably satisfactory to the Underwriter, that will allow investors to store and have continuously ready access to such Preliminary Prospectus, Issuer Free Writing Prospectus or the Prospectus at any future time, without charge to investors (other than any fee charged for subscription to the Internet generally). The Company hereby confirms that, if so requested by the Underwriter, it has included or will include in the Prospectus filed with the Commission an undertaking that, upon receipt of a request by an investor or his or her representative, the Company shall transmit or cause to be transmitted promptly,

without charge, a paper copy of such paper Preliminary Prospectus, Issuer Free Writing Prospectus or the Prospectus to such investor or representative.

(p) The Company will use its reasonable efforts to promptly obtain Stockholder Approval within 45 days from the date of the Prospectus and file the Charter Amendment to sufficiently increase its authorized shares of Common Stock to cover the conversion of all outstanding shares of Series B Preferred Stock issuable upon exercise of the Warrants.

6. (a) The Company represents and agrees that, without the prior consent of the Underwriter, it has not made and will not make any offer relating to the Securities that would constitute a “free writing prospectus” as defined in Rule 405 under the Securities Act; the Underwriter represents and agrees that, without the prior consent of the Company, it has not made and will not make any offer relating to the Securities that would constitute a free writing prospectus; any such free writing prospectus the use of which has been consented to by the Company and the Underwriter is listed on Schedule II hereto;

(b) The Company has complied and will comply with the requirements of Rule 433 under the Securities Act applicable to any Issuer Free Writing Prospectus, including timely filing with the Commission or retention where required and legending; the Company represents that it has satisfied and agrees that it will satisfy the conditions under Rule 433 under the Securities Act to avoid a requirement to file with the Commission any electronic road show;

(c) The Company agrees that if at any time following issuance of an Issuer Free Writing Prospectus any event occurred or occurs as a result of which such Issuer Free Writing Prospectus would conflict with the information in the Registration Statement, the Pricing Prospectus or the Prospectus or, when considered together with the information in the Pricing Prospectus and other Issuer Free Writing Prospectuses, would include an untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in light of the circumstances then prevailing, not misleading, the Company will give prompt notice thereof to the Underwriter and, if requested by the Underwriter, will prepare and furnish without charge to the Underwriter an Issuer Free Writing Prospectus or other document which will correct such conflict, statement or omission; provided, however, that this covenant shall not apply to any statements or omissions in an Issuer Free Writing Prospectus made in reliance upon and in strict conformity with information furnished in writing to the Company by an Underwriter through the Underwriter expressly for use therein.

7. Subject to Section 10 hereof, the Company covenants and agrees with the Underwriter that, whether or not the transactions contemplated by this Agreement are consummated, (a) the Company will pay or cause to be paid (i) \$50,000 for non-accountable expenses, (ii) up to \$100,000 for reasonable, documented fees and expenses of legal counsel and other reasonable, out-of-pocket expenses, and (iii) for the services of an escrow agent and any actual out-of-pocket cost of such clearing agent settlement and financing, so long as the cost does not exceed \$10,000; provided, however, that such reimbursement amount in no way shall limit the indemnification and contribution provisions of this Agreement.

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8. The obligation of the Underwriter hereunder to purchase the Securities on the Closing Date or each Option Closing Date, as the case may be, are subject to the performance by the Company of its obligations hereunder and to the following additional conditions:

(a) The Prospectus shall have been filed with the Commission pursuant to Rule 424(b) under the Securities Act within the applicable time period prescribed for such filing by the Rules and Regulations and in accordance with Section 5(a); all material required to be filed by the Company pursuant to Rule 433(d) under the Securities Act shall have been filed with the Commission within the applicable time period prescribed for such filing by Rule 433 under the Securities Act; if the Company has elected to rely upon Rule 462(b) under the Securities Act, the Rule 462(b) Registration Statement shall have become effective by 10:00 P.M., Washington, D.C. time, on the date of this Agreement; no stop order suspending the effectiveness of the Registration Statement or any part thereof or the Prospectus or any part thereof or any Issuer Free Writing Prospectus shall have been issued and no proceeding for that purpose shall have been initiated or, to the knowledge of the Company, threatened by the Commission or any state securities commission; and all requests for additional information on the part of the Commission shall have been complied with to the reasonable satisfaction of the staff of the Commission.

(b) The representations and warranties of the Company contained herein and in the Warrants and the Pre-Funded Warrants, as applicable, are true and correct on and as of the Closing Date or the Option Closing Date, as the case may be, as if made on and as of the Closing Date or the Option Closing Date, as the case may be, and the Company shall have complied with all agreements and all conditions on its part to be performed or satisfied hereunder at or prior to the Closing Date or the Option Closing Date, as the case may be.

(c) Subsequent to the execution and delivery of this Agreement and prior to the Closing Date or the Option Closing Date, as the case may be, there shall not have occurred any downgrading, nor shall any notice have been given of (i) any downgrading, (ii) any intended or potential downgrading or (iii) any review or possible change that does not indicate an improvement, in the rating accorded any securities of or guaranteed by the Company or any Subsidiary by any “nationally recognized statistical rating organization”, as such term is defined for purposes of Rule 436(g)(2) under the Securities Act.

(d) (i) Neither the Company nor any Subsidiary shall have sustained since the date of the latest audited financial statements included in the Pricing 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, otherwise than as set forth or contemplated in the Pricing Prospectus and except as described in the Registration Statement and the Pricing Disclosure Package, and (ii) since the respective dates as of which information is given in the Registration Statement and the Prospectus, (1) there shall not have been any change in the capital stock or long-term debt of the Company or any Subsidiary or (2) there shall not have been any Material Adverse Effect, or any development involving a prospective Material Adverse Effect, in or affecting the general affairs, business, prospects, management, financial position, shareholders’ equity or results of operations of the Company and the Subsidiaries, considered as one enterprise, the effect of which, in any such case described in clause (i) or (ii), is in the judgment of the Underwriter so material and adverse as to make it

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impracticable or inadvisable to proceed with the public offering or the delivery of the Securities being delivered at such Closing Date or Option Closing Date, as the case may be, on the terms and in the manner contemplated in the Pricing Prospectus.

(e) The Underwriter shall have received on and as of the Closing Date or the Option Closing Date, as the case may be, a certificate of an executive officer of the Company, reasonably satisfactory to the Underwriter, to the effect (1) set forth in Sections 8(b) (with respect to the respective representations, warranties, agreements and conditions of the Company) and 8(c), (2) that none of the situations set forth in clause (i) or (ii) of Section 8(d) shall have occurred and (3) that no stop order suspending the effectiveness of the Registration Statement has been issued and to the knowledge of the Company, no proceedings for that purpose have been instituted or are pending or contemplated by the Commission.

(f) On the Closing Date or Option Closing Date, as the case may be, Morgan, Lewis & Bockius LLP, counsel for the Company, shall have furnished to the Underwriter their favorable written opinion, dated the Closing Date or the Option Closing Date, as the case may be, in form and substance satisfactory to counsel for the Underwriter.

(g) On the effective date of the Registration Statement and, if applicable, the effective date of the most recently filed post-effective amendment to the Registration Statement, Ernst & Young, LLP shall have furnished to the Underwriter a letter, dated the date of delivery thereof, in form and substance satisfactory to the Underwriter, containing statements and information of the type customarily included in accountants' "comfort letters" to underwriters with respect to the financial statements and certain financial information contained in the Registration Statement and the Prospectus.

(h) On the Closing Date or Option Closing Date, as the case may be, the Underwriter shall have received from Ernst & Young, LLP a letter, dated the Closing Date or such Option Closing Date, as the case may be, to the effect that they reaffirm the statements made in the letter or letters furnished pursuant to Section 8(g), except that the specified date referred to shall be a date not more than three business days prior to the Closing Date or such Option Closing Date, as the case may be.

(i) On the Closing Date or Option Closing Date, as the case may be, Lowenstein Sandler LLP, counsel for the Underwriter, shall have furnished to the Underwriter their favorable opinion dated the Closing Date or the Option Closing Date, as the case may be, with respect to the due authorization and valid issuance of the Securities, the Registration Statement, the Prospectus and other related matters as the Underwriter may reasonably request, and such counsel shall have received such papers and information as they may reasonably request to enable them to pass upon such matters.

(j) The Shares and the shares issuable upon exercise of the Pre-Funded Warrants to be delivered on the Closing Date or Option Closing Date, as the case may be, shall have been approved for listing on the Nasdaq Capital Market, subject to official notice of issuance.

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(k) FINRA shall have confirmed that it has not raised any objection with respect to the fairness and reasonableness of the underwriting terms and conditions.

(l) The Underwriter shall have received "lock-up" agreements, each substantially in the form of Exhibit A hereto, from each executive officer and director of the Company, and such agreements shall be in full force and effect on the Closing Date or Option Closing Date, as the case may be.

(m) On the Closing Date or Option Closing Date, as the case may be, Khalilian Sira LLC, intellectual property counsel for the Company, shall have furnished to the Underwriter their favorable written opinion, dated the Closing Date or the Option Closing Date, as the case may be, in form and substance satisfactory to counsel for the Underwriter.

(n) On or prior to the Closing Date or Option Closing Date, as the case may be, the Company shall have furnished to the Underwriter such further information, certificates and documents as the Underwriter shall reasonably request.

(o) On or after the Applicable Time there shall not have occurred any of the following: (i) a suspension or material limitation in trading in securities generally on the Nasdaq Capital Market; (ii) a suspension or material limitation in trading in the Company's securities on the Nasdaq Capital Market; (iii) a general moratorium on commercial banking activities declared by any of Federal or New York State authorities or a material disruption in commercial banking or securities settlement or clearance services in the U.S.; (iv) the outbreak or escalation of hostilities involving the U.S. or the declaration by the U.S. of a national emergency or war or (v) the occurrence of any other calamity or crisis or any change in financial, political or economic conditions in the U.S. or elsewhere, if the effect of any such event specified in clause (iv) or (v) in the judgment of the Underwriter makes it impracticable or inadvisable to proceed with the public offering or the delivery of the Securities being delivered at such Closing Date or Option Closing Date, as the case may be, on the terms and in the manner contemplated in the Prospectus.

(p) The Company shall have filed the Certificate of Designation with the Secretary of State of the State of Delaware.

(q) The Company shall have delivered executed copies of the Warrants and the Pre-Funded Warrants, as applicable, to the public purchasers thereof.

If any condition specified in this Section 8 shall not have been fulfilled when and as required to be fulfilled, this Agreement may be terminated, subject to the provisions of Section 12, by the Underwriter by notice to the Company at any time at or prior to the Closing Date or Option Closing Date, as the case may be, and such termination shall be without liability of any party to any other party, except as provided in Section 12.

9. (a) The Company agrees to indemnify and hold harmless the Underwriter and each person, if any, who controls the Underwriter within the meaning of Section 15 of the Securities Act or Section 20(a) of the Exchange Act against any and all losses, liabilities, claims, damages and expenses whatsoever as incurred (including without limitation, reasonable attorneys'

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fees and any and all reasonable expenses whatsoever incurred in investigating, preparing or defending against any litigation, commenced or threatened, or any claim whatsoever, and any and all amounts paid in settlement of any claim or litigation), joint or several, to which they or any of them may become subject under the Securities Act, the Exchange Act or otherwise, insofar as such losses, liabilities, claims, damages or expenses (or actions in respect thereof) arise

out of or are based upon any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, or any post-effective amendment thereof, any Preliminary Prospectus, the Pricing Prospectus or the Prospectus, or in any supplement thereto or amendment thereof, any Issuer Free Writing Prospectus, any Written Testing-the-Waters Communication, or any "issuer information" filed or required to be filed pursuant to Rule 433(d) under the Securities Act, or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading; provided, however, that the Company will not be liable in any such case to the extent that any such loss, liability, claim, damage or expense arises out of or is based upon any such untrue statement or alleged untrue statement or omission or alleged omission made in the Registration Statement, or any post-effective amendment thereof, any Preliminary Prospectus, the Pricing Prospectus or the Prospectus, or in any supplement thereto or amendment thereof, any Issuer Free Writing Prospectus, or any Written Testing-the-Waters Communication in reliance upon and in strict conformity with written information furnished to the Company by or on behalf of the Underwriter expressly for use therein, it being understood and agreed that the only such information furnished by the Underwriter is the information described as such in Section 9(b) below.

(b) The Underwriter agrees to indemnify and hold harmless the Company, each of the directors of the Company, each of the officers of the Company who shall have signed the Registration Statement, and each other person, if any, who controls the Company within the meaning of Section 15 of the Securities Act or Section 20(a) of the Exchange Act, against any losses, liabilities, claims, damages and expenses whatsoever as incurred (including without limitation, reasonable attorneys' fees and any and all reasonable expenses whatsoever incurred in investigating, preparing or defending against any litigation, commenced or threatened, or any claim whatsoever, and any and all amounts paid in settlement of any claim or litigation), joint or several, to which they or any of them may become subject under the Act, the Exchange Act or otherwise, insofar as such losses, liabilities, claims, damages or expenses (or actions in respect thereof) arise out of or are based upon any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, or any post-effective amendment thereof, or any Preliminary Prospectus, the Pricing Prospectus or the Prospectus, or in any supplement thereto or amendment thereof, any Issuer Free Writing Prospectus or any Written Testing-the-Waters Communication, or arise out of or are based upon the omission or alleged omission to state therein a material fact necessary to make the statements therein not misleading, in each case to the extent, but only to the extent, that any such loss, liability, claim, damage or expense arises out of or is based upon any such untrue statement or alleged untrue statement or omission or alleged omission made therein in reliance upon and in strict conformity with written information furnished to the Company by or on behalf of the Underwriter, it being understood and agreed that the only such information furnished by the Underwriter consists of the following information in the Prospectus furnished on behalf of the Underwriter: the last paragraph at the bottom of the cover page concerning the timing of the delivery of the shares, the concession and reallowance figures appearing in the third paragraph under the caption "Underwriting" and the information contained

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in the first and third paragraphs in the section entitled Stabilization, Short Positions and Penalty Bids under the caption "Underwriting".

(c) Promptly after receipt by an indemnified party under Section 9(a) or 9(b) of notice of the commencement of any action, such indemnified party shall, if a claim in respect thereof is to be made against the indemnifying party under such Section, notify each party against whom indemnification is to be sought in writing of the commencement thereof (but the failure so to notify an indemnifying party shall not relieve it from any liability which it may have under this Section 9). In case any such action is brought against any indemnified party, and it notifies an indemnifying party of the commencement thereof, the indemnifying party will be entitled to participate therein, and jointly with any other indemnifying party similarly notified, to the extent it may elect by written notice delivered to the indemnified party promptly after receiving the aforesaid notice from such indemnified party, to assume the defense thereof with counsel reasonably satisfactory to such indemnified party (who shall not, except with the consent of the indemnified party, be counsel to the indemnified party). Notwithstanding the foregoing, the indemnified party or parties shall have the right to employ its or their own counsel in any such case, but the fees and expenses of such counsel shall be at the expense of such indemnified party or parties unless (i) the employment of such counsel shall have been authorized in writing by one of the indemnifying parties in connection with the defense of such action, (ii) the indemnifying parties shall not have employed counsel to have charge of the defense of such action within a reasonable time after notice of commencement of the action, or (iii) such indemnified party or parties shall have reasonably concluded based on advice from outside counsel that there may be defenses available to it or them which are different from or additional to those available to one or all of the indemnifying parties (in which case the indemnifying parties shall not have the right to direct the defense of such action on behalf of the indemnified party or parties), in any of which events the reasonable fees and expenses of such counsel shall be borne by the indemnifying parties. In no event shall the indemnifying parties be liable for fees and expenses of more than one counsel (in addition to any local counsel) separate from their own counsel for all indemnified parties in connection with any one action or separate but similar or related actions in the same jurisdiction arising out of the same general allegations or circumstances, which counsel, in the event of indemnified parties under Section 9(a), shall be selected by the Underwriter. No indemnifying party shall, without the written consent of the indemnified party, effect the settlement or compromise of, or consent to the entry of any judgment with respect to, any pending or threatened action or claim in respect of which indemnification or contribution may be sought hereunder (whether or not the indemnified party is an actual or potential party to such action or claim) unless such settlement, compromise or judgment (i) includes an unconditional release of the indemnified party from all liability arising out of such action or claim and (ii) does not include a statement as to or an admission of fault, culpability or a failure to act, by or on behalf of any indemnified party. An indemnifying party shall not be liable for any settlement of any action or claim effected without its written consent (which consent will not be unreasonably withheld, conditioned or delayed).

(d) If the indemnification provided for in this Section 9 is unavailable to or insufficient to hold harmless an indemnified party under Section 9(a) or Section 9(b) in respect of any losses, liabilities, claims, damages or expenses (or actions in respect thereof) referred to therein, then each indemnifying party shall contribute to the amount paid or payable by such indemnified party as a result of such losses, liabilities, claims, damages or expenses (or actions in

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respect thereof) in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and the Underwriter on the other from the offering of the Securities. If, however, the allocation provided by the immediately preceding sentence is not permitted by applicable law, then each indemnifying party shall contribute to such amount paid or payable by such indemnified party in such proportion as is appropriate to reflect not only such relative benefits but also the relative fault of the Company on the one hand and the Underwriter on the other in connection with the statements or omissions which resulted in such losses, liabilities, claims, damages or expenses (or actions in respect thereof), as well as any other relevant equitable considerations. The relative benefits received by the Company on the one hand and the Underwriter on the other from the offering of the Securities shall be deemed to be in the same proportion as the total net proceeds from the offering (before deducting expenses) received by the Company bear to the total underwriting discounts and commissions received by the Underwriter, in each case as set forth in the table on the cover page of the Prospectus. The relative fault 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 on the one hand or the Underwriter on the other and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission.

The Company and the Underwriter agree that it would not be just and equitable if contributions pursuant to this Section 9(d) were determined by pro rata allocation (even if the Underwriter were treated as one entity for such purpose) or by any other method of allocation which does not take account of the equitable considerations referred to above in this Section 9(d). The amount paid or payable by an indemnified party as a result of the losses, liabilities, claims, damages or expenses (or actions in respect thereof) referred to above in this Section 9(d) shall be deemed to include any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any such action or claim. Notwithstanding the provisions of this Section 9(d), the Underwriter shall not be required to contribute any amount in excess of the amount by which the total price at which the Shares underwritten by it and distributed to the public were offered to the public exceeds the amount of any damages which the Underwriter has otherwise been required to pay by reason of such untrue or alleged untrue statement or omission or alleged omission.

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. The Underwriter's obligations in this Section 9(d) to contribute are several in proportion to their respective underwriting obligations and not joint.

(e) The obligations of the parties to this Agreement contained in this Section 9 are not exclusive and shall not limit any rights or remedies which may otherwise be available to any indemnified party at law or in equity.

10. If the Underwriter shall default in its obligations to purchase the Securities hereunder on the Closing Date or the Option Closing Date, as the case may be, and arrangements satisfactory to the Underwriter and the Company for the purchase of such shares of Common Stock by other persons are not made within forty-eight (48) hours after such default, this Agreement shall

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terminate; provided, in the event of any termination of this Agreement pursuant to this Section 10, the Company shall not be obligated to reimburse the Underwriter on account of any expenses, including expenses to be paid or reimbursed by it pursuant to Section 7.

11. Notwithstanding anything herein contained, this Agreement (or the obligations of the Underwriter with respect to any Option Shares and Option Warrants which have yet to be purchased) may be terminated, subject to the provisions of Section 12, in the absolute discretion of the Underwriter, by notice given to the Company, if after the execution and delivery of this Agreement and prior to the Closing Date or the Option Closing Date, as the case may be, (a) trading generally on the NYSE American or the New York Stock Exchange or on the Nasdaq Global Select Market, the Nasdaq Global Market or the Nasdaq Capital Market shall have been suspended or materially limited, or minimum or maximum prices for trading have been fixed, or maximum ranges for prices have been required, by any of said exchanges or by such system or by order of the Commission, FINRA or any other governmental or regulatory authority, (b) trading of any securities of or guaranteed by the Company or any Subsidiary shall have been suspended on any exchange or in any over-the-counter market, (c) a general moratorium on commercial banking activities in New York shall have been declared by Federal, New York State or Maryland State authorities or a new restriction materially adversely affecting the distribution of the Firm Shares or the Option Shares, as the case may be, shall have become effective, or (d) there has occurred any material adverse change in the financial markets in the U.S. or the international financial markets, any outbreak of hostilities or escalation thereof or other calamity or crisis or any change or development involving a prospective change in national or international political, financial or economic conditions, in each case the effect of which is such as to make it, in the judgment of the Underwriter, impracticable to market the Securities to be delivered on the Closing Date or Option Closing Date, as the case may be, or to enforce contracts for the sale of the Securities.

If this Agreement is terminated pursuant to this Section 11, such termination will be without liability of any party to any other party except as provided in Section 12 hereof.

12. The respective indemnities, agreements, representations, warranties and other statements of the Company or its officers and of the Underwriter set forth in or made pursuant to this Agreement will remain in full force and effect, regardless of any investigation, or statement as to the results thereof, made by or on behalf of the Underwriter, the Company or any of their respective representatives, officers or directors or any controlling person, and will survive delivery of and payment for the Securities. If this Agreement is terminated pursuant to Section 8 or 11 or if for any reason the purchase of any of the Securities by the Underwriter is not consummated, the Company shall remain responsible for the actual, out-of-pocket expenses incurred by the Underwriter pursuant to Section 7, the respective obligations of the Company and the Underwriter pursuant to Section 9 and the provisions of Sections 12, 13 and 16 shall remain in effect and, if any Securities have been purchased hereunder the representations and warranties in Section 1 and all obligations under Section 5, and Section 6 shall also remain in effect. If this Agreement shall be terminated by the Underwriter under Section 8 or otherwise because of any failure or refusal on the part of the Company to comply with the terms or to fulfill any of the conditions of this Agreement (other than solely by reason of the failure of the Underwriter to perform its obligations hereunder), or if for any reason the Company shall be unable to perform its obligations under this Agreement (other than solely by reason of the failure of the Underwriter to perform its obligations

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hereunder) or any condition of the Underwriter's obligations cannot be fulfilled, the Company agrees to reimburse the Underwriter for all out-of-pocket expenses (including the fees and expenses of its counsel) reasonably incurred by the Underwriter in connection with this Agreement or the offering contemplated hereunder.

13. This Agreement shall inure to the benefit of and be binding upon the Company and the Underwriter, the officers and directors of the Company referred to herein, any controlling persons referred to herein and their respective successors and assigns. Nothing expressed or mentioned in this Agreement is intended or shall be construed to give any other person, firm or corporation any legal or equitable right, remedy or claim under or in respect of this Agreement or any provision herein contained. No purchaser of Securities from the Underwriter shall be deemed to be a successor or assign by reason merely of such purchase.

14. All notices and other communications hereunder shall be in writing and shall be deemed to have been duly given upon receipt thereof by the recipient if mailed or transmitted by any standard form of telecommunication. Notices to the Underwriter shall be given to the Underwriter, c/o H.C.

15. This Agreement may be signed in counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument.

16. THIS AGREEMENT SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK, WITHOUT REGARD TO SUCH STATE'S PRINCIPLES OF CONFLICTS OF LAWS.

17. The parties hereby submit to the jurisdiction of and venue in the federal courts located in the City of New York, New York in connection with any dispute related to this Agreement, any transaction contemplated hereby, or any other matter contemplated hereby.

18. The Company acknowledges and agrees that (i) the purchase and sale of the Securities pursuant to this Agreement, including the determination of the public offering price of the Securities and any related discounts and commissions, is an arm's-length commercial transaction between the Company on the one hand, and the Underwriter, on the other, (ii) in connection therewith and with the process leading to such transaction the Underwriter is acting solely as a principal and not the agent or fiduciary of the Company or its stockholders, creditors, employees or any other party, (iii) no Underwriter has assumed an advisory or fiduciary responsibility in favor of the Company with respect to the offering contemplated hereby or the process leading thereto (irrespective of whether the Underwriter has advised or is currently advising the Company on other matters) or any other obligation to the Company except the obligations expressly set forth in this Agreement, and (iv) the Company has consulted its own legal and financial advisors to the extent it deemed appropriate. The Company agrees that it will not claim that the Underwriter has

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rendered advisory services of any nature or respect, or owes a fiduciary or similar duty to the Company, in connection with such transaction or the process leading thereto.

19. The Company acknowledges that the Underwriter's research analysts and research departments are required to be independent from their respective investment banking divisions and are subject to certain regulations and internal policies, and that the Underwriter's research analysts may hold views and make statements or investment recommendations and/or publish research reports with respect to the Company and/or the offering that differ from the views of their respective investment banking divisions. The Company hereby waives and releases, to the fullest extent permitted by law, any claims that the Company may have against the Underwriter with respect to any conflict of interest that may arise from the fact that the views expressed by their independent research analysts and research departments may be different from or inconsistent with the views or advice communicated to the Company by the Underwriter's investment banking divisions. The Company acknowledges that the Underwriter is a full service securities firm and as such from time to time, subject to applicable securities laws, may effect transaction for its own account or the account of its customers and hold long or short positions in debt or equity securities of the companies that may be the subject of the transactions contemplated by this Agreement.

20. Notwithstanding anything herein to the contrary, the Company is authorized to disclose to any persons the U.S. federal and state income tax treatment and tax structure of the potential transaction and all materials of any kind (including tax opinions and other tax analyses) provided to the Company relating to that treatment and structure, without the Underwriter imposing any limitation of any kind. However, any information relating to the tax treatment and tax structure shall remain confidential (and the foregoing sentence shall not apply) to the extent necessary to enable any person to comply with securities laws. For this purpose, "tax structure" is limited to any facts that may be relevant to that treatment.

21. This Agreement (together with the other agreements and documents being delivered pursuant to or in connection with this Agreement) constitutes the entire agreement of the parties hereto with respect to the subject matter hereof and thereof, and supersedes all prior agreements and understandings of the parties, oral and written, with respect to the subject matter hereof. Except as otherwise contemplated herein, it is understood and agreed by the parties hereto that all other binding terms and conditions of those certain engagement letters between the Company and H.C. Wainwright & Co., LLC, dated January 24, 2018 and April 16, 2018, shall remain valid and binding on, and enforceable against, the Company and in full force and effect in accordance with the terms thereof.

22. The Company and the Underwriter hereby irrevocably waives, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Agreement or the transactions contemplated hereby.

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If the foregoing is in accordance with your understanding of our agreement, please sign and return to the Company a counterpart hereof, whereupon this instrument will become a binding agreement among the Company and the Underwriter.

Very truly yours,

ONCONOVA THERAPEUTICS, INC.

By: /s/ Ramesh Kumar, Ph.D.

Name: Ramesh Kumar, Ph.D.

Title: President and CEO

Accepted as of the date hereof:

H.C. WAINWRIGHT & CO., LLC

By: /s/ Edward D. Silvera  
Name: Edward D. Silvera  
Title: Chief Operating Officer

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SCHEDULE I

	Number of Firm Shares and Pre-Funded Warrants to be Purchased from the Company	Number of Firm Warrants to be Purchased from the Company	Number of Option Shares to be Purchased if the Option to Purchase additional Shares and/or Warrants is Fully Exercised	Number of Option Warrants to be Purchased if the Option to Purchase additional Shares and/or Warrants is Fully Exercised
<b>H.C. Wainwright &amp; Co., LLC</b>	<u>58,823,529</u>	<u>58,823,529</u>	<u>8,823,529</u>	<u>8,823,529</u>

Number of Shares of Firm Shares: 46,588,234

Number of Pre-Funded Warrants: 12,235,295

Number of Firm Warrants: 58,823,529 to purchase 1,470,588.225 shares of Series B Preferred Stock

Number of Option Shares: 8,823,529

Number of Option Warrants: 8,823,529 to purchase 220,588.225 shares of Series B Preferred Stock

Public Offering Price per Unit: \$0.425

Public Offering Price per Pre-Funded Unit: \$0.415

Pre-Funded Warrant Exercise Price: \$0.01

Warrant Exercise Price: \$0.425

Underwriting Discount per Unit and Pre-Funded Unit: \$0.034

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SCHEDULE II

Free Writing Prospectuses and/or Testing-the-Water Communications

None.

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EXHIBIT A

**LOCK-UP AGREEMENT**

April , 2018

H.C. Wainwright & Co., LLC  
430 Park Avenue, 4th Floor  
New York, New York 10022

Ladies and Gentlemen:

The undersigned refers to the proposed Underwriting Agreement (the "Underwriting Agreement") among Onconova Therapeutics, Inc., a Delaware corporation (the "Company"), and the several underwriters named therein (the "Underwriters"). As an inducement to the Underwriters to execute the Underwriting Agreement in connection with the proposed public offering (the "Offering") of securities of the Company pursuant to a Registration Statement on Form S-1, the undersigned hereby agrees that from the date hereof and until 120 days after the public offering date set forth on the final prospectus used for the Offering (the "Public Offering Date") pursuant to the Underwriting Agreement (such 120 day period being referred to herein as the "Lock-Up Period"), the undersigned will not (and will cause any immediate family member, any partnership, corporation or other entity within the undersigned's control, and any trustee of any trust that holds shares of common stock, par value \$0.01 per share ("Common Stock") of the Company or other securities of the Company for the benefit of the undersigned or such immediate family member not to) offer, sell, contract to sell (including any short sale), pledge, hypothecate, establish an open "put equivalent position" within the meaning of Rule 16a-1(h) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), grant any option, right or warrant for the sale of, purchase any option or contract to sell, sell any option or contract to purchase, or

otherwise encumber, dispose of or transfer, or grant any rights with respect to, directly or indirectly, any shares of Common Stock or securities convertible into or exchangeable or exercisable for any shares of Common Stock, enter into a transaction which would have the same effect, or enter into any swap, hedge or other arrangement that transfers, in whole or in part, any of the economic consequences of ownership of the Common Stock, whether any such aforementioned transaction is to be settled by delivery of the Common Stock or such other securities, in cash or otherwise, or publicly disclose the intention to make any such offer, sale, pledge or disposition, or to enter into any such transaction, swap, hedge or other arrangement, without, in each case, the prior written consent of H.C. Wainwright & Co., LLC (“HCW”), which consent may be withheld in HCW’s sole discretion. For purposes of this Lock-Up Agreement (the “Agreement”), “immediate family member” shall mean (i) the spouse of the undersigned and (ii) any lineal descendent, stepchild, parent, stepparent, grandparent, sibling, stepsibling, son-in-law, daughter-in-law, brother-in-law, sister-in-law, nephew or niece, including any such relationship by fact of legal adoption, of the undersigned or such spouse, in each case living in the undersigned’s household or whose principal residence is the undersigned’s household (regardless of whether such immediate family member may at the time be living

elsewhere due to educational activities, health care treatment, military service, temporary internship or employment or otherwise).

The foregoing restrictions shall not apply to *bona fide* gifts by the undersigned, provided that (a) each resulting transferee of the Company’s securities executes and delivers to HCW an agreement satisfactory to HCW certifying that such transferee is bound by the terms of this Agreement and has been in compliance with the terms hereof since the date first above written as if it had been an original party hereto and (b) to the extent any interest in the Company’s securities is retained by the undersigned (or an immediate family member), such securities shall remain subject to the restrictions contained in this Agreement.

In addition, the undersigned agrees that, during the Lock-Up Period, without the prior written consent of HCW (which consent may be withheld in its sole discretion): (a) the undersigned will not request, make any demand for or exercise any right with respect to, the registration of any Common Stock or any security convertible into or exercisable or exchangeable for Common Stock and (b) the undersigned waives any and all notice requirements and rights with respect to the registration of any such security pursuant to any agreement, understanding or otherwise to which the undersigned is a party.

Any Common Stock received upon exercise of options granted to the undersigned will also be subject to this Agreement. Any acquisition of Common Stock by the undersigned in the open market on or after the Public Offering Date (but not the disposition of such Common Stock) will not be subject to this Agreement. A transfer of Common Stock or other securities of the Company may be made (i) to an immediate family member, (ii) to a trust for the benefit of the undersigned or an immediate family member, (iii) by will or intestate succession upon the death of the undersigned, (iv) pursuant to operation of law, including pursuant to a domestic order or negotiated divorce settlement, and (v) if the undersigned is a corporation, limited liability company, partnership, trust, or other business entity, as part of a distribution, transfer or distribution by the undersigned to its stockholders, members, partners, beneficiaries or other equity holders, provided in each case (i) through (v) that the transferee agrees in writing prior to such transfer to be bound by the terms of this Agreement as if it were a party hereto and further provided that no filing under Section 16(a) of the Exchange Act reporting a reduction in beneficial ownership of shares of Common Stock shall be required or shall be voluntarily made during the Lock-Up Period.

The undersigned may also (a) transfer securities of the Company (i) to the Company in connection with the “cashless” exercise of options to purchase shares of Common Stock pursuant to employee benefit plans existing as of the date hereof and disclosed or incorporated by reference in the final prospectus relating to the Offering (provided that the restrictions on transfer set forth in this Agreement shall apply to shares of Common Stock issued upon such exercise, and provided further that no voluntary filing under Section 16(a) of the Exchange Act reporting such transfer shall be made during the Lock-Up Period and that if such filing is required to be made that the filing clearly indicate that such transfer or disposition is related to cashless net exercise) and (ii) pursuant to a bona fide third party tender offer, merger, consolidation or other similar transaction made to all holders of the Company’s capital stock involving a change of control of the Company (provided that in the event that the tender offer, merger, consolidation or other similar transaction is not completed, the undersigned’s Common Stock shall remain subject to the restrictions contained in this Agreement), (b) exercise any option to purchase Common Stock of the Company granted

under any equity incentive plan or stock purchase plan of the Company existing as of the date hereof and disclosed or incorporated by reference in the final prospectus relating to the Offering (provided that the restrictions on transfer set forth in this Agreement shall apply to shares of Common Stock issued upon such exercise, and provided further that no filing under Section 16(a) of the Exchange Act reporting such exercise shall be made during the Lock-Up Period, and that if such a filing is required to be made that the filing clearly indicate that it is related to such exercise) and (c) enter into a written plan meeting the requirements of Rule 10b5-1 under the Exchange Act relating to the sale or other disposition of securities of the Company (provided that the securities subject to such plan may not be sold or otherwise disposed of until after the expiration of the Lock-Up Period, and that the entry into such plan is not publicly disclosed, including in any filing under the Exchange Act).

In furtherance of the foregoing, the Company and its transfer agent and registrar are hereby authorized to (a) decline to make any transfer of shares of Common Stock if such transfer would constitute a violation or breach of this Agreement and (b) place legends and stop transfer instructions on any such shares of Common Stock owned or beneficially owned by the undersigned.

*[Signature page follows]*

This Agreement is irrevocable and shall be binding on the undersigned and the successors, heirs, personal representatives and assigns of the undersigned. This Agreement shall be governed by and construed in accordance with the laws of the State of New York, without regard to choice of law rules. This Agreement shall lapse and become null and void if the Public Offering Date shall not have occurred on or before May 31, 2018.

Very truly yours,

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(Name - Please Print)

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(Signature)

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(Name of Signatory, in the case of entities - Please Print)

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(Title of Signatory, in the case of entities - Please Print)

Address:

Accepted and Agreed:

**Onconova Therapeutics, Inc.**

By: \_\_\_\_\_  
Name:  
Title:

**ONCONOVA THERAPEUTICS, INC.**

**CERTIFICATE OF DESIGNATION OF PREFERENCES,  
RIGHTS AND LIMITATIONS  
OF  
SERIES B CONVERTIBLE PREFERRED STOCK**

PURSUANT TO SECTION 151 OF THE  
DELAWARE GENERAL CORPORATION LAW

The undersigned, Ramesh Kumar, Ph.D., does hereby certify that:

1. He is the President, Chief Executive Officer of Onconova Therapeutics, Inc., a Delaware corporation (the "Corporation").
2. The Corporation is authorized to issue 5,000,000 shares of preferred stock, of which 1,044,488 shares have been designated as Series A Convertible Preferred Stock, par value \$0.01 per share (the "Series A Preferred Stock");
3. The following resolutions were duly adopted by the board of directors of the Corporation (the "Board of Directors"):
  - WHEREAS, the certificate of incorporation of the Corporation provides for a class of its authorized stock known as preferred stock, consisting of 5,000,000 shares, \$0.01 par value per share, issuable from time to time in one or more series;
  - WHEREAS, 1,044,488 of such preferred shares have already been designated as Series A Preferred Stock;
  - WHEREAS, the Board of Directors is authorized to fix the dividend rights, dividend rate, voting rights, conversion rights, rights and terms of redemption and liquidation preferences of any wholly unissued series of preferred stock and the number of shares constituting any series and the designation thereof, of any of them; and
  - WHEREAS, it is the desire of the Board of Directors, pursuant to its authority as aforesaid, to fix the rights, preferences, restrictions and other matters relating to a series of the preferred stock, which shall consist of 1,796,875 shares of the preferred stock which the Corporation has the authority to issue, as follows:

**TERMS OF SERIES B CONVERTIBLE PREFERRED STOCK**

Section 1. Designation, Amount and Par Value. The series of preferred stock shall be designated as its Series B Convertible Preferred Stock (the "Preferred Stock") and the number of shares so designated shall be up to 1,796,875 (which shall not be subject to increase without the written consent of holders of a majority in interest of the Preferred Stock then outstanding (each, a "Holder" and collectively, the "Holders")). Each share of Preferred Stock shall have a par value of \$0.01 per share and a stated value equal to \$17.00 (the "Stated Value").

Section 2. Definitions. For the purposes hereof, the following terms shall have the following meanings:

"Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 of the Securities Act.

"Alternate Consideration" shall have the meaning set forth in Section 7(d).

"Beneficial Ownership Limitation" shall have the meaning set forth in Section 6(d).

"Business Day" means any day except any Saturday, any Sunday, any day which is a federal legal holiday in the United States or any day on which banking institutions in the State of New York are authorized or required by law or other governmental action to close.

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"Buy-In" shall have the meaning set forth in Section 6(c)(iv).

"Charter Amendment Date" means the date on which the Corporation publicly announces through the filing of a Current Report on Form 8-K that an amendment to the Corporation's Tenth Amended and Restated Certificate of Incorporation, as amended, to sufficiently increase the Corporation's authorized shares of Common Stock to cover the conversion of all outstanding shares of Series B Preferred Stock into Common Stock has been filed with the Secretary of State of the State of Delaware.

"Closing Date" means the Trading Day on which all of the Transaction Documents have been executed and delivered by the applicable parties thereto and all conditions precedent to the Corporation's obligations to deliver the Securities have been satisfied or waived.

"Commission" means the United States Securities and Exchange Commission.

"Common Stock" means the Corporation's common stock, par value \$0.01 per share, and stock of any other class of securities into which such securities may hereafter be reclassified or changed.

“Common Stock Equivalents” means any securities of the Corporation or the Subsidiaries which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, rights, options, warrants or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

“Conversion Amount” means the sum of the Stated Value at issue.

“Conversion Date” shall have the meaning set forth in Section 6(a)

“Conversion Price” shall have the meaning set forth in Section 6(b).

“Conversion Shares” means, collectively, the shares of Common Stock issuable upon conversion of the shares of Preferred Stock in accordance with the terms hereof.

“Exchange Act” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

“Fundamental Transaction” shall have the meaning set forth in Section 7(d)

“Holder” shall have the meaning given such term in Section 2.

“Initial Conversion Date” means the next business day after the Charter Amendment Date.

“Liquidation” shall have the meaning set forth in Section 5.

“New York Courts” shall have the meaning set forth in Section 8(d).

“Notice of Conversion” shall have the meaning set forth in Section 6(a).

“Person” means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

“Preferred Stock” shall have the meaning set forth in Section 2.

“Representative” means H.C. Wainwright & Co., LLC

“Securities” means the Preferred Stock, the Warrants, the Warrant Shares and the Underlying Shares.

“Securities Act” means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

“Share Delivery Date” shall have the meaning set forth in Section 6(c).

“Stated Value” shall have the meaning set forth in Section 1, as the same may be increased pursuant to Section 3.

“Subsidiary” means any subsidiary of the Corporation as set forth on Exhibit 21 to the Corporation’s Annual Report on Form 10-K most recently filed with the Commission.

“Successor Entity” shall have the meaning set forth in Section 7(d).

“Trading Day” means a day on which the principal Trading Market is open for business.

“Trading Market” means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE MKT, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, the New York Stock Exchange (or any successors to any of the foregoing).

“Transaction Documents” means this Certificate of Designation, the Underwriting Agreement, the Warrants, all exhibits and schedules thereto and hereto and any other documents or agreements executed in connection with the transactions contemplated pursuant to the Underwriting Agreement.

“Transfer Agent” means EQ Shareowner Services, the current transfer agent of the Corporation, with a mailing address of 1110 Centre Pointe Curve #101, Mendota Heights, MN 55120, and any successor transfer agent of the Corporation.

“Underlying Shares” means the shares of Common Stock issued and issuable upon exercise of the Warrants and conversion of the Preferred Stock.

“Underwriting Agreement” means the underwriting agreement, dated as of April 27, 2018, between the Corporation and the Representative, as the sole book-running manager, modified and supplemented from time to time in accordance with its terms.

“Warrants” means, collectively, the Preferred Stock purchase warrants delivered to the holders on the Closing Date in accordance with the Underwriting Agreement, which Warrants shall be exercisable immediately and have a term of exercise which will expire on the 18-month anniversary of the Charter Amendment Date, at which point the Warrants will automatically be exercised on a cashless basis.

“Warrant Shares” means the shares of Preferred Stock issuable upon exercise of the Warrants.

Section 3. Dividends. Except for stock dividends or distributions for which adjustments are to be made pursuant to Section 7, Holders shall be entitled to receive, and the Corporation shall pay, dividends on shares of Preferred Stock equal (on an as-if-converted-to-Common-Stock basis) to and in the same

form as dividends actually paid on shares of the Common Stock when, as and if such dividends are paid on shares of the Common Stock. No other dividends shall be paid on shares of Preferred Stock.

**Section 4. Voting Rights.** Except as otherwise provided herein or as otherwise required by law, the Preferred Stock shall have no voting rights. However, as long as any shares of Preferred Stock are outstanding, the Corporation shall not, without the affirmative vote of the Holders of a majority of the then outstanding shares of the Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Preferred Stock or alter or amend this Certificate of Designation, (b) increase the number of authorized shares of Preferred Stock, or (c) enter into any agreement with respect to any of the foregoing.

**Section 5. Liquidation.** Upon any liquidation, dissolution or winding-up of the Corporation, whether voluntary or involuntary (a "Liquidation"), the Holders shall be entitled to receive out of the assets, whether capital or surplus, of the Corporation the same amount that a holder of Common Stock would receive if the Preferred Stock were fully converted (disregarding for such purpose any conversion limitations hereunder) to Common Stock which amounts shall be paid pari passu with all holders of Common Stock. The Corporation shall mail written notice of any such Liquidation, not less than 45 days prior to the payment date stated therein, to each Holder.

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#### Section 6. Conversion.

a) **Conversions at Option of Holder.** Each share of Preferred Stock shall be convertible, at any time and from time to time from and after the Initial Conversion Date at the option of the Holder thereof, into that number of shares of Common Stock (subject to the limitations set forth in Section 6(d)) determined by dividing the Stated Value of such share of Preferred Stock by the Conversion Price. Holders shall effect conversions by providing the Corporation with the form of conversion notice attached hereto as Annex A (a "Notice of Conversion"). Each Notice of Conversion shall specify the number of shares of Preferred Stock to be converted, the number of shares of Preferred Stock owned prior to the conversion at issue, the number of shares of Preferred Stock owned subsequent to the conversion at issue and the date on which such conversion is to be effected, which date may not be prior to the date the applicable Holder delivers by facsimile such Notice of Conversion to the Corporation (such date, the "Conversion Date"). If no Conversion Date is specified in a Notice of Conversion, the Conversion Date shall be the date that such Notice of Conversion to the Corporation is deemed delivered hereunder. No ink-original Notice of Conversion shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Conversion form be required. The calculations and entries set forth in the Notice of Conversion shall control in the absence of manifest or mathematical error. To effect conversions of shares of Preferred Stock, a Holder shall not be required to surrender the certificate(s) representing the shares of Preferred Stock to the Corporation unless all of the shares of Preferred Stock represented thereby are so converted, in which case such Holder shall deliver the certificate representing such shares of Preferred Stock promptly following the Conversion Date at issue. Shares of Preferred Stock converted into Common Stock in accordance with the terms hereof shall be canceled and shall not be reissued.

b) **Conversion Price.** The conversion price for the Preferred Stock shall equal \$0.425, subject to adjustment herein (the "Conversion Price").

c) **Mechanics of Conversion**

i) **Delivery of Conversion Shares Upon Conversion.** Not later than the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined below) after each Conversion Date (the "Share Delivery Date"), the Corporation shall deliver, or cause to be delivered, to the converting Holder (A) the number of Conversion Shares being acquired upon the conversion of the Preferred Stock, which Conversion Shares shall be free of restrictive legends and trading restrictions (except to the extent the Holder is subject to certain restrictions under applicable securities laws) and (B) a bank check in the amount of accrued and unpaid dividends. The Corporation shall deliver the Conversion Shares electronically through the Depository Trust Company or another established clearing corporation performing similar functions. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Corporation's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Conversion.

ii) **Failure to Deliver Conversion Shares.** If, in the case of any Notice of Conversion, such Conversion Shares are not delivered to or as directed by the applicable Holder by the Share Delivery Date, the Holder shall be entitled to elect by written notice to the Corporation at any time on or before its receipt of such Conversion Shares, to rescind such Conversion, in which event the Corporation shall promptly return to the Holder any original Preferred Stock certificate delivered to the Corporation and the Holder shall promptly return to the Corporation the Conversion Shares issued to such Holder pursuant to the rescinded Conversion Notice.

iii) **Obligation Absolute.** The Corporation's obligation to issue and deliver the Conversion Shares upon conversion of Preferred Stock in accordance with the terms hereof are absolute and unconditional, irrespective of any action or inaction by a Holder to enforce the same, any waiver or consent with respect to any provision hereof, the recovery of any judgment against any Person or any action to enforce the same, or any setoff, counterclaim, recoupment, limitation or termination, or any breach or alleged breach by such Holder or any other Person of any obligation to the Corporation or any violation or alleged violation of law by such Holder or any other person, and irrespective of any other circumstance which might otherwise limit such obligation of the Corporation to such Holder in connection with the issuance of such Conversion Shares; provided, however, that such delivery shall not operate as a waiver by the Corporation of any such action that the Corporation may have against such Holder. In the event a Holder shall elect to convert any or all of the Stated Value of its Preferred Stock, the Corporation may not refuse conversion based on any claim that such Holder or anyone associated or affiliated with such Holder has been engaged in any violation of law, agreement or for any other reason, unless an injunction from a court, on notice to Holder, restraining and/or enjoining conversion of all or part of the Preferred Stock of such Holder shall have been sought and obtained, and the Corporation posts a surety bond for the benefit of such Holder in the amount of 150% of the Stated Value of Preferred Stock which is subject to the injunction, which bond shall remain in effect until the completion of arbitration/litigation of the underlying dispute and the proceeds of which shall be payable to such Holder to the extent it obtains judgment. In the absence of such injunction, the Corporation shall issue Conversion Shares and, if applicable,

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cash, upon a properly noticed conversion. If the Corporation fails to deliver to a Holder such Conversion Shares pursuant to Section 6(c)(i) on the Share Delivery Date applicable to such conversion, the Corporation shall pay to such Holder, in cash, as liquidated damages and not as a penalty, for



each \$5,000 of Stated Value of Preferred Stock being converted, \$50 per Trading Day (increasing to \$100 per Trading Day on the third Trading Day and increasing to \$200 per Trading Day on the tenth Trading Day after such damages begin to accrue) for each Trading Day after the Share Delivery Date until such Conversion Shares are delivered or Holder rescinds such conversion. Nothing herein shall limit a Holder's right to pursue actual damages for the Corporation's failure to deliver Conversion Shares within the period specified herein and such Holder shall have the right to pursue all remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief. The exercise of any such rights shall not prohibit a Holder from seeking to enforce damages pursuant to any other Section hereof or under applicable law.

iv) Compensation for Buy-In on Failure to Timely Deliver Conversion Shares Upon Conversion. In addition to any other rights available to the Holder, if the Corporation fails for any reason to deliver to a Holder the applicable Conversion Shares by the Share Delivery Date pursuant to Section 6(c)(i), and if after such Share Delivery Date such Holder is required by its brokerage firm to purchase (in an open market transaction or otherwise), or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by such Holder of the Conversion Shares which such Holder was entitled to receive upon the conversion relating to such Share Delivery Date (a "Buy-In"), then the Corporation shall (A) pay in cash to such Holder (in addition to any other remedies available to or elected by such Holder) the amount, if any, by which (x) such Holder's total purchase price (including any brokerage commissions) for the Common Stock so purchased exceeds (y) the product of (1) the aggregate number of shares of Common Stock that such Holder was entitled to receive from the conversion at issue multiplied by (2) the actual sale price at which the sell order giving rise to such purchase obligation was executed (including any brokerage commissions) and (B) at the option of such Holder, either reissue (if surrendered) the shares of Preferred Stock equal to the number of shares of Preferred Stock submitted for conversion (in which case, such conversion shall be deemed rescinded) or deliver to such Holder the number of shares of Common Stock that would have been issued if the Corporation had timely complied with its delivery requirements under Section 6(c)(i). For example, if a Holder purchases shares of Common Stock having a total purchase price of \$11,000 to cover a Buy-In with respect to an attempted conversion of shares of Preferred Stock with respect to which the actual sale price of the Conversion Shares (including any brokerage commissions) giving rise to such purchase obligation was a total of \$10,000 under clause (A) of the immediately preceding sentence, the Corporation shall be required to pay such Holder \$1,000. The Holder shall provide the Corporation written notice indicating the amounts payable to such Holder in respect of the Buy-In and, upon request of the Corporation, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Corporation's failure to timely deliver Conversion Shares upon conversion of the shares of Preferred Stock as required pursuant to the terms hereof.

v) Reservation of Shares Issuable Upon Conversion. The Corporation covenants that, following the Charter Amendment Date, it will at all times reserve and keep available out of its authorized and unissued shares of Common Stock for the sole purpose of issuance upon conversion of the Preferred Stock as herein provided, free from preemptive rights or any other actual contingent purchase rights of Persons other than the Holder (and the other holders of the Preferred Stock), not less than such aggregate number of shares of the Common Stock as shall be issuable (taking into account the adjustments and restrictions of Section 7) upon the conversion of the then outstanding shares of Preferred Stock. The Corporation covenants that all shares of Common Stock that shall be so issuable shall, upon issue, be duly authorized, validly issued, fully paid and nonassessable.

vi) Fractional Shares. No fractional shares or scrip representing fractional shares shall be issued upon the conversion of the Preferred Stock. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such conversion, the Corporation shall at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Conversion Price or round up to the next whole share.

vii) Transfer Taxes and Expenses. The issuance of Conversion Shares on conversion of this Preferred Stock shall be made without charge to any Holder for any documentary stamp or similar taxes that may be payable in respect of the issue or delivery of such Conversion Shares, provided that the Corporation shall not be required to pay any tax that may be payable in respect of any transfer involved in the issuance and delivery of any such Conversion Shares upon conversion in a name other than that of the Holders of such shares of Preferred Stock and the Corporation shall not be required to issue or deliver such Conversion Shares unless or until the Person or Persons requesting the issuance

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thereof shall have paid to the Corporation the amount of such tax or shall have established to the satisfaction of the Corporation that such tax has been paid. The Corporation shall pay all Transfer Agent fees required for same-day processing of any Notice of Conversion and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Conversion Shares.

d) Beneficial Ownership Limitation. The Corporation shall not effect any conversion of the Preferred Stock, and a Holder shall not have the right to convert any portion of the Preferred Stock, to the extent that, after giving effect to the conversion set forth on the applicable Notice of Conversion, such Holder (together with such Holder's Affiliates, and any Persons acting as a group together with such Holder or any of such Holder's Affiliates (such Persons, "Attribution Parties")) would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by such Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon conversion of the Preferred Stock with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which are issuable upon (i) conversion of the remaining, unconverted Stated Value of Preferred Stock beneficially owned by such Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or unconverted portion of any other securities of the Corporation subject to a limitation on conversion or exercise analogous to the limitation contained herein (including, without limitation, the Preferred Stock or the Warrants) beneficially owned by such Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 6(d), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder, it being acknowledged by the Holder that the Corporation is not representing to the Holder that such calculation is in compliance with Section 13(d) of the Exchange Act and the Holder is solely responsible for any schedules required to be filed in accordance therewith. To the extent that the limitation contained in this Section 6(d) applies, the determination of whether the Preferred Stock is convertible (in relation to other securities owned by such Holder together with any Affiliates and Attribution Parties) and of how many shares of Preferred Stock are convertible shall be in the sole discretion of such Holder, and the submission of a Notice of Conversion shall be deemed to be such Holder's determination of whether the shares of Preferred Stock may be converted (in relation to other securities owned by such Holder together with any Affiliates and Attribution Parties) and how many shares of the Preferred Stock are convertible, in each case subject to the Beneficial Ownership Limitation. To ensure compliance with this restriction, each Holder will be deemed to represent to the Corporation each time it delivers a Notice of Conversion that such Notice of Conversion has not violated the restrictions set forth in this paragraph and the Corporation shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder.

For purposes of this Section 6(d), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as stated in the most recent of the following: (i) the Corporation's most recent periodic or annual report filed with the Commission, as the case may be, (ii) a more recent public announcement by the Corporation or (iii) a more recent written notice by the Corporation or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request (which may be via email) of a Holder, the Corporation shall within one Trading Day confirm orally and in writing to such Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Corporation, including the Preferred Stock, by such Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon conversion of Preferred Stock held by the applicable Holder. A Holder, upon notice to the Corporation, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 6(d) applicable to its Preferred Stock provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon conversion of this Preferred Stock held by the Holder and the provisions of this Section 6(d) shall continue to apply. Any such increase in the Beneficial Ownership Limitation will not be effective until the 61<sup>st</sup> day after such notice is delivered to the Corporation and shall only apply to such Holder and no other Holder. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 6(d) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation contained herein or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of Preferred Stock.

#### Section 7. Certain Adjustments.

a) Stock Dividends and Stock Splits. If the Corporation, at any time while this Preferred Stock is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions payable in shares of Common Stock on shares of Common Stock or any other Common Stock Equivalents (which, for avoidance of doubt, shall not include any shares of

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Common Stock issued by the Corporation upon conversion of, or payment of a dividend on, this Preferred Stock), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of a reverse stock split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues, in the event of a reclassification of shares of the Common Stock, any shares of capital stock of the Corporation, then the Conversion Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding any treasury shares of the Corporation) outstanding immediately before such event, and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event. Any adjustment made pursuant to this Section 7(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 7(a) above, if at any time the Corporation grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder of will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete conversion of such Holder's Preferred Stock (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

c) Pro Rata Distributions. During such time as this Preferred Stock is outstanding, if the Corporation declares or makes any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Preferred Stock, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete conversion of this Preferred Stock (without regard to any limitations on conversion hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall 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 Beneficial Ownership Limitation).

d) Fundamental Transaction. If, at any time while this Preferred Stock is outstanding, (i) the Corporation, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Corporation with or into another Person, (ii) the Corporation, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Corporation or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock, (iv) the Corporation, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Corporation, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with another Person whereby such other Person acquires more than 50% of the outstanding shares of Common Stock (not including any shares of Common Stock held by the other Person or other Persons making or party to, or associated or affiliated with the other Persons making or party to, such stock or share purchase agreement or other business combination) (each a "Fundamental Transaction"), then, upon any subsequent conversion of this Preferred Stock, the Holder shall have the right to receive, for each Conversion Share that would have been issuable upon such conversion immediately prior to the occurrence of

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if it is the surviving corporation, and any additional consideration (the "Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Preferred Stock is convertible immediately prior to such Fundamental Transaction (without regard to any limitation in Section 6(d) on the conversion of this Preferred Stock). For purposes of any such conversion, the determination of the Conversion Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Corporation shall apportion the Conversion Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon any conversion of this Preferred Stock following such Fundamental Transaction. To the extent necessary to effectuate the foregoing provisions, any successor to the Corporation or surviving entity in such Fundamental Transaction shall file a new Certificate of Designation with the same terms and conditions and issue to the Holders new preferred stock consistent with the foregoing provisions and evidencing the Holders' right to convert such preferred stock into Alternate Consideration. The Corporation shall cause any successor entity in a Fundamental Transaction in which the Corporation is not the survivor (the "Successor Entity") to assume in writing all of the obligations of the Corporation under this Certificate of Designation and the other Transaction Documents in accordance with the provisions of this Section 7(d) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the holder of this Preferred Stock, deliver to the Holder in exchange for this Preferred Stock a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Preferred Stock which is convertible for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon conversion of this Preferred Stock (without regard to any limitations on the conversion of this Preferred Stock) prior to such Fundamental Transaction, and with a conversion price which applies the conversion price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such conversion price being for the purpose of protecting the economic value of this Preferred Stock immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Certificate of Designation and the other Transaction Documents referring to the "Corporation" shall refer instead to the Successor Entity), and may exercise every right and power of the Corporation and shall assume all of the obligations of the Corporation under this Certificate of Designation and the other Transaction Documents with the same effect as if such Successor Entity had been named as the Corporation herein.

e) Calculations. All calculations under this Section 7 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 7, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding any treasury shares of the Corporation) issued and outstanding.

f) Notice to the Holders.

i) Adjustment to Conversion Price. Whenever the Conversion Price is adjusted pursuant to any provision of this Section 7, the Corporation shall promptly deliver to each Holder by facsimile or email a notice setting forth the Conversion Price after such adjustment and setting forth a brief statement of the facts requiring such adjustment.

ii) Notice to Allow Conversion by Holder. If (A) the Corporation shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Corporation shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Corporation shall authorize the granting to all holders of the Common Stock of rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Corporation shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Corporation is a party, any sale or transfer of all or substantially all of the assets of the Corporation, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property or (E) the Corporation shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Corporation, then, in each case, the Corporation shall cause to be filed at each office or agency maintained for the purpose of conversion of this Preferred Stock, and shall cause to be delivered by facsimile or email to each Holder at its last facsimile or email address as it shall appear upon the stock books of the Corporation, at least twenty (20) calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the

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Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange, provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Corporation or any of the Subsidiaries, the Corporation shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to convert the Conversion Amount of this Preferred Stock (or any part hereof) during the 20-day period commencing on the date of such notice through the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

Section 8. Miscellaneous.

a) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Conversion, shall be in writing and delivered personally, by facsimile or email, or sent by a nationally recognized overnight courier service, addressed to the Corporation, at the address set forth above Attention: Chief Executive Officer, facsimile number (484) 713-6001, e-mail address:

rkumar@onconova.us, or such other facsimile number, e-mail address or address as the Corporation may specify for such purposes by notice to the Holders delivered in accordance with this Section 8. Any and all notices or other communications or deliveries to be provided by the Corporation hereunder shall be in writing and delivered personally, by facsimile or email, or sent by a nationally recognized overnight courier service addressed to each Holder at the facsimile number, email address or address of such Holder appearing on the books of the Corporation. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number or via email at the email address set forth in this Section prior to 5:30 p.m. (New York City time) on any date, (ii) the next Trading Day after the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number or via email at the email address set forth in this Section on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given.

b) Absolute Obligation. Except as expressly provided herein, no provision of this Certificate of Designation shall alter or impair the obligation of the Corporation, which is absolute and unconditional, to pay liquidated damages and accrued dividends, as applicable, on the shares of Preferred Stock at the time, place, and rate, and in the coin or currency, herein prescribed.

c) Lost or Mutilated Preferred Stock Certificate. If a Holder's Preferred Stock certificate shall be mutilated, lost, stolen or destroyed, the Corporation shall execute and deliver, in exchange and substitution for and upon cancellation of a mutilated certificate, or in lieu of or in substitution for a lost, stolen or destroyed certificate, a new certificate for the shares of Preferred Stock so mutilated, lost, stolen or destroyed, but only upon receipt of evidence of such loss, theft or destruction of such certificate, and of the ownership hereof reasonably satisfactory to the Corporation.

d) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Certificate of Designation shall be governed by and construed and enforced in accordance with the internal laws of the State of Delaware, without regard to the principles of conflict of laws thereof. Each party agrees that all legal proceedings concerning the interpretation, enforcement and defense of the transactions contemplated by any of the Transaction Documents (whether brought against a party hereto or its respective Affiliates, directors, officers, shareholders, employees or agents) shall be commenced in the state and federal courts sitting in the City of New York, Borough of Manhattan (the "New York Courts"). The Corporation and each Holder hereby irrevocably submits to the exclusive jurisdiction of the New York Courts for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein (including with respect to the enforcement of any of the Transaction Documents), and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of such New York Courts, or such New York Courts are improper or inconvenient venue for such proceeding. The Corporation and each Holder hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Certificate of Designation and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by applicable law. The Corporation and each Holder hereby irrevocably

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waives, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Certificate of Designation or the transactions contemplated hereby. If any party shall commence an action or proceeding to enforce any provisions of this Certificate of Designation, then the prevailing party in such action or proceeding shall be reimbursed by the other party for its attorneys' fees and other costs and expenses incurred in the investigation, preparation and prosecution of such action or proceeding.

e) Waiver. Any waiver by the Corporation or a Holder of a breach of any provision of this Certificate of Designation shall not operate as or be construed to be a waiver of any other breach of such provision or of any breach of any other provision of this Certificate of Designation or a waiver by any other Holders. The failure of the Corporation or a Holder to insist upon strict adherence to any term of this Certificate of Designation on one or more occasions shall not be considered a waiver or deprive that party (or any other Holder) of the right thereafter to insist upon strict adherence to that term or any other term of this Certificate of Designation on any other occasion. Any waiver by the Corporation or a Holder must be in writing.

f) Severability. If any provision of this Certificate of Designation is invalid, illegal or unenforceable, the balance of this Certificate of Designation shall remain in effect, and if any provision is inapplicable to any Person or circumstance, it shall nevertheless remain applicable to all other Persons and circumstances. If it shall be found that any interest or other amount deemed interest due hereunder violates the applicable law governing usury, the applicable rate of interest due hereunder shall automatically be lowered to equal the maximum rate of interest permitted under applicable law.

g) Next Business Day. Whenever any payment or other obligation hereunder shall be due on a day other than a Business Day, such payment shall be made on the next succeeding Business Day.

h) Headings. The headings contained herein are for convenience only, do not constitute a part of this Certificate of Designation and shall not be deemed to limit or affect any of the provisions hereof.

i) Status of Converted or Redeemed Preferred Stock. If any shares of Preferred Stock shall be converted, redeemed or reacquired by the Corporation, such shares shall resume the status of authorized but unissued shares of preferred stock and shall no longer be designated as Series B Convertible Preferred Stock.

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RESOLVED, FURTHER, that the Chairman, the president or any vice-president, and the secretary or any assistant secretary, of the Corporation be and they hereby are authorized and directed to prepare and file this Certificate of Designation of Preferences, Rights and Limitations in accordance with the foregoing resolution and the provisions of Delaware law.

IN WITNESS WHEREOF, the undersigned have executed this Certificate this 27th day of April, 2018.

**ANNEX A**

**NOTICE OF CONVERSION**

(TO BE EXECUTED BY THE REGISTERED HOLDER IN ORDER TO CONVERT SHARES OF PREFERRED STOCK)

The undersigned hereby elects to convert the number of shares of Series B Convertible Preferred Stock indicated below into shares of common stock, par value \$0.01 per share (the "Common Stock"), of Onconova Therapeutics, Inc., a Delaware corporation (the "Corporation"), according to the conditions hereof, as of the date written below. If shares of Common Stock are to be issued in the name of a Person other than the undersigned, the undersigned will pay all transfer taxes payable with respect thereto. No fee will be charged to the Holders for any conversion, except for any such transfer taxes.

Conversion calculations:

Date to Effect Conversion:

Number of shares of Preferred Stock owned prior to Conversion:

Number of shares of Preferred Stock to be Converted:

Stated Value of shares of Preferred Stock to be Converted:

Number of shares of Common Stock to be Issued:

Applicable Conversion Price:

Number of shares of Preferred Stock subsequent to Conversion:

Address for Delivery:

or

DWAC Instructions:

Broker no:

Account no:

[HOLDER]

By: \_\_\_\_\_

Name:

Title:

**SERIES B CONVERTIBLE PREFERRED STOCK PURCHASE WARRANT  
ONCONOVA THERAPEUTICS, INC.**

Warrant Shares:

Issue Date:

Initial Exercise Date:

THIS PREFERRED STOCK PURCHASE WARRANT (this “Warrant”) certifies that, for value received, or its assigns (the “Holder”) is entitled, upon the terms and subject to the limitations on exercise and the conditions hereinafter set forth, at any time on or after the date hereof (the “Initial Exercise Date”) and on or prior to 5:00 p.m. (New York City time) on the 18-month anniversary of the date (the “Charter Amendment Date”) on which the Company (as defined below) publicly announces through the filing of a Current Report on Form 8-K that the amendment to the Company’s certificate of incorporation to sufficiently increase the Company’s authorized shares of Common Stock to cover the conversion of all then-outstanding shares of Preferred Stock into Common Stock has been filed with the Secretary of State of the State of Delaware (the “Termination Date”), provided that, if such date is not a Trading Day, the Termination Date should be the immediately following Trading Day but not thereafter, to subscribe for and purchase from Onconova Therapeutics, Inc., a Delaware corporation (the “Company”), up to shares of Preferred Stock (as subject to adjustment hereunder, the “Warrant Shares”). The purchase price of 0.025 of a share of Preferred Stock under this Warrant shall be equal to the Exercise Price, as defined in Section 2(b).

Section 1. Definitions. In addition to the terms defined elsewhere in this Warrant, the following terms have the meanings indicated in this Section 1:

“Affiliate” means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

“Bid Price” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the bid price of the Common Stock for the time in question (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if the Common Stock is then listed on OTCQB or OTCQX and if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported in the “Pink Sheets” published by OTC Markets Group, Inc. (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

“Business Day” means any day except any Saturday, any Sunday, any day which is a federal legal holiday in the United States or any day on which banking institutions in the State of New York are authorized or required by law or other governmental action to close.

“Commission” means the United States Securities and Exchange Commission.

“Common Stock” means the common stock of the Company, par value \$0.01 per share, and any other class of securities into which such securities may hereafter be reclassified or changed.

“Common Stock Equivalents” means any securities of the Company or its subsidiaries which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, right, option, warrant or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

“Exchange Act” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

“Person” means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

“Preferred Stock” means the Series B Convertible Preferred Stock of the Company, par value \$0.01 per share, and any other class of securities into which such securities may hereafter be reclassified or changed.

“Registration Statement” means the Company’s registration statement on Form S-1 (File No. 333-224315).

“Securities Act” means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

“Trading Day” means a day on which the principal Trading Market is open for Trading.

“Trading Market” means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, or the New York Stock Exchange (or any successors to any of the foregoing).

“Transfer Agent” means EQ Shareowner Services, the current transfer agent of the Company, with a mailing address of 1110 Center Point Curve, Suite 101, Mendota Heights, MN 55120 and a facsimile number of (651) 450-4078, and any successor transfer agent of the Company.

“VWAP” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding Trading Day) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if the Common Stock is then listed on OTCQB or OTCQX and if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding Trading Day) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported in the “Pink Sheets” published by OTC Markets Group, Inc. (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value

of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Warrants then outstanding) and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

“Warrants” means this Warrant and other Series B Convertible Preferred Stock purchase warrants issued

by the Company pursuant to the Registration Statement.

## Section 2. Exercise.

a) Exercise of Warrant. Exercise of the purchase rights represented by this Warrant may be made, in whole or in part, at any time or times on or after the Initial Exercise Date and on or before the Termination Date by delivery to the Company of a duly executed facsimile copy or PDF copy submitted by e-mail (or e-mail attachment) of the Notice of Exercise in the form annexed hereto (the “Notice of Exercise”). Within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined in Section 2(d)(i) herein) following the date of exercise as aforesaid, the Holder shall deliver the aggregate Exercise Price for the Warrant Shares specified in the applicable Notice of Exercise by wire transfer or cashier’s check drawn on a United States bank unless the cashless exercise procedure specified in Section 2(c) below is specified in the applicable Notice of Exercise. No ink-original Notice of Exercise shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Exercise be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company until the Holder has purchased all of the Warrant Shares available hereunder and the Warrant has been exercised in full, in which case, the Holder shall surrender this Warrant to the Company for cancellation within three (3) Trading Days of the date on which the final Notice of Exercise is delivered to the Company. Partial exercises of this Warrant resulting in purchases of a portion of the total number of Warrant Shares available hereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable hereunder in an amount equal to the applicable number of Warrant Shares purchased. The Holder and the Company shall maintain records showing the number of Warrant Shares purchased and the date of such purchases. The Company shall deliver any objection to any Notice of Exercise within one (1) Business Day of receipt of such notice. **The Holder and any assignee, by acceptance of this Warrant, acknowledge and agree that, by reason of the provisions of this paragraph, following the purchase of a portion of the Warrant Shares hereunder, the number of Warrant Shares available for purchase hereunder at any given time may be less than the amount stated on the face hereof.**

b) Exercise Price. The exercise price per share of Preferred Stock under this Warrant shall be \$0.425 per 0.025 of a share of Preferred Stock, subject to adjustment hereunder (the “Exercise Price”).

c) Cashless Exercise. If at the time of exercise hereof there is no effective registration statement registering, or the prospectus contained therein is not available for the issuance or resale of the Warrant Shares to or by the Holder, then this Warrant may also be exercised, in whole or in part, at such time by means of a “cashless exercise” in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing [(A-B) (X)] by (A), where:

(A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 2(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 2(a) hereof on a Trading Day prior to the opening of “regular trading hours” (as defined in Rule 600(b)(64) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Stock on the principal Trading Market as reported by Bloomberg L.P. as of the time of the Holder’s execution of the applicable Notice of Exercise if such Notice of Exercise is executed during “regular trading hours” on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of “regular trading hours” on a Trading Day) pursuant to Section 2(a) hereof or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 2(a) hereof after the close of “regular trading hours” on such Trading Day;

(B) = the Exercise Price of this Warrant, as adjusted hereunder; and

(X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the registered characteristics of the Warrants being exercised. The Company agrees not to take any position contrary to this Section 2(c).

Notwithstanding anything herein to the contrary, on the Termination Date, this Warrant shall be automatically exercised via cashless exercise pursuant to this Section 2(c).

d) Mechanics of Exercise.

i. Delivery of Warrant Shares Upon Exercise. The Company shall cause the Warrant Shares purchased hereunder to be transmitted to the Holder by physical delivery of a certificate, registered in the Company’s share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the address specified by the Holder in the Notice of Exercise by the date that is the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period after the delivery to the Company of the Notice of Exercise (such date, the “Warrant Share Delivery Date”). Upon delivery of the Notice of Exercise, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date of delivery of the Warrant Shares, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period following delivery of the Notice of Exercise. The Company agrees to maintain a transfer agent that is a participant in the FAST program so long as this Warrant remains outstanding and exercisable. As used herein, “Standard Settlement Period” means the standard settlement period, expressed in a number of Trading Days, on the Company’s primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Exercise. Notwithstanding the foregoing, commencing on the next business day after the Charter Amendment Date, the Holder shall be entitled to deliver a notice of conversion of the Warrant Shares under the terms of the Preferred Stock and the Certificate of Designation governing the Preferred Stock at such time as such Holder delivers a Notice of Exercise pursuant to Section 2(a) hereunder and such notice of conversion shall be deemed to be delivered on the date of such Notice of Exercise. In the event the Company fails to timely deliver the shares of Common Stock issuable upon conversion of the Warrant Shares under the terms of the Preferred Stock and the Certificate of Designation governing

such Preferred Stock, the provisions covering such failure to timely deliver such shares of Common Stock in the Certificate of Designation governing the terms of such Preferred Stock shall govern the Company's obligations therefor.

ii. Delivery of New Warrants Upon Exercise. If this Warrant shall have been exercised in part, the Company shall, at the request of a Holder and upon surrender of this Warrant certificate, at the time of delivery of the Warrant Shares, deliver to the Holder a new Warrant evidencing the rights of the Holder to purchase the unpurchased Warrant Shares called for by this Warrant, which new Warrant shall in all other respects be identical with this Warrant.

iii. Rescission Rights. If the Company fails to transmit or failed to cause the Transfer Agent to transmit to the Holder the Warrant Shares pursuant to Section 2(d)(i) by the Warrant Share Delivery Date, then the Holder will have the right to rescind such exercise.

iv. Fractional Shares or Script. In the event of fractional shares, the Company shall be obligated to issue shares rounded up to the nearest hundredth of a share of Preferred Stock.

vi. Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the Holder for any issue or transfer tax or other incidental expense in respect of the issuance of Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the Holder or in such name or names as may be directed by the Holder; provided, however, that in the event that Warrant Shares are to be issued in a name other than the name of the Holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto duly executed by the Holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall pay all Transfer Agent fees required for same-day processing of any Notice of Exercise and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Warrant Shares.

vii. Closing of Books. The Company will not close its stockholder books or records in any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

### Section 3. Certain Adjustments.

a) Stock Dividends and Splits. If the Company, at any time while this Warrant is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions on shares of its Preferred Stock or any other equity or equity equivalent securities payable in shares of Preferred Stock (which, for avoidance of doubt, shall not include any shares of Preferred Stock issued by the Company upon exercise of this Warrant), (ii) subdivides outstanding shares of Preferred Stock into a larger number of shares, (iii) combines (including by way of reverse stock split) outstanding shares of Preferred Stock into a smaller number of shares, or (iv) issues by reclassification of shares of the Preferred Stock any shares of capital stock of the Company, then in each case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Preferred Stock (excluding treasury shares, if any), as the case may be, outstanding immediately before such event and of which the denominator shall be the number of shares of Preferred Stock, outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate Exercise Price of this Warrant shall remain unchanged. Any adjustment made pursuant to this Section 3(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) [Reserved]

c) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 3(a) above, if at any time the Company grants, issues or sells any Preferred Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Preferred Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Preferred Stock acquirable upon complete exercise of this Warrant immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Preferred Stock, are to be determined for the grant, issue or sale of such Purchase Rights.

d) Pro Rata Distributions. During such time as this Warrant is outstanding, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Preferred Stock by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Preferred Stock acquirable upon complete exercise of this Warrant immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Preferred Stock are to be determined for the participation in such Distribution.

e) Fundamental Transaction. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, (ii) the Company, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires more than 50% of the outstanding shares of Common Stock (not including any shares of Common Stock held by the other Person or other Persons making or party to, or associated or affiliated with the other Persons making or party to, such stock or share purchase



agreement or other business combination) (each a “Fundamental Transaction”), then, upon any subsequent exercise of this Warrant, the Holder shall have the right to receive, for each share of Common Stock that

would have been issuable upon conversion of the Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction, at the option of the Holder, the number of shares of common stock of the successor or acquiring corporation or of the Company, if it is the surviving corporation, and any additional consideration (the “Alternate Consideration”) receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock issuable upon conversion of the number of Warrant Shares for which this Warrant is exercisable immediately prior to such Fundamental Transaction. For purposes of any such exercise, the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon any exercise of this Warrant following such Fundamental Transaction. The Company shall cause any successor entity in a Fundamental Transaction in which the Company is not the survivor (the “Successor Entity”) to assume in writing all of the obligations of the Company under this Warrant and the other Transaction Documents in accordance with the provisions of this Section 3(e) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the Holder, deliver to the Holder in exchange for this Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant which is exercisable for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon conversion of the Warrant Shares issuable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant, including failure to achieve the Charter Amendment Date) prior to such Fundamental Transaction, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Warrant and the other Transaction Documents referring to the “Company” shall refer instead to the Successor Entity), and may exercise every right and power of the Company and shall assume all of the obligations of the Company under this Warrant and the other Transaction Documents with the same effect as if such Successor Entity had been named as the Company herein.

f) Calculations. All calculations under this Section 3 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 3, the number of shares of Preferred Stock or Common Stock, as the case may be, deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Preferred Stock or Common Stock (excluding treasury shares, if any), as the case may be, issued and outstanding.

g) Notice to Holder.

i. Adjustment to Exercise Price. Whenever the Exercise Price is adjusted pursuant to any provision of this Section 3, the Company shall promptly deliver to the Holder by facsimile or email a notice setting forth the Exercise Price after such adjustment and any resulting adjustment to the number of Warrant Shares and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Exercise by Holder. If (A) the Company shall declare a dividend (or any other distribution in whatever form) on the Preferred Stock or Common Stock, (B) the Company shall declare a special nonrecurring cash dividend on or a redemption of the Preferred Stock or Common Stock, (C) the Company shall authorize the granting to all holders of the Preferred Stock or Common Stock, rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Company shall be required in connection with any reclassification of the Preferred Stock or Common Stock, any consolidation or merger to which the Company is a party, any sale or transfer of all or substantially all of the assets of the Company, or any compulsory share exchange whereby the Preferred Stock, is converted into other securities, cash or property, or (E) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company, then, in each case, the Company shall cause to be delivered by facsimile or email to the Holder at its last facsimile number or email address as it shall appear upon the Warrant Register of the Company, at least 20 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Preferred Stock or Common Stock, to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Preferred Stock or Common Stock, shall be entitled to exchange their shares of Preferred Stock, for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange; provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided in this Warrant constitutes, or contains, material, non-public information regarding the Company or any of its subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to exercise this Warrant during the period commencing on the date of such notice to the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

Section 4. Transfer of Warrant.

a) Transferability. This Warrant and all rights hereunder (including, without limitation, any registration rights) are transferable, in whole or in part, upon surrender of this Warrant at the principal office of the Company or

its designated agent, together with a written assignment of this Warrant substantially in the form attached hereto duly executed by the Holder or its agent or attorney and funds sufficient to pay any transfer taxes payable upon the making of such transfer. Upon such surrender and, if required,

such payment, the Company shall execute and deliver a new Warrant or Warrants in the name of the assignee or assignees, as applicable, and in the denomination or denominations specified in such instrument of assignment, and shall issue to the assignor a new Warrant evidencing the portion of this Warrant not so assigned, and this Warrant shall promptly be cancelled. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company unless the Holder has assigned this Warrant in full, in which case, the Holder shall surrender this Warrant to the Company within three (3) Trading Days of the date on which the Holder delivers an assignment form to the Company assigning this Warrant in full. The Warrant, if properly assigned in accordance herewith, may be exercised by a new holder for the purchase of Warrant Shares without having a new Warrant issued.

b) New Warrants. This Warrant may be divided or combined with other Warrants upon presentation hereof at the aforesaid office of the Company, together with a written notice specifying the names and denominations in which new Warrants are to be issued, signed by the Holder or its agent or attorney. Subject to compliance with Section 4(a), as to any transfer which may be involved in such division or combination, the Company shall execute and deliver a new Warrant or Warrants in exchange for the Warrant or Warrants to be divided or combined in accordance with such notice. All Warrants issued on transfers or exchanges shall be dated the Issue Date of this Warrant and shall be identical with this Warrant except as to the number of Warrant Shares issuable pursuant thereto.

c) Warrant Register. The Company shall register this Warrant, upon records to be maintained by the Company for that purpose (the "Warrant Register"), in the name of the record Holder hereof from time to time. The Company may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

#### Section 5. Miscellaneous.

a) No Rights as Stockholder Until Exercise; No Settlement in Cash. This Warrant does not entitle the Holder to any voting rights, dividends or other rights as a stockholder of the Company prior to the exercise hereof as set forth in Section 2(d)(i), except as expressly set forth in Section 3. Without limiting the rights of a Holder to receive Warrant Shares on a "cashless exercise", in no event will the Company be required to net cash settle a Warrant exercise.

b) Loss, Theft, Destruction or Mutilation of Warrant. The Company covenants that upon receipt by the Company of evidence reasonably satisfactory to it of the loss, theft, destruction or mutilation of this Warrant or any stock certificate relating to the Warrant Shares, and in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to it (which, in the case of the Warrant, shall not include the posting of any bond), and upon surrender and cancellation of such Warrant or stock certificate, if mutilated, the Company will make and deliver a new Warrant or stock certificate of like tenor and dated as of such cancellation, in lieu of such Warrant or stock certificate.

c) Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Business Day, then, such action may be taken or such right may be exercised on the next succeeding Business Day.

d) Authorized Shares.

The Company covenants that during the period the Warrant is outstanding, it will reserve from its authorized and unissued Preferred Stock a sufficient number of shares to provide for the issuance of the Warrant Shares upon the exercise of any purchase rights under this Warrant. The Company further covenants that its issuance of this Warrant shall constitute full authority to its officers who are charged with the duty of issuing the necessary Warrant Shares upon the exercise of the purchase rights under this Warrant. The Company will take all such reasonable action as may be necessary to assure that such Warrant Shares may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of the Trading Market upon which the Common Stock may be listed. The Company covenants that all Warrant Shares which may be issued upon the exercise of the purchase rights represented by this Warrant will, upon exercise of the purchase rights represented by this Warrant and payment for such Warrant Shares in accordance herewith, be duly authorized, validly issued, fully paid and nonassessable and free from all taxes, liens and charges created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue).

Except and to the extent as waived or consented to by the Holder, the Company shall not by any action, including, without limitation, amending its certificate of incorporation, as amended, including the Certificate of Designation governing the rights of the Preferred Stock, or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such actions as may be necessary or appropriate to protect the rights of Holder as set forth in this Warrant against impairment. Without limiting the generality of the foregoing, the Company will (i) not increase the par value of any Warrant Shares above the amount payable therefor upon such exercise immediately prior to such increase in par value, (ii) take all such action as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable Warrant Shares upon the exercise of this Warrant and (iii) use commercially reasonable efforts to obtain all such authorizations, exemptions or consents from any public regulatory body having jurisdiction thereof, as may be, necessary to enable the Company to perform its obligations under this Warrant.

Before taking any action which would result in an adjustment in the number of Warrant Shares for which this Warrant is exercisable or in the Exercise Price, the Company shall obtain all such authorizations or exemptions thereof, or consents thereto, as may be necessary from any public regulatory body or bodies having jurisdiction thereof.

e) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party agrees that all legal proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Warrant (whether brought against a party hereto or their respective affiliates, directors, officers, shareholders, partners, members, employees or agents) shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City

of New York, Borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is improper or is an inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Warrant and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law. If either party shall commence an action, suit or proceeding to enforce any provisions of this Warrant, the prevailing party in such action, suit or proceeding shall be reimbursed by the other party for their reasonable attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such action or proceeding.

f) Restrictions. The Holder acknowledges that the Warrant Shares acquired upon the exercise of this Warrant, if not registered, and the Holder does not utilize cashless exercise, will have restrictions upon resale imposed by state and federal securities laws.

g) Nonwaiver and Expenses. No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise prejudice the Holder's rights, powers or remedies, notwithstanding the fact that the Holder's right to exercise this Warrant terminates on the Termination Date. If the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

h) Notices. Any notices, consents, waivers or other document or communications required or permitted to be given or delivered under the terms of this Warrant, including, without limitation, any Notice of Exercise, must be in writing and will be deemed to have been delivered: (i) upon receipt, if delivered personally; (ii) when sent, if sent by facsimile (provided confirmation of transmission is mechanically or electronically generated and kept on file by the sending party); (iii) when sent, if sent by e-mail (provided that such sent e-mail is kept on file (whether electronically or otherwise) by the sending party and the sending party does not receive an automatically generated message from the recipient's e-mail server that such e-mail could not be delivered to such recipient) and (iv) if sent by overnight courier service, one (1) Trading Day after deposit with an overnight courier service with next day delivery specified, in each case, properly addressed to the party to receive the same. The addresses, facsimile numbers and e-mail addresses for such communications shall be:

If to the Company:  
Onconova Therapeutics, Inc.  
375 Pheasant Run, Newtown, PA 18954  
Facsimile: (267) 759-3681  
E-mail: MGuerin@onconova.us  
Attention: Mark Guerin, Chief Financial Officer

If to a Holder, to its address, facsimile number or e-mail address set forth herein or on the books and records of the Company..

i) Limitation of Liability. No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for the purchase price of any Common Stock or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

j) Remedies. The Holder, in addition to being entitled to exercise all rights granted by law, including recovery of damages, will be entitled to specific performance of its rights under this Warrant. The Company agrees that monetary damages would not be adequate compensation for any loss incurred by reason of a breach by it of the provisions of this Warrant and hereby agrees to waive and not to assert the defense in any action for specific performance that a remedy at law would be adequate.

k) Successors and Assigns. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

l) Amendment. This Warrant may be modified or amended or the provisions hereof waived with the written consent of the Company and the Holder.

m) Severability. Wherever possible, each provision of this Warrant shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Warrant shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Warrant.

n) Headings. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant.

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*(Signature Page Follows)*

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IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

ONCONOVA THERAPEUTICS, INC.

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

**NOTICE OF EXERCISE**

TO: ONCONOVA THERAPEUTICS, INC.

(1) The undersigned hereby elects to purchase \_\_\_\_\_ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.

(2) Payment shall take the form of (check applicable box):

in lawful money of the United States; or

[if permitted] the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 2(c), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 2(c).

(3) Please issue a certificate or certificates representing said Warrant Shares in the name of the undersigned or in such other name as is specified below:

\_\_\_\_\_

The Warrant Shares shall be delivered to the following DWAC Account Number or by physical delivery of a certificate to:

[SIGNATURE OF HOLDER]

Name of Investing Entity: \_\_\_\_\_

Signature of Authorized Signatory of Investing Entity: \_\_\_\_\_

Name of Authorized Signatory: \_\_\_\_\_

Title of Authorized Signatory: \_\_\_\_\_

Date: \_\_\_\_\_

**ASSIGNMENT FORM**

*(To assign the foregoing warrant, execute this form and supply required information. Do not use this form to exercise the warrant.)*

FOR VALUE RECEIVED, [ ] all of or [ ] shares of the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: \_\_\_\_\_

(Please Print)

Address: \_\_\_\_\_

(Please Print)

Phone Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

Dated: ,

Holder's Signature: \_\_\_\_\_

Holder's Address: \_\_\_\_\_

**PRE-FUNDED COMMON STOCK PURCHASE WARRANT  
ONCONOVA THERAPEUTICS, INC.**

Warrant Shares:

Issue Date: , 2018

THIS PRE-FUNDED COMMON STOCK PURCHASE WARRANT (the "Warrant") certifies that, for value received, or its assigns (the "Holder") is entitled, upon the terms and subject to the limitations on exercise and the conditions hereinafter set forth, at any time on or after the date hereof (the "Initial Exercise Date") until this Warrant is exercised in full (the "Termination Date"), but not thereafter, to subscribe for and purchase from Onconova Therapeutics, Inc., a Delaware corporation (the "Company"), up to shares (as subject to adjustment hereunder, the "Warrant Shares") of Common Stock. The purchase price of one share of Common Stock under this Warrant shall be equal to the Exercise Price, as defined in Section 2(b).

Section 1. Definitions. In addition to the terms defined elsewhere in this Warrant, the following terms have the meanings indicated in this Section 1:

"Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

"Business Day" means any day except any Saturday, any Sunday, any day which is a federal legal holiday in the United States or any day on which banking institutions in the State of New York are authorized or required by law or other governmental action to close.

"Commission" means the United States Securities and Exchange Commission.

"Common Stock" means the common stock of the Company, par value \$0.01 per share, and any other class of securities into which such securities may hereafter be reclassified or changed.

"Common Stock Equivalents" means any securities of the Company or its subsidiaries which would entitle the holder thereof to acquire at any time shares of Common Stock, including, without limitation, any debt, preferred stock, right, option, warrant or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, shares of Common Stock.

"Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

"Person" means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

"Trading Day" means a day on which the principal Trading Market is open for Trading.

"Trading Market" means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market or the New York Stock Exchange (or any successors to any of the foregoing).

"Transfer Agent" means EQ Shareowner Services, the current transfer agent of the Company, with a mailing address of 1110 Center Point Curve, Suite 101, Mendota Heights, MN 55120 and a facsimile number of (651) 450-4078, and any successor transfer agent of the Company.

"Underwriting Agreement" means that certain underwriting agreement entered into by and between H.C. Wainwright & Co., LLC and the Company, dated as of April 27, 2018.

Section 2. Exercise.

(a) Exercise of Warrant. Exercise of the purchase rights represented by this Warrant may be made, in whole or in part, at any time or times on or after the Initial Exercise Date and on or before the Termination Date by delivery to the Company of a duly executed facsimile copy or PDF copy submitted by e-mail (or e-mail attachment) of the Notice of Exercise in the form annexed hereto (the "Notice of Exercise"). Within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined in Section 2(d)(i) herein) following the date of exercise as aforesaid, the Holder shall deliver the aggregate Exercise Price for the Warrant Shares specified in the applicable Notice of Exercise by wire transfer or cashier's check drawn on a United States bank unless the cashless exercise procedure specified in Section 2(c) below is specified in the applicable Notice of Exercise. No ink-original Notice of Exercise shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Exercise be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company until the Holder has purchased all of the Warrant Shares available hereunder and the Warrant has been exercised in full, in which case, the Holder shall surrender this Warrant to the Company for cancellation within three (3) Trading Days of the date on which the final Notice of Exercise is delivered to the Company. Partial exercises of this Warrant resulting in purchases of a portion of the total number of Warrant Shares available hereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable hereunder in an amount equal to the applicable number of Warrant Shares purchased. The Holder and the Company shall maintain records showing the number of Warrant Shares purchased and the date of such purchases. The Company shall deliver any objection to any Notice of Exercise within one (1) Business Day of receipt of such notice. **The Holder and any assignee, by acceptance of this Warrant, acknowledge and agree that, by reason of the provisions of this paragraph, following the purchase of a portion of the Warrant Shares hereunder, the number of Warrant Shares available for purchase hereunder at any given time may be less than the amount stated on the face hereof.**

(b) Exercise Price. The aggregate exercise price of this Warrant, except for a nominal exercise price of \$0.01 per Warrant Share, was pre-funded to the Company on or prior to the Initial

Exercise Date and, consequently, no additional consideration (other than the nominal exercise price of \$0.01 per Warrant Share) shall be required to be paid by the Holder to any Person to effect any exercise of this Warrant. The Holder shall not be entitled to the return or refund of all, or any portion, of such pre-paid aggregate exercise price under any circumstance or for any reason whatsoever, including in the event this Warrant shall not have been exercised prior to the Termination Date. The exercise price per Warrant Share under this Warrant shall be \$0.425, subject to adjustment hereunder. The remaining unpaid exercise price per Warrant Share shall be \$0.01, subject to adjustment hereunder (the "Exercise Price").

(c) Cashless Exercise. If at the time of exercise hereof there is no effective registration statement registering, or the prospectus contained therein is not available for the issuance or resale of the Warrant Shares to or by the Holder, then this Warrant may also be exercised, in whole or in part, at such time by means of a "cashless exercise" in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing  $[(A-B) (X)]$  by (A), where:

- (A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 2(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 2(a) hereof on a Trading Day prior to the opening of "regular trading hours" (as defined in Rule 600(b)(64) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Stock on the principal Trading Market as reported by Bloomberg L.P. as of the time of the Holder's execution of the applicable Notice of Exercise if such Notice of Exercise is executed during "regular trading hours" on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of "regular trading hours" on a Trading Day) pursuant to Section 2(a) hereof or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 2(a) hereof after the close of "regular trading hours" on such Trading Day;
- (B) = the Exercise Price of this Warrant, as adjusted hereunder; and
- (X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the registered characteristics of the Warrants being exercised. The Company agrees not to take any position contrary to this Section 2(c).

"Bid Price" means, for any date, the price determined by the first of the following clauses that

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applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the bid price of the Common Stock for the time in question (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if the Common Stock is then listed on OTCQB or OTCQX and OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported in the "Pink Sheets" published by OTC Markets Group, Inc. (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

"VWAP" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding Trading Day) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding Trading Day) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported in the "Pink Sheets" published by OTC Markets Group, Inc. (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

Notwithstanding anything herein to the contrary, subject to the limitations set forth in Section 2(e), on the Termination Date, this Warrant shall be automatically exercised via cashless exercise pursuant to this Section 2(c) if the applicable VWAP is greater than the Exercise Price of this Warrant, as adjusted hereunder.

Without limiting the rights of a Holder to receive Warrant Shares on a "cashless exercise" and without limiting the liquidated damages provision in Section 2(d)(i) and the buy-in provision in Section 2(d)(iv), in no event will the Company be required to net cash settle a Warrant exercise.

(d) Mechanics of Exercise.

(i) Delivery of Warrant Shares Upon Exercise. The Company shall cause the Warrant Shares purchased hereunder to be transmitted by the Transfer Agent to the Holder by crediting the account of the Holder's or its designee's balance account with The Depository Trust Company through its Deposit or Withdrawal at Custodian system ("DWAC") if the Company is then a participant in such system and either (A) there is an effective registration statement permitting the issuance of the Warrant Shares to or resale of the Warrant Shares by the Holder or

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(B) this Warrant is being exercised via cashless exercise, and otherwise by physical delivery of a certificate, registered in the Company's share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the address specified by the Holder in the Notice of Exercise by the date that is the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period after the delivery to the Company of the Notice of Exercise (such date, the "Warrant Share Delivery Date"). Upon delivery of the Notice of Exercise, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date of delivery of the Warrant Shares, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period following delivery of the Notice of Exercise or the Holder has properly elected to effect a cashless exercise of this Warrant in accordance with Section 2(c). If the Company fails to deliver to the Holder the Warrant Shares subject to a Notice of Exercise by the Warrant Share Delivery Date, the Company shall pay to the Holder, in cash, as liquidated damages and not as a penalty, for each \$1,000 of Warrant Shares subject to such exercise (based on the VWAP of the Common Stock on the date of the applicable Notice of Exercise), \$10 per Trading Day (increasing to \$20 per Trading Day on the fifth Trading Day after such liquidated damages begin to accrue) for each Trading Day after such Warrant Share Delivery Date until such Warrant Shares are delivered or Holder rescinds such exercise. The Company agrees to maintain a transfer agent that is a participant in the FAST program so long as this Warrant remains outstanding and exercisable. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Company's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Exercise. Notwithstanding the foregoing, with respect to any Notice(s) of Exercise delivered on or prior to 12:00 p.m. (New York City time) on the Initial Exercise Date, which may be delivered at any time after the time of execution of the Underwriting Agreement, the Company agrees to deliver the Warrant Shares subject to such notice(s) by 4:00 p.m. (New York City time) on the Initial Exercise Date.

(ii) Delivery of New Warrants Upon Exercise. If this Warrant shall have been exercised in part, the Company shall, at the request of a Holder and upon surrender of this Warrant certificate, at the time of delivery of the Warrant Shares, deliver to the Holder a new Warrant evidencing the rights of the Holder to purchase the unpurchased Warrant Shares called for by this Warrant, which new Warrant shall in all other respects be identical with this Warrant.

(iii) Rescission Rights. If the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares pursuant to Section 2(d)(i) by the Warrant Share Delivery Date, then the Holder will have the right to rescind such exercise.

(iv) Compensation for Buy-In on Failure to Timely Deliver Warrant Shares Upon Exercise. In addition to any other rights available to the Holder, if the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares in accordance with the provisions of Section 2(d)(i) above pursuant to an exercise on or before the Warrant Share Delivery Date, and if after such date the Holder is required by its broker to purchase (in an open market transaction or otherwise) or the Holder's brokerage firm otherwise purchases, shares of Common Stock to

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deliver in satisfaction of a sale by the Holder of the Warrant Shares which the Holder anticipated receiving upon such exercise (a "Buy-In"), then the Company shall (A) pay in cash to the Holder the amount, if any, by which (x) the Holder's total purchase price (including brokerage commissions, if any) for the shares of Common Stock so purchased exceeds (y) the amount obtained by multiplying (1) the number of Warrant Shares that the Company was required to deliver to the Holder in connection with the exercise at issue times (2) the price at which the sell order giving rise to such purchase obligation was executed, and (B) at the option of the Holder, either reinstate the portion of the Warrant and equivalent number of Warrant Shares for which such exercise was not honored (in which case such exercise shall be deemed rescinded) or deliver to the Holder the number of shares of Common Stock that would have been issued had the Company timely complied with its exercise and delivery obligations hereunder. For example, if the Holder purchases Common Stock having a total purchase price of \$11,000 to cover a Buy-In with respect to an attempted exercise of shares of Common Stock with an aggregate sale price giving rise to such purchase obligation of \$10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder \$1,000. The Holder shall provide the Company written notice indicating the amounts payable to the Holder in respect of the Buy-In and, upon request of the Company, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other equitable remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver shares of Common Stock upon exercise of the Warrant as required pursuant to the terms hereof.

(v) No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such exercise, the Company shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Exercise Price or round up to the next whole share.

(vi) Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the Holder for any issue or transfer tax or other incidental expense in respect of the issuance of Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the Holder or in such name or names as may be directed by the Holder; provided, however, that in the event that Warrant Shares are to be issued in a name other than the name of the Holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto duly executed by the Holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall pay all Transfer Agent fees required for same-day processing of any Notice of Exercise and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Warrant Shares.

(vii) Closing of Books. The Company will not close its stockholder books or records in any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

(e) Holder's Exercise Limitations. The Company shall not effect any exercise of this Warrant, and a Holder shall not have the right to exercise any portion of this Warrant, pursuant to

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Section 2 or otherwise, to the extent that after giving effect to such issuance after exercise as set forth on the applicable Notice of Exercise, the Holder (together with the Holder's Affiliates, and any other Persons acting as a group together with the Holder or any of the Holder's Affiliates (such Persons, "Attribution Parties")), would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (i) exercise of the remaining, nonexercised portion of this Warrant beneficially owned by the Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other Common Stock Equivalents) subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 2(e), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder, it being acknowledged by the Holder that the Company is not representing to the Holder that such calculation is in compliance with Section 13(d) of the Exchange Act and the Holder is solely responsible for any schedules required to be filed in accordance therewith. To the extent that the limitation contained in this Section 2(e) applies, the determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable shall be in the sole discretion of the Holder, and the submission of a Notice of Exercise shall be deemed to be the Holder's determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable, in each case subject to the Beneficial Ownership Limitation, and the Company shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 2(e), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as reflected in (A) the Company's most recent periodic or annual report filed with the Commission, as the case may be, (B) a more recent public announcement by the Company or (C) a more recent written notice by the Company or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Company shall within one Trading Day confirm orally and in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be [4.99%/9.99%] of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon exercise of this Warrant. The Holder, upon notice to the Company, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 2(e), provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon exercise of this Warrant held by the Holder and the provisions of this Section 2(e) shall continue to apply. Any increase in the Beneficial Ownership Limitation will not be effective until the 61<sup>st</sup> day after such notice is delivered to the Company. The provisions of this

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paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 2(e) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation herein contained or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Warrant. If the Warrant is unexercisable as a result of the holder's Beneficial Ownership Limitation, no alternate consideration is owing to the Holder.

### Section 3. Certain Adjustments.

(a) Stock Dividends and Splits. If the Company, at any time while this Warrant is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions on shares of its Common Stock or any other equity or equity equivalent securities payable in shares of Common Stock (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Company upon exercise of this Warrant), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of reverse stock split) outstanding shares of Common Stock into a smaller number of shares or (iv) issues by reclassification of shares of the Common Stock any shares of capital stock of the Company, then in each case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding treasury shares, if any) outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate Exercise Price of this Warrant shall remain unchanged, subject to the limitation on fractional shares in Section 2(d)(v). Any adjustment made pursuant to this Section 3(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

(b) [Reserved]

(c) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 3(a) above, if at any time the Company grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, that, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto

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would not result in the Holder exceeding the Beneficial Ownership Limitation).



(d) Pro Rata Distributions. During such time as this Warrant is outstanding, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) other than a dividend or other distribution of the type described in Section 3(a) above (a “Distribution”), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, that, to the extent that the Holder’s right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall 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 Beneficial Ownership Limitation).

(e) Fundamental Transaction. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, (ii) the Company, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires more than 50% of the outstanding shares of Common Stock (not including any shares of Common Stock held by the other Person or other Persons making or party to, or associated or affiliated with the other Persons making or party to, such stock or share purchase agreement or other business combination) (each a “Fundamental Transaction”), then, upon any subsequent exercise of this Warrant, the Holder shall have the right to receive, for each Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction, at the option of the Holder (without regard to any limitation in Section 2(e) on the exercise of this Warrant), the number of shares of common stock of the successor or acquiring corporation or of the Company, if it is the surviving corporation, and any additional consideration (the “Alternate Consideration”) receivable as a result of such Fundamental Transaction by

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a holder of the number of Shares of Common Stock for which this Warrant is exercisable immediately prior to such Fundamental Transaction (without regard to any limitation in Section 2(e) on the exercise of this Warrant). For purposes of any such exercise, the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon any exercise of this Warrant following such Fundamental Transaction. The Company shall cause any successor entity in a Fundamental Transaction in which the Company is not the survivor (the “Successor Entity”) to assume in writing all of the obligations of the Company under this Warrant and the other Transaction Documents in accordance with the provisions of this Section 3(e) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the Holder, deliver to the Holder in exchange for this Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant which is exercisable for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Warrant and the other Transaction Documents referring to the “Company” shall refer instead to the Successor Entity), and may exercise every right and power of the Company and shall assume all of the obligations of the Company under this Warrant and the other Transaction Documents with the same effect as if such Successor Entity had been named as the Company herein.

(f) Calculations. All calculations under this Section 3 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 3, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding treasury shares, if any) issued and outstanding.

(g) Notice to Holder.

(i) Adjustment to Exercise Price. Whenever the Exercise Price is adjusted pursuant to any provision of this Section 3, the Company shall promptly deliver to the Holder by facsimile number or email a notice setting forth the Exercise Price after such adjustment and any resulting adjustment to the number of Warrant Shares and setting forth a brief statement of the facts requiring such adjustment.

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(ii) Notice to Allow Exercise by Holder. If (A) the Company shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Company shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Company shall authorize the granting to all holders of the Common Stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Company shall be required in connection with any reclassification of the Common

Stock, any consolidation or merger to which the Company is a party, any sale or transfer of all or substantially all of the assets of the Company, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property, or (E) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company, then, in each case, the Company shall cause to be delivered by facsimile or email to the Holder at its last facsimile or email address as it shall appear upon the Warrant Register of the Company, at least 20 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange; provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided in this Warrant constitutes, or contains, material, non-public information regarding the Company or any of its subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to exercise this Warrant during the period commencing on the date of such notice to the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

#### Section 4. Transfer of Warrant.

(a) Transferability. This Warrant and all rights hereunder are transferable, in whole or in part, upon surrender of this Warrant at the principal office of the Company or its designated agent, together with a written assignment of this Warrant substantially in the form attached hereto duly executed by the Holder or its agent or attorney and funds sufficient to pay any transfer taxes payable upon the making of such transfer. Upon such surrender and, if required, such payment, the Company shall execute and deliver a new Warrant or Warrants in the name of the assignee or assignees, as applicable, and in the denomination or denominations specified in such instrument of assignment, and shall issue to the assignor a new Warrant evidencing the portion of this Warrant not so assigned, and this Warrant shall promptly be cancelled. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company unless the Holder has assigned this Warrant in full, in which case, the Holder shall surrender this Warrant to the Company within three (3) Trading Days of the date the Holder delivers an assignment form to the Company assigning this Warrant in full. The Warrant, if properly assigned in accordance herewith, may be exercised by a new holder for the purchase of Warrant Shares without having a new Warrant issued.

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(b) New Warrants. This Warrant may be divided or combined with other Warrants upon presentation hereof at the aforesaid office of the Company, together with a written notice specifying the names and denominations in which new Warrants are to be issued, signed by the Holder or its agent or attorney. Subject to compliance with Section 4(a), as to any transfer which may be involved in such division or combination, the Company shall execute and deliver a new Warrant or Warrants in exchange for the Warrant or Warrants to be divided or combined in accordance with such notice. All Warrants issued on transfers or exchanges shall be dated the original Issue Date and shall be identical with this Warrant except as to the number of Warrant Shares issuable pursuant thereto.

(c) Warrant Register. The Company shall register this Warrant, upon records to be maintained by the Company for that purpose (the "Warrant Register"), in the name of the record Holder hereof from time to time. The Company may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

#### Section 5. Miscellaneous.

(a) No Rights as Stockholder Until Exercise. This Warrant does not entitle the Holder to any voting rights, dividends or other rights as a stockholder of the Company prior to the exercise hereof as set forth in Section 2(d)(i), except as expressly set forth in Section 3.

(b) Loss, Theft, Destruction or Mutilation of Warrant. The Company covenants that upon receipt by the Company of evidence reasonably satisfactory to it of the loss, theft, destruction or mutilation of this Warrant or any stock certificate relating to the Warrant Shares, and in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to it (which, in the case of the Warrant, shall not include the posting of any bond), and upon surrender and cancellation of such Warrant or stock certificate, if mutilated, the Company will make and deliver a new Warrant or stock certificate of like tenor and dated as of such cancellation, in lieu of such Warrant or stock certificate.

(c) Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Business Day, then, such action may be taken or such right may be exercised on the next succeeding Business Day.

(d) Authorized Shares.

The Company covenants that, during the period the Warrant is outstanding, it will reserve from its authorized and unissued Common Stock a sufficient number of shares to provide for the issuance of the Warrant Shares upon the exercise of any purchase rights under this Warrant. The Company further covenants that its issuance of this Warrant shall constitute full authority to its officers who are charged with the duty of issuing the necessary Warrant Shares upon the exercise of the purchase rights under this Warrant. The Company will take all such reasonable action as may be necessary to assure that such Warrant Shares may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of the Trading Market upon which the Common Stock may be listed. The Company covenants that all Warrant Shares which may be issued upon the exercise of the purchase rights represented by this Warrant will, upon exercise of the purchase rights represented by this

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Warrant and payment for such Warrant Shares in accordance herewith, be duly authorized, validly issued, fully paid and nonassessable and free from all taxes, liens and charges created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue).

Except and to the extent as waived or consented to by the Holder, the Company shall not by any action, including, without limitation, amending its certificate of incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such actions as may be necessary or appropriate to protect the rights of Holder as set forth in this Warrant against impairment. Without limiting the generality of the foregoing, the Company will (i) not increase the par value of any Warrant Shares above the amount payable therefor upon such exercise immediately prior to such increase in par value, (ii) take all such action as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable Warrant Shares upon the exercise of this Warrant and (iii) use commercially reasonable efforts to obtain all such authorizations, exemptions or consents from any public regulatory body having jurisdiction thereof, as may be, necessary to enable the Company to perform its obligations under this Warrant.

Before taking any action which would result in an adjustment in the number of Warrant Shares for which this Warrant is exercisable or in the Exercise Price, the Company shall obtain all such authorizations or exemptions thereof, or consents thereto, as may be necessary from any public regulatory body or bodies having jurisdiction thereof.

(e) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party agrees that all legal proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Warrant (whether brought against a party hereto or their respective affiliates, directors, officers, shareholders, partners, members, employees or agents) shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is improper or is an inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Warrant and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law. If either party shall commence an action, suit or proceeding to enforce any provisions of this Warrant, the prevailing party in such action, suit or proceeding shall be reimbursed by the other party for their reasonable attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such action or proceeding.

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(f) Restrictions. The Holder acknowledges that the Warrant Shares acquired upon the exercise of this Warrant, if not registered and the Holder does not utilize cashless exercise, will have restrictions upon resale imposed by state and federal securities laws.

(g) Nonwaiver and Expenses. No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise prejudice the Holder's rights, powers or remedies, notwithstanding the fact that the Holder's right to exercise this Warrant terminates on the Termination Date. If the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

(h) Notices.

a) Notices. Any notices, consents, waivers or other document or communications required or permitted to be given or delivered under the terms of this Warrant, including, without limitation, any Notice of Exercise, must be in writing and will be deemed to have been delivered: (i) upon receipt, if delivered personally; (ii) when sent, if sent by facsimile (provided confirmation of transmission is mechanically or electronically generated and kept on file by the sending party); (iii) when sent, if sent by e-mail (provided that such sent e-mail is kept on file (whether electronically or otherwise) by the sending party and the sending party does not receive an automatically generated message from the recipient's e-mail server that such e-mail could not be delivered to such recipient) and (iv) if sent by overnight courier service, one (1) Trading Day after deposit with an overnight courier service with next day delivery specified, in each case, properly addressed to the party to receive the same. The addresses, facsimile numbers and e-mail addresses for such communications shall be:

If to the Company:

Onconova Therapeutics, Inc.  
375 Pheasant Run, Newtown, PA 18954  
Facsimile: (267) 759-3681  
E-mail: MGuerin@onconova.us  
Attention: Mark Guerin, Chief Financial Officer

If to a Holder, to its address, facsimile number or e-mail address set forth herein or on the books and records of the Company.

(i) Limitation of Liability. No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for the purchase price of any Common Stock or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

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(j) Remedies. The Holder, in addition to being entitled to exercise all rights granted by law, including recovery of damages, will be entitled to specific performance of its rights under this Warrant. The Company agrees that monetary damages would not be adequate compensation for any loss incurred by reason of a breach by it of the provisions of this Warrant and hereby agrees to waive and not to assert the defense in any action for specific performance that a remedy at law would be adequate.

(k) Successors and Assigns. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

(l) Amendment. This Warrant may be modified or amended or the provisions hereof waived with the written consent of the Company and the Holder.

(m) Severability. Wherever possible, each provision of this Warrant shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Warrant shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Warrant.

(n) Headings. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant.

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(Signature Page Follows)

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IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

**ONCONOVA THERAPEUTICS, INC.**

By: \_\_\_\_\_  
Name:  
Title:

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**NOTICE OF EXERCISE**

TO: ONCONOVA THERAPEUTICS, INC.

(1) The undersigned hereby elects to purchase \_\_\_\_\_ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.

(2) Payment shall take the form of (check applicable box):

in lawful money of the United States; or

[if permitted] the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 2(c), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 2(c).

(3) Please issue a certificate or certificates representing said Warrant Shares in the name of the undersigned or in such other name as is specified below:

\_\_\_\_\_

The Warrant Shares shall be delivered to the following DWAC Account Number or by physical delivery of a certificate to:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

[SIGNATURE OF HOLDER]

Name of Investing Entity: \_\_\_\_\_  
Signature of Authorized Signatory of Investing Entity: \_\_\_\_\_  
Name of Authorized Signatory: \_\_\_\_\_  
Title of Authorized Signatory: \_\_\_\_\_  
Date: \_\_\_\_\_

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**ASSIGNMENT FORM**

(To assign the foregoing warrant, execute this form and supply required information. Do not use this form to exercise the warrant.)

FOR VALUE RECEIVED, [ ] all of or [ ] shares of the foregoing Warrant and all rights evidenced thereby are hereby assigned to  
whose address is

Dated: ,

Holder's Signature: \_\_\_\_\_

Holder's Address: \_\_\_\_\_  
\_\_\_\_\_

Signature Guaranteed: \_\_\_\_\_

NOTE: The signature to this Assignment Form must correspond with the name as it appears on the face of the Warrant, without alteration or enlargement or any change whatsoever, and must be guaranteed by a bank or trust company. Officers of corporations and those acting in a fiduciary or other representative capacity should file proper evidence of authority to assign the foregoing Warrant.

**LOCK-UP WAIVER AGREEMENT**

This **LOCK-UP WAIVER AGREEMENT** (this "Waiver Agreement") is made as of April 16, 2018, by and among Onconova Therapeutics, Inc. (the "Company"), H.C. Wainwright & Co., LLC (the "Underwriter") and each of the warrant holders identified on the signature pages hereto (collectively, the "Warrant holders"). Capitalized terms used herein without definition shall have the respective meanings assigned to such terms in the Underwriting Agreement referred to below.

**WHEREAS**, pursuant to Section 5(j) of the Underwriting Agreement dated as of February 8, 2018 (the "Underwriting Agreement"), by and between the Company and the Underwriter, the Company agreed to certain restrictions (the "Company Lock-Up"), under which during a period of one hundred and thirty-five (135) days from the date of the Prospectus, the Company will not, without the prior written consent of the Underwriter, (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend or otherwise transfer or dispose of, directly or indirectly, or announce the issuance or proposed issuance of, any Common Stock or any securities convertible into or exercisable or exchangeable for Common Stock or (ii) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of Common Stock, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Common Stock or such other securities, in cash or otherwise, subject to certain exceptions;

**WHEREAS**, to regain compliance with continuing listing requirements of the Nasdaq Capital Market and to raise funds, the Company proposes to register Company equity securities (the "Securities") on a registration statement on Form S-1 and to offer and sell the Securities (the "Offering");

**WHEREAS**, the Underwriter consulted with the Warrant holders and informed the Company that its waiver of the Company Lock-Up with respect to the Offering shall be conditioned upon the Company's agreement to reprice the warrants held by all of the Warrant holders and all other warrants of the same class or series issued pursuant to the Underwriting Agreement (the "Warrants" and all holders of the Warrants, "Holders"); and

**WHEREAS**, the Company is willing to agree to such repricing of the Warrants, subject to the conditions set forth herein.

**NOW, THEREFORE**, in consideration of the foregoing, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereby agree as follows:

1. **Waiver of Company Lock-Up.** Effective as of the date hereof, the Underwriter hereby waives the Company Lock-Up solely with respect to the Offering (the "Waiver"). Except as expressly waived hereby, Section 5(j) of the Underwriting Agreement shall remain in full force and effect. The Warrant holders acknowledge the Waiver.
2. **Repricing of the Warrants.** The Company acknowledges and agrees to reduce the exercise price of the Warrants such that the exercise price of the Warrants shall be equal to 105% of the public offering price of Common Stock sold in the Offering (but only to the extent that such public offering price is lower than the current exercise price of the Warrants) and that such repricing shall be effective concurrently with the closing of the Offering (the "Repricing"). The Company hereby represents and

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warrants that prior to the date hereof, as of the date hereof, and covenants and agrees from and after the date hereof, that none of the terms offered to any Holder with respect to any adjustment, amendment or modification of the Warrants (including the Repricing) (each an "Other Agreement"), is or will be more favorable to such other Holders than the Repricing. If, and whenever on or after the date hereof, the Company enters into an Other Agreement and the terms and conditions of such Other Agreement are more favorable to the other Holders than the Repricing, then without any further action by the Warrant holders or the Company, this Waiver Agreement shall automatically be amended and modified in an economically and legally equivalent manner such that the Warrant holders hereunder shall receive the benefit of the more favorable terms and/or conditions (as the case may be) set forth in such Other Agreement. The provisions of this paragraph shall apply similarly and equally to each Other Agreement.

3. **Governing Law.** THIS WAIVER AGREEMENT SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK, WITHOUT REGARD TO SUCH STATE'S PRINCIPLES OF CONFLICTS OF LAWS.

4. **Counterparts.** This Waiver Agreement may be executed in any number of counterparts and by different parties hereto on separate counterparts, each of which when so executed and delivered shall be an original, but all of which counterparts taken together shall be deemed to constitute one and the same instrument. Delivery of an executed counterpart of a signature page of this Waiver Agreement by telecopy or any other electronic means that reproduces an image of the actual executed signature page shall be effective as delivery of a manually executed counterpart of this Waiver Agreement.

[Signature Pages Follow]

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**IN WITNESS WHEREOF**, each of the undersigned has duly executed this Waiver Agreement as of the date first set forth above.

ONCONOVA THERAPEUTICS, INC.

By: \_\_\_\_\_  
Name:  
Title:

H.C. WAINWRIGHT & CO., LLC

By: \_\_\_\_\_

Name: \_\_\_\_\_  
Title: \_\_\_\_\_

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[NAME OF WARRANTHOLDER]

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

*[Signature Page to Lock-Up Waiver Agreement]*

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## Onconova Therapeutics Announces Pricing of \$25.0 Million Upsized Underwritten Public Offering

**NEWTOWN, PA, April 27, 2018 (Globe Newswire)**—Onconova Therapeutics, Inc. (NASDAQ:ONTX) (“Onconova” or “we”), a Phase 3 stage biopharmaceutical company focused on discovering and developing small molecule drug candidates to treat cancer, with a primary focus on Myelodysplastic Syndromes (MDS), today announced the pricing of an underwritten public offering (the “Offering”) of 58,823,529 shares of its common stock (“Common Stock”) (or Common Stock equivalent) and warrants to purchase up to an aggregate of 1,470,588.225 shares of Onconova’s Series B convertible preferred stock (“Preferred Stock Warrants”) at a public offering price of \$0.425 per share and accompanying Preferred Stock Warrant. The gross proceeds of the Offering are expected to be approximately \$25.0 million, or approximately \$28.75 million if the underwriter exercises its option to purchase additional securities in full, prior to deducting underwriting discounts and commissions and estimated offering expenses. In addition, in the event the underwriter exercises its option to purchase additional securities in full and the Preferred Stock Warrants are exercised in full, Onconova expects to receive approximately \$28.75 million in additional proceeds. However, there is no assurance that all or a portion of the Preferred Stock Warrants will be exercised prior to their expiration. This Offering is expected to close on or about May 1, 2018, subject to customary closing conditions.

H.C. Wainwright & Co. is acting as the sole book-running manager for the Offering.

Onconova has granted the underwriter a 30-day option to purchase up to 8,823,529 additional shares of Common Stock and/or Preferred Stock Warrants to purchase up to an aggregate of 220,588.225 shares of Series B Preferred Stock, at the public offering price, less underwriting discounts and commissions.

The Preferred Stock Warrants will be exercisable immediately at an exercise price of \$0.425 per 0.025 share of Series B Preferred Stock (convertible into one share of Common Stock) and will expire on the 18-month anniversary of the date on which we publicly announce through the filing of a Current Report on Form 8-K that an amendment to the Company’s certificate of incorporation to increase the Company’s authorized shares of Common Stock has been filed with the Secretary of State of the State of Delaware. The shares of Common Stock (or Common Stock equivalent) and the accompanying Preferred Stock Warrants can only be purchased together in this Offering but will be issued separately.

Onconova intends to use the net proceeds from this Offering to fund the development of its clinical and preclinical programs, for other research and development activities and for general corporate purposes, which may include capital expenditures and funding working capital needs.

A registration statement on Form S-1 (File No. 333-224315) relating to these securities was declared effective by the U.S. Securities and Exchange Commission (SEC) on April 26, 2018. This Offering is being made only by means of a prospectus forming part of the effective registration statement. A preliminary prospectus relating to and describing the terms of the Offering has been filed with the SEC. Copies of the preliminary prospectus and, when available, copies of the final prospectus relating to the Offering may be obtained for free by visiting the SEC’s website at [www.sec.gov](http://www.sec.gov) or by contacting H.C. Wainwright & Co., LLC, 430 Park Avenue, 3rd Floor, New York, New York 10022, by email at [placements@hcwco.com](mailto:placements@hcwco.com) or by telephone at 646-975-6996.

This press release shall not constitute an offer to sell or a solicitation of an offer to buy these securities, nor shall there be any sale of these securities in any state or other jurisdiction in which such offer, solicitation or sale would be unlawful prior to the registration or qualification under the securities laws of any such state or other jurisdiction.

### About Onconova Therapeutics, Inc.

Onconova Therapeutics, Inc. is a Phase 3-stage biopharmaceutical company focused on discovering and developing novel small molecule drug candidates to treat cancer, with a primary focus on Myelodysplastic Syndromes (MDS). Rigosertib, Onconova’s lead candidate, is a proprietary Phase 3 small molecule agent, which we believe blocks cellular signaling by targeting RAS effector pathways. Using a proprietary chemistry platform, Onconova has created a pipeline of targeted agents designed to work against specific cellular pathways that are important in cancer cells. Onconova has three product candidates in the clinical stage and several pre-clinical programs. Advanced

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clinical trials with Onconova’s lead compound, rigosertib, are aimed at what Onconova believes are unmet medical needs of patients with MDS. For more information, please visit <http://www.onconova.com>.

### Forward-Looking Statements

Some of the statements in this release are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, Section 21E of the Securities Exchange Act of 1934, as amended, and the Private Securities Litigation Reform Act of 1995, which involve risks and uncertainties, including the use of proceeds from the Offering. These statements relate to future events and include, without limitation, Onconova’s expectation regarding the Offering and the exercise of the Preferred Stock Warrants. Although Onconova believes that the expectations reflected in such forward-looking statements are reasonable as of the date made, expectations may prove to have been materially different from the results expressed or implied by such forward-looking statements. Onconova has attempted to identify forward-looking statements by terminology including “believes,” “estimates,” “anticipates,” “expects,” “plans,” “intends,” “may,” “could,” “might,” “will,” “should,” “approximately” or other words that convey uncertainty of future events or outcomes. These statements are only predictions and involve known and unknown risks, uncertainties, and other factors, including Onconova’s need for additional financing and current plans and future needs to scale back operations if adequate financing is not obtained, the success and timing of Onconova’s clinical trials and regulatory approval of protocols, market conditions and those discussed under the heading “Risk Factors” in Onconova’s registration statement on Form S-1, as amended (File No. 333-224315) and the most recent Annual Report on Form 10-K.

Any forward-looking statements contained in this release speak only as of its date. Onconova undertakes no obligation to update any forward-looking statements contained in this release to reflect events or circumstances occurring after its date or to reflect the occurrence of unanticipated events.

### GENERAL CONTACT:

<http://www.onconova.com/contact/>

### INVESTOR RELATIONS CONTACT:



