

**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 20, 2017**

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 8.01. Other Events.

On April 20, 2017, Onconova Therapeutics, Inc. (the "Company") entered into an underwriting agreement (the "Underwriting Agreement") with Laidlaw & Company (UK) Ltd. as representative of the several underwriters named in Schedule A thereto (the "Underwriters"), with respect to the issuance and sale in an underwritten public offering (the "Offering") by the Company of 2,476,190 shares of the Company's common stock, \$0.01 par value per share (the "Shares"), at a price to the public of \$2.10 per Share. Pursuant to the Underwriting Agreement, the Company granted the Underwriters a 45-day option to purchase up to an additional 363,580 Shares. The Underwriting Agreement contains customary representations, warranties and agreements by the Company, customary conditions to closing, indemnification obligations of the Company and the Underwriters, including for liabilities under the Securities Act of 1933, as amended (the "Securities Act"), other obligations of the parties and termination provisions.

The representations, warranties and covenants contained in the Underwriting Agreement were made only for purposes of such agreement and as of specific dates, were solely for the benefit of the parties to such agreement, and may be subject to limitations agreed upon by the contracting parties. The foregoing description of the Underwriting Agreement does not purport to be complete and is qualified in its entirety by reference to the full text of the Underwriting Agreement, which is filed as Exhibit 1.1 hereto and is incorporated herein by reference. A copy of the opinion of Morgan, Lewis & Bockius LLP relating to the legality of the issuance and sale of the Shares is attached as Exhibit 5.1 hereto.

The net proceeds to the Company, before expenses, from the sale of the 2,476,190 Shares in the Offering are approximately \$4,846,399. The Company expects to use the net proceeds of the 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.

The Offering is expected to close on April 26, 2017, subject to the satisfaction of customary closing conditions, and the Shares are registered under the Securities Act pursuant to a shelf registration on Form S-3 (Registration No. 333-199219).

On April 21, 2017, the Company issued a press release announcing the pricing of the Offering. A copy of the press release is attached as Exhibit 99.1 hereto.

Item 9.01. Financial Statements and Exhibits.

(d) Exhibits

<u>Exhibit No.</u>	<u>Exhibit</u>
1.1	Underwriting Agreement, dated as of April 20, 2017
5.1	Opinion of Morgan, Lewis & Bockius LLP
23.1	Consent of Morgan, Lewis & Bockius LLP (included in Exhibit 5.1)
99.1	Press release dated April 21, 2017

2

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 24, 2017

Onconova Therapeutics, Inc.

By: /s/ Mark Guerin

Name: Mark Guerin

Title: Chief Financial Officer

3

EXHIBIT INDEX

<u>Exhibit No.</u>	<u>Description</u>
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4

2,476,190 Shares

ONCONOVA THERAPEUTICS, INC.

Common Stock

UNDERWRITING AGREEMENT

April 20, 2017

LAIDLAW & COMPANY (UK) LTD.

546 Fifth Avenue, 5th Floor

New York, NY 10036

As Representative of the Several Underwriters named on Schedule A annexed hereto

Ladies and Gentlemen:

1. *Introductory.* ONCONOVA THERAPEUTICS, INC., a Delaware corporation (the “**Company**”), agrees with Laidlaw & Company (UK) Ltd. (the “**Representative**”) and the several Underwriters named in Schedule A hereto (the “**Underwriters**”) to issue and sell to the several Underwriters 2,476,190 shares (the “**Firm Securities**”) of its common stock, par value \$0.01 per share (the “**Common Stock**”), and also proposes to issue and sell to the Underwriters, at the option of the Underwriters, an aggregate of not more than 363,580 additional shares (the “**Optional Securities**”) of its Securities as set forth below. The Firm Securities and the Optional Securities are herein collectively called the “**Offered Securities**”. To the extent there are no additional underwriters listed on Schedule A, the term “Representative” as used herein shall mean you, as Underwriters, and the term “Underwriters” shall mean either the singular or the plural, as the context requires.

2. *Representations and Warranties of the Company.* The Company represents and warrants to, and agrees with, the several Underwriters that:

(a) *Filing and Effectiveness of Registration Statement; Certain Defined Terms.* The Company has filed with the Commission a registration statement on Form S-3 thereto (No. 333-199219), including a related prospectus or prospectuses, covering the registration of the Offered Securities under the Securities Act (as defined below), which has become effective. No stop order suspending the effectiveness of the Registration Statement, any post-effective amendment thereto, if any, or use of the Statutory Prospectus (as defined below) has been issued by the Commission and no proceeding for that purpose or pursuant to Section 8A of the Securities Act has been initiated or, to the Company’s knowledge, threatened by the Commission. “**Registration Statement**” at any particular time means such registration statement in the form then filed with the Commission, including any amendment thereto or any registration statement, if any, increasing the size of the offering filed pursuant to Rule 462(b) under the Securities Act and the Rules and Regulations, and any document incorporated by reference therein and all 430B Information and all 430C Information with respect to such registration statement, that in any case has not been superseded or modified. “**Registration Statement**” without reference to a time means the Registration Statement as of the Effective Time. For purposes of this definition, 430B Information shall be considered to be included in the Registration Statement as of the time specified in Rule 430B.

For purposes of this underwriting agreement (this “**Agreement**”):

1

“**430B Information**” means information included in a prospectus then deemed to be a part of the Registration Statement pursuant to Rule 430B(e) or retroactively deemed to be a part of the Registration Statement pursuant to Rule 430B(f).

“**430C Information**” means information included in a prospectus then deemed to be a part of the Registration Statement pursuant to Rule 430C.

“**Applicable Time**” means 8:00 p.m. (Eastern time) on April 20, 2017.

“**Closing Date**” has the meaning defined in Section 3 hereof.

“**Commission**” means the U.S. Securities and Exchange Commission.

“**Effective Time**” of the Registration Statement relating to the Offered Securities means the time of the first contract of sale for the Offered Securities.

“**Exchange Act**” means the Securities Exchange Act of 1934, as amended.

“**Final Prospectus**” means the Statutory Prospectus that discloses the public offering price, other 430B Information and other final terms of the Offered Securities and otherwise satisfies Section 10(a) of the Securities Act.

“**General Use Issuer Free Writing Prospectus**” means any Issuer Free Writing Prospectus that is intended for general distribution to prospective investors, as evidenced by its being so specified in Schedule B to this Agreement.

“**Issuer Free Writing Prospectus**” means any “issuer free writing prospectus,” as defined in Rule 433, relating to the Offered Securities in the form filed or required to be filed with the Commission or, if not required to be filed, in the form retained in the Company’s records pursuant to Rule 433(g).

“**Limited Use Issuer Free Writing Prospectus**” means any Issuer Free Writing Prospectus that is not a General Use Issuer Free Writing Prospectus.

“**Rules and Regulations**” means the rules and regulations of the Commission promulgated under the Securities Act and Exchange Act.

“**Securities Act**” means the Securities Act of 1933, as amended.

“**Securities Laws**” means, collectively, the Sarbanes-Oxley Act of 2002 (“**Sarbanes-Oxley**”), the Securities Act, the Exchange Act, the Rules and Regulations, the auditing principles, rules, standards and practices applicable to auditors of “issuers” (as defined in Sarbanes-Oxley) promulgated or approved by the Public Company Accounting Oversight Board and, as applicable, the rules of The NASDAQ Stock Market (“**Exchange Rules**”).

“**Statutory Prospectus**” with reference to any particular time means the prospectus relating to the Offered Securities that is included in the Registration Statement immediately prior to that time, including all 430B Information and all 430C Information with respect to the Registration Statement. For purposes of the foregoing definition, 430B Information shall be considered to be included in the Statutory Prospectus only as of the actual time that form of prospectus (including a prospectus supplement) is filed with the Commission pursuant to Rule 424(b) and not retroactively.

2

Unless otherwise specified, a reference to a “rule” is to the indicated rule under the Securities Act.

(b) *Compliance with Securities Act Requirements.* (i) (A) At the time the Registration Statement initially became effective, (B) at the time of each amendment thereto for the purposes of complying with Section 10(a)(3) of the Securities Act (whether by post-effective amendment, incorporated report or form of prospectus), (C) at the Effective Time relating to the Offered Securities and (D) on the Closing Date, the Registration Statement conformed and will conform in all material respects to the requirements of the Securities Act and the Rules and Regulations and did not and will not include any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein not misleading and (ii) (A) on its date, (B) at the time of filing the Final Prospectus pursuant to Rule 424(b) and (C) on the Closing Date, the Final Prospectus will conform in all material respects to the requirements of the Securities Act and the Rules and Regulations, and will not include any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein not misleading. The preceding sentence does not apply to statements in or omissions from any such document based upon written information furnished to the Company by any Underwriter through the Representative specifically for use therein, it being understood and agreed that the only such information is that described as such in Section 8(b) hereof.

(c) *Intentionally Deleted.*

(d) *Ineligible Issuer Status.* (i) At the earliest time after the filing of the Registration Statement that the Company or another offering participant made a *bona fide* offer (within the meaning of Rule 164(h)(2)) of the Firm Securities and (ii) at the date of this Agreement, the Company was not and is not an “**ineligible issuer**,” as defined in Rule 405, including (x) the Company or any other subsidiary in the preceding three years not having been convicted of a felony or misdemeanor or having been made the subject of a judicial or administrative decree or order as described in Rule 405 and (y) the Company in the preceding three years not having been the subject of a bankruptcy petition or insolvency or similar proceeding, not having had a registration statement be the subject of a proceeding under Section 8 of the Securities Act and not being the subject of a proceeding under Section 8A of the Securities Act in connection with the offering of the Firm Securities, all as described in Rule 405.

(e) *General Disclosure Package.* As of the Applicable Time, neither (i) the General Use Issuer Free Writing Prospectus(es) issued at or prior to the Applicable Time and, the preliminary prospectus supplement, dated April 20, 2017, including the base prospectus, dated October 8, 2014 (which is the most recent Statutory Prospectus distributed to investors generally), and the other information, if any, stated in Schedule B to this Agreement to be included in the General Disclosure Package, all considered together (collectively, the “**General Disclosure Package**”), nor (ii) any individual Limited Use Issuer Free Writing Prospectus, when considered together with the General Disclosure Package, included any untrue statement of a material fact or omitted to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading. The documents incorporated by reference in the Registration Statement, the Statutory Prospectus and the General Disclosure Package, when they became effective or were filed with the Commission, as the case may be, conformed in all material respects to the requirements of the Securities Act or the Exchange Act, as applicable, and the Rules and Regulations and none of such documents contained any untrue statement of a material fact or omitted to state any material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading; and any further documents so filed and incorporated by reference in the Registration Statement, the Statutory Prospectus and the General Disclosure Package, when such documents are filed with Commission, will conform in all material respects to the requirements of

3

the Securities Act or the Exchange Act, as applicable, and the Rules and Regulations and will not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading. At the respective time the Registration Statement became effective, at the date of this Agreement and at each Closing Date, the Registration Statement and any amendments thereto conformed and will conform in all material respects to the requirements of the Securities Act and the Rules and Regulations and did not and will not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein not misleading; and the Statutory Prospectus and any amendments or supplements thereto, at the time the Statutory Prospectus or any amendment or supplement thereto was issued and at each Closing Date, conformed and will conform in all material respects to the requirements of the Securities Act and 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 necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading. The preceding sentence does not apply to statements in or omissions from any Statutory Prospectus or any Issuer Free Writing Prospectus in reliance upon and in conformity with written information furnished to the Company by any Underwriter through the Representative specifically for use therein, it being understood and agreed that the only such information furnished by any Underwriter consists of the information described as such in Section 8(b) hereof.

(f) *Issuer Free Writing Prospectuses.* Each Issuer Free Writing Prospectus, as of its issue date and at all subsequent times through the completion of the public offer and sale of the Offered Securities or until any earlier date that the Company notified or notifies the Representative as described in the next sentence, did not, does not and will not include any information that conflicted, conflicts or will conflict with the information then contained in the Registration Statement or contain any untrue statement of 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. If at any time following issuance of an Issuer Free Writing Prospectus there occurred or occurs an event or development as a result of which such Issuer Free Writing Prospectus conflicted or would conflict with the information then contained in the Registration Statement or as a result of which such Issuer Free Writing Prospectus, if republished immediately following such event or development, 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 under which they were made, not misleading, (i) the Company has promptly notified or will promptly notify the Representative and (ii) the Company has promptly amended or will promptly amend or supplement such Issuer Free Writing Prospectus to eliminate or correct such conflict, untrue statement or omission.

(g) *Form S-3.* The Company and the transactions contemplated by this Agreement meet the requirements for, and comply with the conditions for the use of, Form S-3 under the Securities Act and the Rules and Regulations. The Company is subject to and in compliance in all material respects with the reporting requirements of Section 13 or Section 15(d) of the Exchange Act. General Instruction I.B.6. of Form S-3 is applicable to the proposed offering of the Offered Securities. The Company is not a shell company (as defined in Rule 405 of the Securities Act) and has not been a shell company for at least 12 calendar months previously and if it has been a shell company at any time previously, has filed current Form 10 information (as defined in Instruction I.B.6 of Form S-3) with the Commission at least 12 calendar months previously reflecting its status as an entity that is not a shell company.

(h) *Good standing of the Company and Subsidiaries.* Each of the Company and each Subsidiary (as defined below) has been duly organized and is validly existing as a corporation in good standing (or the foreign equivalent thereof) under the laws of its jurisdiction of organization. Each of the Company and each Subsidiary is duly qualified to do business and is

4

in good standing as a foreign corporation in each jurisdiction in which its ownership or lease of property or the conduct of its business requires such qualification and has all corporate power and authority necessary to own or hold its properties and to conduct the business in which it is engaged, except where the failure to so qualify or have such corporate power or authority (i) would not have, singularly or in the aggregate, a material adverse effect on the condition (financial or otherwise), results of operations, assets or business or prospects of the Company or any Subsidiary, taken as a whole, or (ii) impair in any material respect the ability of the Company to perform its obligations under this Agreement or to consummate any transactions contemplated by this Agreement, the General Disclosure Package or the Prospectus (any such effect as described in clauses (i) or (ii), a “**Material Adverse Effect**”). The Company does not own or control, directly or indirectly any corporations, partnerships, limited liability partnerships, limited liability companies, associations or other entities. In the event that the Company has only no subsidiaries or only one subsidiary, then all references herein to “**Subsidiary**” or “**Subsidiaries**” of the Company shall be deemed to refer to no subsidiary or such single subsidiary, *mutatis mutandis*.

(i) *Offered Securities.* The Offered Securities and all other outstanding shares of capital stock of the Company have been duly authorized; the authorized equity capitalization of the Company is as set forth in the General Disclosure Package and the Final Prospectus; all outstanding shares of capital stock of the Company are, and, when the Offered Securities have been delivered and paid for in accordance with this Agreement on each Closing Date, such Offered Securities will have been, validly issued, fully paid and non-assessable, will conform in all material respects to the information in the General Disclosure Package and to the description of such Offered Securities contained in the Final Prospectus; the stockholders of the Company have no preemptive rights with respect to the Offered Securities; and none of the outstanding shares of capital stock of the Company have been issued in violation of any preemptive or similar rights of any security holder. All the outstanding shares of capital stock of the Subsidiaries have been duly authorized and validly issued, are fully paid and non-assessable and, except to the extent set forth in the General Disclosure Package and the Final Prospectus, are owned by the Company directly or indirectly through one or more wholly-owned subsidiaries, free and clear of any claim, lien, encumbrance, security interest, restriction upon voting or transfer or any other claim of any third party.

(j) *No Finder’s Fee.* Except as disclosed in the General Disclosure Package and the Final Prospectus, there are no contracts, agreements or understandings between the Company and any person that would give rise to a valid claim against the Company or any Underwriter for a brokerage commission, finder’s fee or other like payment in connection with this offering.

(k) *Registration Rights.* Except as disclosed in the General Disclosure Package and the Final Prospectus, there are no contracts, agreements or understandings between the Company and any person granting such person the right to require the Company to file a registration statement under the Securities Act with respect to any securities of the Company owned or to be owned by such person or to require the Company to include such securities in the securities registered pursuant to a Registration Statement or in any securities being registered pursuant to any other registration statement filed by the Company under the Securities Act (collectively, “**registration rights**”).

(l) *Listing.* The Company is in compliance with all applicable corporate governance requirements set forth in the Nasdaq Marketplace Rules that are then in effect and is actively taking steps to ensure that it will be in compliance with other applicable corporate governance requirements set forth in the Nasdaq Marketplace Rules not currently in effect upon and all times after the effectiveness of such requirements. The Common Stock is registered pursuant to Section 12(b) of the Exchange Act and except as described in the General Disclosure Package, the Company has taken no action designed to, or reasonably likely to have the effect of, terminating the registration of the Common Stock under the Exchange Act or delisting the

5

Common Stock from The NASDAQ Capital Market (“**NASDAQ CM**”), nor has the Company received any notification that the Commission or NASDAQ CM is contemplating terminating such registration or listing.

(m) *Audit Opinion.* Ernst & Young LLP, which has provided an audit opinion concerning the Company’s financial statements and schedules, if any, for the periods set forth in the General Disclosure Package and the Final Prospectus in such report and included or incorporated by

reference in the Registration Statement, the General Disclosure Package and the Final Prospectus, has audited the Company's financial statements for the years ended December 31, 2016 and 2017 is an independent registered public accounting firm as required by the Securities Act and the Rules and Regulations and the Public Company Accounting Oversight Board (United States). Except as disclosed in the General Disclosure Package and the Final Prospectus and as pre-approved in accordance with the requirements set forth in Section 10A of the Exchange Act, Ernst & Young LLP has not been engaged by the Company to perform any "**prohibited activities**" (as defined in Section 10A of the Exchange Act).

(n) *Minutes and Consents.* The minutes or consents of the board of directors and stockholders of the Company for the last two fiscal years have been made available to the Underwriters and counsel for the Underwriters, and such minutes or consents accurately reflect in all material respects all transactions referred to in such minutes.

(o) *Compliance with Laws.* The Company is in compliance with all applicable federal, state, local and foreign laws, regulations, orders and decrees governing its business as currently conducted, except where noncompliance would not, singularly or in the aggregate, have a Material Adverse Effect. This Section does not relate to matters with respect to taxes, which are the subject of Sections 2(kk) and (ll), employee benefits, which are the subject of Section 2(mm), environmental matters, which are the subject of Section 2(x), or FDA (as defined below) matters, which are the subject of Section 2(ss).

(p) *Absence of Further Requirements.* Except for the registration of the Offered Securities under the Securities Act and such consents, approvals, authorizations, registrations or qualifications as may be required under the Exchange Act and applicable state or foreign securities laws, the Financial Industry Regulatory Authority ("**FINRA**") and NASDAQ CM in connection with the issuance and sale of the Offered Securities by the Company, no consent, approval, authorization or order of, or filing, qualification or registration with, any court or governmental agency or body, foreign or domestic, which has not been made, obtained or taken and is not in full force and effect, is required for the execution, delivery and performance of this Agreement by the Company, the offer or sale of the Offered Securities or the consummation of the transactions contemplated hereby.

(q) *Title to Property.* The Company and the Subsidiaries do not own any real property. Each of the Company and each Subsidiary has good title, or has valid rights to lease or otherwise use all items of personal property owned by them which are material to the business of the Company and each such Subsidiary in each case free and clear of all liens, encumbrances, security interests, claims and defects except those that (i) are described in the General Disclosure Package and the Final Prospectus, or (ii) do not, singularly or in the aggregate, materially affect the value of such property and do not materially interfere with the use made and proposed to be made of such property by the Company or the Subsidiaries; and all of the leases and subleases material to the business of the Company and the Subsidiaries, and under which the Company or each Subsidiary holds properties described in the General Disclosure Package and the Final Prospectus, are in full force and effect, and, except as described in the General Disclosure Package and the Final Prospectus, the Company has not received any written notice of any material claim of any sort that has been asserted by anyone adverse to the rights of the Company or the Subsidiaries under any of the leases or subleases mentioned above, or affecting or questioning the

rights of the Company or the Subsidiary to the continued possession of the leased or subleased premises under any such lease or sublease.

(r) *Absence of Defaults and Conflicts Resulting from Transaction.* The execution, delivery and performance of this Agreement by the Company, the issue and sale of the Offered Securities by the Company and the consummation of the transactions contemplated hereby will not (with or without notice or lapse of time or both) conflict with or result in a breach or violation of (i) any of the terms or provisions of, constitute a default under, give rise to any right of termination or other right or the cancellation or acceleration of any right or obligation or loss of a benefit under, or give rise to the creation or imposition of any lien, encumbrance, security interest, claim or charge upon any property or assets of the Company or any Subsidiary pursuant to, any indenture, mortgage, deed of trust, loan agreement or other agreement or instrument to which the Company or any Subsidiary is a party or by which the Company or any Subsidiary is bound or to which any of the property or assets of the Company or any Subsidiary is subject, (ii) the provisions of the charter or by-laws of the Company or any Subsidiary, or (iii) any law, statute, rule, regulation, judgment, order or decree of any court or governmental agency or body, domestic or foreign, having jurisdiction over the Company or any Subsidiary or any of their properties or assets, except in the case of each of the foregoing clauses of this paragraph, for such breaches, violations or defaults that would not singularly or in the aggregate have a Material Adverse Effect.

(s) *Absence of Existing Defaults and Conflicts.* Except as disclosed in the General Disclosure Package and the Final Prospectus, neither the Company nor any Subsidiary is in violation of its respective charter or by-laws or in default (or with the giving of notice or lapse of time would be in default) under any existing material obligation, agreement, covenant or condition contained in any indenture, loan agreement, mortgage, lease or other agreement or instrument to which any of them is a party or by which any of them is bound or to which any of the properties of any of them is subject, except such defaults that would not, singularly or in the aggregate, have a Material Adverse Effect.

(t) *Authorization of Agreement.* The Company has the full right, power and authority to enter into this Agreement, and to perform and to discharge its obligations hereunder; and this Agreement has been duly authorized, executed and delivered by the Company, and constitutes the valid and binding obligations of the Company enforceable in accordance with their respective terms, subject to applicable bankruptcy, insolvency, reorganization or similar laws affecting generally the enforcement of creditors' rights and the relief of debtors. All corporate action required to be taken for the authorization, issuance and sale of the Offered Securities has been duly and validly taken.

(u) *Possession of Licenses and Permits.* Each of the Company and each Subsidiary possesses all licenses, certificates, authorizations and permits issued by, the appropriate local, state, federal or foreign regulatory agencies or bodies which are necessary for the ownership of its properties or the conduct of its businesses as described in the General Disclosure Package and the Final Prospectus (collectively, the "**Governmental Permits**") except where any failure to possess the same, singularly or in the aggregate, would not have a Material Adverse Effect. Each of the Company and each Subsidiary is in material compliance with all material Governmental Permits; all such Governmental Permits are valid and in full force and effect, except where the validity or failure to be in full force and effect would not, singularly or in the aggregate, have a Material Adverse Effect. Neither the Company nor any Subsidiary has received any written notification of any revocation or modification (or proceedings related thereto) of any such Governmental Permit and the Company has no reason to believe that any such material Governmental Permit will not be renewed. This Section does not relate to matters with respect to taxes, which are the subject of Sections 2(kk) and (ll), employee benefits, which are the subject of Section 2(mm), environmental

matters, which are the subject of Section 2(x), or FDA matters, which are the subject of Section 2(ss).

(v) *Absence of Labor Dispute.* No labor disturbance by the employees of the Company or any Subsidiary exists or, to the best of the Company's knowledge, is imminent, and the Company has no knowledge of any existing or imminent labor disturbance by the employees of any of its or its Subsidiaries' principal suppliers, manufacturers, customers or contractors, that could reasonably be expected, singularly or in the aggregate, to have a Material Adverse Effect. The Company has no knowledge that any key employee or significant group of employees of the Company or any Subsidiary plans to terminate employment with the Company or any Subsidiary.

(w) *Intellectual Property.* The Company and the Subsidiaries have, or have rights to use, all patents, patent applications, trademarks, trademark applications, service marks, trade names, trade secrets, inventions, copyrights, licenses and other intellectual property rights and similar rights necessary or required for use in connection with their respective businesses as described in the Registration Statement, the General Disclosure Package and the Final Prospectus and which the failure to so have would have a Material Adverse Effect (collectively, the "**Intellectual Property Rights**"). None of, and neither the Company nor any Subsidiary has received a notice (written or otherwise) that any of, the Intellectual Property Rights has expired, terminated or been abandoned, or is expected to expire or terminate or be abandoned, within two (2) years from the date of this Agreement. Neither the Company nor any Subsidiary has received, since the date of the latest audited financial statements included or incorporated in Registration Statement, the General Disclosure Package and the Final Prospectus, a written notice of a claim or otherwise has any knowledge that the Intellectual Property Rights violate or infringe upon the rights of any Person, except as would not have or reasonably be expected to not have a Material Adverse Effect. To the knowledge of the Company, all such Intellectual Property Rights are enforceable and there is no existing infringement by another Person of any of the Intellectual Property Rights. The Company and its Subsidiaries have taken reasonable security measures to protect the secrecy, confidentiality and value of all of their intellectual properties, except where failure to do so would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect.

(x) *Environmental Laws.* The Company and its Subsidiaries (a) are in material compliance with any and all applicable federal, state, local and foreign laws, rules, regulations, decisions and orders relating to the protection of human health and safety, the environment or hazardous or toxic substances or wastes, pollutants or contaminants (collectively, "**Environmental Laws**"); (b) have received and are in compliance with all permits, licenses or other approvals required of it under applicable Environmental Laws to conduct its business; and (c) have not received notice of any actual or potential liability for the investigation or remediation of any disposal or release of hazardous or toxic substances or wastes, pollutants or contaminants regulated under any Environmental Laws, except in each case as would not, singularly or in the aggregate, have a Material Adverse Effect.

(y) *Accurate Disclosure.* The statements in the General Disclosure Package and the Final Prospectus under the headings "Description of Capital Stock" and "Prospectus Supplement Summary," insofar as such statements summarize legal matters, agreements, documents or proceedings discussed therein, are accurate and fair summaries in all material respects of such legal matters, agreements, documents or proceedings.

(z) *No Integration.* Neither the Company, nor any of its affiliates, nor any person acting on its or their behalf has, directly or indirectly, made any offers or sales of any security or solicited any offers to buy any security, under circumstances that would cause the Offered Securities to be integrated with prior offerings by the Company for purposes of the Securities Act which would require the registration of any such securities under the Securities Act.

(aa) *Forward-Looking Statements.* No forward-looking statement (within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act) contained in either the General Disclosure Package or the Final Prospectus has been made or reaffirmed without a reasonable basis or has been disclosed other than in good faith.

(bb) *FINRA.* Neither the Company nor any Subsidiary nor any of their affiliates (within the meaning of FINRA's Rule 5121(f)(1)) directly or indirectly controls, is controlled by, or is under common control with, or is an associated person of a member (within the meaning of Article I, Section (rr) of the By-laws of FINRA) of, any member firm of FINRA.

(cc) *Absence of Manipulation.* The Company has not taken, directly or indirectly, any action that is designed to or that has constituted or that would reasonably be expected to cause or result in the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of the Offered Securities.

(dd) *Statistical and Market-Related Data.* Any third-party statistical and market-related data included or incorporated by reference in the Registration Statement, a Statutory Prospectus or the General Disclosure Package are based on or derived from sources that the Company believes to be reliable and accurate.

(ee) *Internal Controls and Compliance with the Sarbanes-Oxley Act.* The Company and its consolidated Subsidiaries maintain a system of internal accounting and other controls sufficient to provide reasonable assurances that (i) transactions are executed in accordance with management's general or specific authorizations; (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with generally accepted accounting principles in the United States ("**GAAP**") and to maintain accountability for assets; (iii) access to assets is permitted only in accordance with management's general or specific authorization; and (iv) the recorded accountability for assets is compared with existing assets at reasonable intervals and appropriate action is taken with respect to any differences. Except as described in the General Disclosure Package and the Final Prospectus, since the end of the Company's most recent audited fiscal year, there has been (A) no material weakness in the Company's internal control over financial reporting (whether or not remediated) and (B) 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. The Company is in compliance with all applicable provisions of Sarbanes-Oxley and all applicable rules and regulations promulgated thereunder or implementing the provisions thereof that are presently in effect.

(ff) *Litigation.* Except as set forth in the General Disclosure Package and the Final Prospectus, there is no legal or governmental action, suit, claim or proceeding pending to which the Company or any Subsidiary is a party or of which any property or assets of the Company or any Subsidiary is the subject which is required to be described in the Registration Statement, the General Disclosure Package or the Final Prospectus or a document incorporated by reference therein and is not described therein, or which, singularly or in the aggregate, if determined adversely to the Company or any Subsidiary, could have a Material Adverse Effect or prevent the consummation of the transactions contemplated hereby; and to the Company's knowledge, no such proceedings are threatened by governmental authorities or threatened by any third party.

(gg) *Financial Statements.* The financial statements, together with the related notes and schedules, included or incorporated by reference in the General Disclosure Package, the Final Prospectus and the Registration Statement fairly present the financial condition and the results of operations of the Company and its Subsidiaries at the respective dates or for the respective periods therein specified. Such statements and related notes and schedules have been prepared in accordance with GAAP applied on a consistent basis throughout the periods involved except as may be set forth in the related notes included or incorporated by reference in the General

9

Disclosure Package. The financial statements, together with the related notes and schedules, included or incorporated by reference in the General Disclosure Package and the Final Prospectus comply in all material respects with the Securities Act, the Exchange Act, and the Rules and Regulations.

(hh) *No Material Adverse Change in Business.* Neither the Company nor any Subsidiary has sustained, since the date of the latest audited financial statements included or incorporated by reference in the General Disclosure Package, any material loss or material 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 General Disclosure Package; and, since such date, there has not been any material change in the capital stock or long-term debt of the Company or any Subsidiary, or any material adverse changes, or any development involving a prospective material adverse change, in or affecting the business, assets, general affairs, management, financial position, prospects, stockholders' equity or results of operations of the Company or any Subsidiary otherwise than as set forth or contemplated in the General Disclosure Package and the Final Prospectus.

(ii) *Investment Company Act.* Neither the Company nor any Subsidiary is or, after giving effect to the offering of the Offered Securities and the application of the proceeds thereof as described in the General Disclosure Package and the Final Prospectus, will become an "investment company" within the meaning of the Investment Company Act of 1940, as amended, and the rules and regulations of the Commission thereunder.

(jj) *Ratings.* No "nationally recognized statistical rating organization" as such term is defined is defined in Section 3(a)(62) of the Exchange Act (i) has imposed (or has informed the Company that it is considering imposing) any condition (financial or otherwise) on the Company's retaining any rating assigned to the Company or any securities of the Company or (ii) has indicated to the Company that it is considering any of the actions described in Section 7(c)(ii) hereof.

(kk) *Taxes.* The Company and its Subsidiaries have filed all United States federal income tax returns that have been required to be filed and has paid all taxes shown thereon or otherwise assessed, which are due and payable, except assessments against which appeals have been or will be promptly taken and as to which adequate reserves have been provided. The Company and its Subsidiaries have filed all other tax returns that are required to have been filed by them pursuant to applicable state, local or foreign law, except insofar as the failure to file such returns would not have a Material Adverse Effect, and has paid all taxes shown thereon or otherwise assessed, which are due and payable, except assessments against which appeals have been or will be promptly taken and as to which adequate reserves have been provided. The Company and its subsidiaries have no tax deficiency that has been or, to the Company's knowledge, might be asserted or threatened against it that could have a Material Adverse Effect.

(ll) *PFIC Status.* The Company was not a "passive foreign investment company" ("PFIC") as defined in Section 1297 of the United States Internal Revenue Code of 1986, as amended (the "Code"), for its most recently completed taxable year and, based on the Company's current projected income, assets and activities, the Company does not expect to be classified as a PFIC for any subsequent taxable year.

(mm) *ERISA.* No "prohibited transaction" (as defined in Section 406 of the Employee Retirement Income Security Act of 1974, as amended, including the regulations and published interpretations thereunder ("ERISA"), or Section 4975 of the Internal Revenue Code of 1986, as amended from time to time (the "Code")) or "accumulated funding deficiency" (as defined in Section 302 of ERISA) or any of the events set forth in Section 4043(b) of ERISA (other than

10

events with respect to which the thirty (30)-day notice requirement under Section 4043 of ERISA has been waived) has occurred or could reasonably be expected to occur with respect to any employee benefit plan of the Company or any Subsidiary which could, singularly or in the aggregate, have a Material Adverse Effect. Each employee benefit plan of the Company or any Subsidiary is in compliance in all material respects with applicable law, including ERISA and the Code. Each of the Company and each Subsidiary has not incurred and could not reasonably be expected to incur liability under Title IV of ERISA with respect to the termination of, or withdrawal from, any pension plan (as defined in ERISA). Each pension plan for which the Company and each Subsidiary would have any liability that is intended to be qualified under Section 401(a) of the Code is so qualified, and nothing has occurred, whether by action or by failure to act, which could, singularly or in the aggregate, cause the loss of such qualification.

(nn) *FCPA.* Neither the Company nor, to the knowledge of the Company, any director, officer, agent, employee or affiliate of the Company is aware of or has taken any action, directly or indirectly, that would result in a violation by such persons of the Foreign Corrupt Practices Act of 1977, as amended, and the rules and regulations thereunder; and the Company and, to the knowledge of the Company, its affiliates have instituted and maintain policies and procedures reasonably designed to ensure continued compliance therewith.

(oo) *Office of Foreign Assets Control.* Neither the Company nor, to the knowledge of the Company, any director, officer, agent, employee or affiliate of the Company is currently subject to any U.S. sanctions administered by the Office of Foreign Assets Control of the U.S.

Treasury Department (“OFAC”); and the Company will not directly or indirectly use the proceeds of the offering of the Offered Securities contemplated hereby, or lend, contribute or otherwise make available such proceeds to any Subsidiary, joint venture partner or other person or entity for the purpose of financing the activities of any person currently subject to any U.S. sanctions administered by OFAC.

(pp) *No Unlawful Payments.* Neither the Company nor, to the knowledge of the Company, any director, officer, agent, employee or affiliate 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; or (iii) made any bribe, rebate, payoff, influence payment, kickback or, to the Company’s knowledge, other unlawful payment.

(qq) *Margin Securities.* Neither the Company nor any Subsidiary owns any “margin securities” as that term is defined in Regulation U of the Board of Governors of the Federal Reserve System (the “**Federal Reserve Board**”), and none of the proceeds of the sale of the Offered Securities will be used, directly or indirectly, for the purpose of purchasing or carrying any margin security, for the purpose of reducing or retiring any indebtedness which was originally incurred to purchase or carry any margin security or for any other purpose which might cause any of the Securities to be considered a “purpose credit” within the meanings of Regulation T, U or X of the Federal Reserve Board.

(rr) *Anti-Money Laundering.* The operations of the Company are and have been conducted at all times in compliance in all material respects with applicable financial recordkeeping and reporting requirements of the Currency and Foreign Transactions Reporting Act of 1970, as amended, the money laundering statutes of all applicable jurisdictions, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any governmental agency (collectively, the “**Money Laundering Laws**”); and no action, suit or proceeding by or before any court or governmental agency, authority or body or any arbitrator or non-governmental authority involving the Company with respect to the Money Laundering Laws is pending or, to the Company’s knowledge, threatened.

11

(ss) *FDA.* As to each of the Company’s product candidates subject to the jurisdiction of the U.S. Food and Drug Administration (“**FDA**”) under the Federal Food, Drug and Cosmetic Act, as amended, and the regulations thereunder (“**FDCA**”) that is manufactured, packaged, labeled, tested, and/or distributed by the Company or any of its Subsidiaries (each such product candidate, a “**Pharmaceutical Product**”), such Pharmaceutical Product is being manufactured, packaged, labeled, tested, and/or distributed by the Company in compliance with all applicable requirements under FDCA and other federal or state laws, rules and regulations relating to investigational use good manufacturing practices, good laboratory practices, good clinical practices, labeling, record keeping and filing of reports, except where the failure to be in compliance would not reasonably be expected to have a Material Adverse Effect. Except as disclosed in the Company’s filings with the Commission: (a) there is no pending, completed or, to the Company’s knowledge, threatened, action (including any lawsuit, arbitration, or legal or administrative or regulatory proceeding, charge, complaint, or investigation) against the Company or any of its Subsidiaries; and (b) none of the Company or any of its Subsidiaries has received any notice, warning letter or other communication from the FDA or any other governmental entity, which has not been resolved to date and which: (i) contests the distribution of, the manufacturing or packaging of, the testing of, or the labeling of any Pharmaceutical Product; (ii) requests the recall, or seizure of any Pharmaceutical Product; (iii) enjoins production at any facility of the Company or any of its Subsidiaries; (iv) enters or proposes to enter into a consent decree of permanent injunction with the Company or any of its Subsidiaries; or (v) otherwise alleges any violation of any laws, rules or regulations by the Company or any of its Subsidiaries, which either individually or in the aggregate, would have or reasonably be expected to have a Material Adverse Event. The properties, business and operations of the Company are being conducted in all material respects in accordance with all applicable laws, rules and regulations of the FDA. The Company has not been informed by the FDA that the FDA will prohibit the marketing, sale, or approval in the United States of any product proposed to be developed, produced or marketed by the Company.

(tt) *Insurance.* Each of the Company and each Subsidiary carries, or is covered by, insurance provided by recognized, financially sound and reputable institutions with policies in such amounts and covering such risks as is adequate, in the judgment of management, for the conduct of its business. The Company has no reason to believe that it or any Subsidiary will not be able (i) to renew its existing insurance coverage as and when such policies expire or (ii) to obtain comparable coverage from similar institutions as may be necessary or appropriate to conduct its business as now conducted and at a cost that would not result in a Material Adverse Effect.

(uu) *Outstanding Loans.* There are no outstanding loans, advances (except normal advances for business expenses in the ordinary course of business) or guarantees or indebtedness by the Company or its Subsidiaries to or for the benefit of any of the officers or directors of the Company, its Subsidiaries or any of their respective family members, except as disclosed in the Registration Statement, the General Disclosure Package and the Final Prospectus. All transactions by the Company with office holders or control persons of the Company have been duly approved by the board of directors of the Company, or duly appointed committees or officers thereof.

(vv) *XBRL Language.* The interactive data in eXtensible Business Reporting Language included as an exhibit to any document incorporated by reference into 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 in all material respects.

(ww) *Contracts.* There is no material agreement or document required by the Securities Act or by the Rules and Regulations to be described in the General Disclosure Package

12

and in the Final Prospectus or a document incorporated by reference therein or to be filed as an exhibit to the Registration Statement or a document incorporated by reference therein which is not so described or filed therein as required; and all descriptions of any such agreements or documents contained in the General Disclosure Package and in the Final Prospectus or in a document incorporated by reference therein are accurate and complete descriptions of such documents in all material respects. Other than as described in the General Disclosure Package or the Final Prospectus, no such agreement has been suspended or terminated for convenience or default by the Company or, to the Company’s knowledge, any of the other parties thereto, and the Company has not received notice of and the Company does not have knowledge of any such pending or threatened

suspension or termination except for such suspensions or terminations or pending or threatened suspensions or terminations that would not reasonably be expected to, singularly or in the aggregate, have a Material Adverse Effect.

(xx) *Outstanding Options.* All grants of options were validly issued and duly authorized by the board of directors of the Company (or a duly authorized committee thereof) in material compliance with all applicable laws and regulations and recorded in the Company's financial statements in accordance with GAAP.

(yy) *Related Party Transactions.* No relationship, direct or indirect, exists between or among the Company on the one hand, and the directors, officers, stockholders (or analogous interest holders), customers or suppliers of the Company or any of their affiliates on the other hand, which is required by the Securities Laws to be described in the General Disclosure Package and the Final Prospectus or a document incorporated by reference therein and which is not so described.

3. *Purchase, Sale and Delivery of Offered Securities.* On the basis of the representations, warranties and agreements and subject to the terms and conditions set forth herein, the Company agrees to sell to the several Underwriters, and each of the Underwriters agrees, severally and not jointly, to purchase from the Company, at a purchase price of \$1.932 per share, the respective number of shares of Firm Securities set forth opposite the names of the Underwriters in Schedule A hereto, plus any additional number of Firm Securities which such Underwriters may become obligated to purchase pursuant to the provisions of Section 9 hereof, with the Company and Underwriters agreeing that the purchase price shall be \$2.058 per share for shares that will be delivered to certain investors previously identified to the Underwriters (the "Company Investors") for up to a maximum (in aggregate) of 20% of the Offered Securities sold in the offering, and then the purchase price shall be \$1.932 for any shares delivered to Company Investors participating in the offering above the 20% threshold.

The Company will deliver the Offered Securities to or as instructed by the Representative for the accounts of the several Underwriters through the facilities of The Depository Trust Company issued in such names and in such denominations as the Representative shall request against payment of the purchase price by the Underwriters in Federal (same day) funds by wire transfer to an account at a bank designated in writing by the Company to the Representative drawn to the order of the Company at the office of Sichenzia Ross Ference Kesner LLP, 61 Broadway, 32nd Floor, New York, NY 10006, at 10:00 A.M., New York time, on April 26, 2017 or at such other time not later than ten full business days thereafter as the Representative and the Company determine, such time being herein referred to as the "**First Closing Date**". For purposes of Rule 15c6-1 under the Exchange Act, the First Closing Date (if later than the otherwise applicable settlement date) shall be the settlement date for payment of funds and delivery of securities for all the Offered Securities sold pursuant to the offering.

In addition, upon written notice from the Representative given to the Company from time to time not more than 45 days subsequent to the date of the Final Prospectus, the Underwriters may purchase all or less than all of the Optional Securities at the purchase price per share to be paid for the Firm Securities. The Company agrees to sell to the Underwriters the number of shares of Optional Securities specified in such notice and the Underwriters agree, severally and not jointly, to purchase such Optional Securities. Such

13

Optional Securities shall be purchased for the account of each Underwriter in the same proportion as the number of shares of Firm Securities set forth opposite such Underwriter's name bears to the total number of shares of Firm Securities (subject to adjustment by the Representative to eliminate fractions) and may be purchased by the Underwriters only for the purpose of covering over-allotments made in connection with the sale of the Firm Securities. No Optional Securities shall be sold or delivered unless the Firm Securities previously have been, or simultaneously are, sold and delivered. The right to purchase the Optional Securities or any portion thereof may be exercised from time to time and to the extent not previously exercised may be surrendered and terminated at any time upon notice by the Representative to the Company.

Each time for the delivery of and payment for the Optional Securities, being herein referred to as an "**Optional Closing Date**", which may be the First Closing Date (the First Closing Date and each Optional Closing Date, if any, being sometimes referred to as a "**Closing Date**"), shall be determined by the Representative but shall be not later than five full business days after written notice of election to purchase Optional Securities is given. The Company will deliver the Optional Securities being purchased on each Optional Closing Date to or as instructed by the Representative through the facilities of The Depository Trust Company issued in such names and in such denominations as the Representative shall request against payment of the purchase price therefor in Federal (same day) funds by wire transfer to an account at a bank designated in writing by the Company to the Representative drawn to the order of the Company, at the office of Sichenzia Ross Ference Kesner LLP.

It is understood that each Underwriter has authorized the Representative, for its account, to accept delivery of, receipt for, and make payment of the purchase price for, the Firm Securities and the Optional Securities, if any, which it has agreed to purchase.

Certificates for the shares comprising the Offered Securities, if any, shall be in such denominations and registered in such names as the Representative may request in writing at least one full business day before the applicable Closing Date. The certificates for the shares comprising the Offered Securities will be made available for examination and packaging by the Representative in the city of New York not later than 10:00 A.M. (Eastern time) on the business day prior to the Closing Date.

4. *Offering by Underwriters.* It is understood that the several Underwriters propose to offer the Offered Securities for sale to the public as set forth in the Final Prospectus.

5. *Certain Agreements of the Company.* The Company agrees with the several Underwriters that:

(a) *Filing of Prospectuses.* The Company has filed or will file each Statutory Prospectus (including the Final Prospectus) pursuant to and in accordance with Rule 424(b)(2) (or, if applicable and consented to by the Representative, subparagraph (5)) not later than the second business day following the earlier of the date it is first used or the execution and delivery of this Agreement. The Company has complied and will comply with Rule 433.

(b) *Filing of Amendments; Response to Commission Requests.* The Company will promptly advise the Representative of any proposal to amend or supplement the Registration Statement or any Statutory Prospectus at any time, will offer the Representative a reasonable opportunity to comment on any such amendment or supplement and will not file any such proposed amendment or supplement to which the Representative reasonably objects; and the Company will also advise the Representative promptly of (i) the filing of any such amendment or supplement, (ii) any

request by the Commission or its staff for any amendment to the Registration Statement, for any supplement to any Statutory Prospectus or for any additional information, (iii) the institution by the Commission of any stop order proceedings in respect of the Registration Statement or the threatening of any proceeding for that purpose, and (iv) the receipt by the

Company of any notification with respect to the suspension of the qualification of the Offered Securities in any jurisdiction or the institution or threatening of any proceedings for such purpose. The Company will use its commercially reasonable efforts to prevent the issuance of any such stop order or the suspension of any such qualification and, if issued, to obtain as soon as possible the withdrawal thereof.

(c) *Continued Compliance with Securities Laws.* If, at any time when a prospectus relating to the Offered Securities is (or but for the exemption in Rule 172 would be) required to be delivered under the Securities Act by any Underwriter or dealer, any event occurs as a result of which the Final Prospectus as then amended or supplemented would include an untrue statement of a material fact or omit to state any material fact necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading, or if it is necessary at any time to amend the Registration Statement or supplement the Final Prospectus to comply with the Securities Act, the Company will promptly notify the Representative of such event so that any use of the General Disclosure Package may cease until it is amended or supplemented and will promptly prepare and file with the Commission and furnish, at its own expense, to the Underwriters and the dealers and any other dealers in such quantities as the Representative may reasonably request, an amendment or supplement which will correct such statement or omission or an amendment which will effect such compliance. Neither the Representative's consent to, nor the Underwriters' delivery of, any such amendment or supplement shall constitute a waiver of any of the conditions set forth in Section 7 hereof.

(d) *Rule 158.* The Company will timely file such reports pursuant to the Exchange Act as are necessary in order to make generally available to its security holders as soon as practicable an earnings statement for the purposes of, and to provide to the Underwriters the benefits contemplated by, the last paragraph of Section 11(a) of the Securities Act and Rule 158.

(e) *Furnishing of Prospectuses.* The Company will furnish to the Representative copies of the Registration Statement, including all exhibits, any Statutory Prospectus, the Final Prospectus and all amendments and supplements to such documents, in each case as soon as available and in such quantities as the Representative reasonably request. The Company will pay the expenses of printing and distributing to the Underwriters all such documents.

(f) *Blue Sky Qualifications.* The Company will arrange for the qualification of the Offered Securities for sale under the laws of such jurisdictions as the Representative designates and will continue such qualifications in effect so long as required for the distribution; provided, however, that the Company shall not be obligated to qualify as a foreign corporation in any jurisdiction in which it is not so qualified or to file a general consent to service of process in any jurisdiction.

(g) *Reporting Requirements.* During the period of 2 years hereafter, the Company will furnish to the Representative and, upon request, to each of the other Underwriters, as soon as practicable after the end of each fiscal year, a copy of its annual report to stockholders for such year; and the Company will furnish to the Representative as soon as available, a copy of each report and any definitive proxy statement of the Company filed with the Commission under the Exchange Act or mailed to stockholders. However, so long as the Company is subject to the reporting requirements of either Section 13 or Section 15(d) of the Exchange Act and is timely filing reports with the Commission on its Electronic Data Gathering, Analysis and Retrieval system ("EDGAR"), it is not required to furnish such reports or statements to the Underwriters.

(h) *Payment of Expenses.*

(i) The Company will pay all expenses incident to the performance of its obligations under this Agreement, including but not limited to (a) all filing fees relating to the registration of the Offered Securities to be sold in the offering with the Commission; (b) all actual FINRA filing fees associated with the review of the offering by FINRA; (c) all actual fees and expenses relating to the listing of such Offered Securities on the NASDAQ CM; (d) all actual fees, expenses and disbursements relating to background checks of the Company's officers and directors; (e) all actual fees, expenses and disbursements relating to the registration or qualification of such Offered Securities under the "blue sky" securities laws of such states and other jurisdictions as the Underwriters may reasonably designate (including, without limitation, all filing and registration fees); (f) all actual fees, expenses and disbursements relating to the registration, qualification or exemption of such Offered Securities under the securities laws of such foreign jurisdictions as the Underwriters may reasonably deem necessary to comply with applicable law; (g) the costs of all mailing and printing of the underwriting documents (including, without limitation, this Agreement, any Blue Sky Surveys and, if appropriate, any Agreement Among Underwriters, Selected Dealers' Agreement, Underwriters' Questionnaire and Power of Attorney), the Registration Statement, any Statutory Prospectus, the Final Prospectus and all amendments, supplements and exhibits thereto as the Underwriters may reasonably deem necessary and as many Statutory Prospectuses and Final Prospectuses as the Underwriters may reasonably deem necessary; (h) the costs of preparing, printing and delivering certificates representing the Offered Securities; (i) fees and expenses of the transfer agent for the Common Stock; (j) stock transfer and/or stamp taxes, if any, payable upon the transfer of securities from the Company to the Underwriters; (k) the fees and expenses of the Company's accountants; (l) the legal fees and expenses and fees and expenses of any other agents and representatives of the Company incurred as a result of the offering; and (m) all fees and expenses of the Underwriters, including, without limitation, its legal fees and expenses, all such fees listed in (a) through (m) not to exceed \$60,000 in the aggregate. The Underwriters may deduct from the net proceeds of the offering payable to the Company on the First Closing Date, the expenses set forth herein to be paid by the Company to the Underwriters; provided, however, that in the event that the offering is terminated, the Company agrees to reimburse the Underwriters.

(ii) Notwithstanding anything to the contrary provided in Section 5(h)(i), if in connection with the offering, the Underwriters arrange one or more "road show" marketing trips for the Company's management to meet with prospective investors, each of the Company and the Underwriters will bear their own expenses related to such "road show" marketing trips.

(i) *Use of Proceeds.* The Company will use the net proceeds received in connection with this offering in the manner described in the “Use of Proceeds” section of the Final Prospectus and, except as disclosed in the General Disclosure Package and the Final Prospectus, the Company does not intend to use any of the proceeds from the sale of the Offered Securities hereunder to repay any outstanding debt owed to any affiliate of any Underwriter.

(j) *Right of First Refusal.* If within the ninety-day period following the termination of the engagement letter between the Company and the Representative, the Company shall require additional financing or other capital raising transaction (“**Subsequent Transactions**”) involving a placement agent or financial advisor, the Representative shall have the right to act as the Company’s financial advisor and investment banker on such Subsequent Transactions (the “**Right of First Refusal**”) as the book runner, lead manager, or lead placement agent. The Representative may exercise the Right of First Refusal within thirty days of the receipt of notice by the Company (as well as any reasonable requested due diligence of its decision to pursue a Subsequent Transaction). If the Representative shall determine to exercise its Right of First Refusal, the Company agrees to retain it under separate cover to advise it in respect to such Subsequent

16

Transaction, subject to the execution of a mutually acceptable separate agreement which shall include terms customary for the type of Subsequent Transaction being sought and compensation to be decided by the Company and the Representative at the time of the Subsequent Transaction.

(k) *Restriction on Sale of Securities.* For the period specified below (the “**Lock-Up Period**”), the Company will not, directly or indirectly, take any of the following actions with respect to its Securities or any securities convertible into or exchangeable or exercisable for any of its Securities (“**Lock-Up Securities**”): (i) offer, sell, issue, contract to sell, pledge or otherwise dispose of Lock-Up Securities, (ii) offer, sell, issue, contract to sell, contract to purchase or grant any option, right or warrant to purchase Lock-Up Securities, (iii) enter into any swap, hedge or any other agreement that transfers, in whole or in part, the economic consequences of ownership of Lock-Up Securities, (iv) establish or increase a put equivalent position or liquidate or decrease a call equivalent position in Lock-Up Securities within the meaning of Section 16 of the Exchange Act or (v) file with the Commission a registration statement under the Securities Act relating to Lock-Up Securities, or publicly disclose the intention to take any such action, without the prior written consent of the Representative. The restrictions set forth in this Section 5(k) shall not apply to (A) the sale of Offered Securities to the Underwriters; (B) the issuance of restricted Securities or options to acquire Securities pursuant to the Company’s employee benefit plans, qualified stock option plans or other employee compensation plans, as such plans are in existence on the date hereof and described in the General Disclosure Package and Final Prospectus, (C) the issuance of Securities pursuant to valid exercises of options, warrants or rights or upon valid conversion of securities outstanding on the date hereof, (D) the issuance by the Company of any Securities or securities convertible into or exchangeable for Securities as consideration for mergers, acquisitions, other business combinations or strategic alliances or acquisitions of intellectual property rights occurring after the dates of this Agreement; provided that each recipient of Securities pursuant to this clause (D) agrees that all such shares remain subject to restrictions substantially similar to those contained in this paragraph (k); or (E) the purchase or sale of the Company’s securities pursuant to a plan, contract or instruction that satisfies the requirements of Rule 10b5-1(c)(1)(i)(B) that was in effect prior to the date hereof. The initial Lock-Up Period will commence on the date hereof and continue for ninety (90) days after the date hereof or such earlier date that the Representative consents to in writing. If the Representative, in its sole discretion, agrees to release or waive the restrictions during the Lock-Up Period for an officer or director of the Company and provide the Company with notice of the impending release or waiver at least three (3) Business Days before the effective date of the release or waiver, the Company agrees to announce the impending release or waiver by a press release through a major news service at least two (2) Business Days before the effective date of the release or waiver.

(l) *Press Releases.* Prior to the First Closing Date, the Company agrees not to issue any press release or other communication directly or indirectly or hold any press conference with respect to the Company, its condition, financial or otherwise, or earnings, business affairs or business prospects (except for routine oral marketing communications in the ordinary course of business and consistent with the past practices of the Company and of which the Representative is notified), without the prior consent of the Representative, unless in the judgment of the Company and its counsel, and after notification to the Representative, such press release or communication is required by law.

(m) *Further Assurances.* The Company agrees to use its commercially reasonable efforts to do and perform all things required to be done or performed under this Agreement prior to the Closing Date and to satisfy all conditions precedent to the delivery of the Firm Securities or Optional Securities, as applicable.

6. *Free Writing Prospectuses.* The Company represents and agrees that, unless it obtains the prior consent of the Representative, and each Underwriter represents and agrees that, unless it obtains the prior consent of the Company and the Representative, it has not made and will not make any offer

17

relating to the Offered Securities that would constitute an Issuer Free Writing Prospectus, or that would otherwise constitute a “free writing prospectus,” as defined in Rule 405, required to be filed with the Commission. Any such free writing prospectus consented to by the Company and the Representative is hereinafter referred to as a “**Permitted Free Writing Prospectus**.” The Company represents that it has treated and agrees that it will treat each Permitted Free Writing Prospectus as an “issuer free writing prospectus,” as defined in Rule 433, and will comply with the requirements of Rules 164 and 433 applicable to any Permitted Free Writing Prospectus, including timely Commission filing where required, legending and record keeping.

7. *Conditions of the Obligations of the Underwriters.* The obligations of the several Underwriters to purchase and pay for the Firm Securities on the First Closing Date and the Optional Securities to be purchased on each Optional Closing Date will be subject to the accuracy of the representations and warranties of the Company herein (as though made on such Closing Date), to the accuracy of the statements of Company officers made pursuant to the provisions hereof, to the performance by the Company of its obligations hereunder and to the following additional conditions precedent:

(a) *Accountants’ Comfort Letter.* The Representative shall have received letters, dated the date hereof and each Closing Date, of Ernst & Young LLP confirming that they are a registered public accounting firm and independent public accountants within the meaning of the Securities Laws and in form and substance reasonably acceptable to the Representative (except that, in any letter dated a Closing Date, the specified date shall be a date no more than one day prior to such Closing Date).

(b) *Filing of Prospectus.* The Final Prospectus shall have been filed with the Commission in accordance with the Rules and Regulations and Section 5(a) hereof. No stop order suspending the effectiveness of the Registration Statement or of any part thereof shall have been issued and no proceedings for that purpose shall have been instituted or, to the knowledge of the Company or any Underwriter, shall be contemplated by the Commission.

(c) *No Material Adverse Change.* Subsequent to the execution and delivery of this Agreement, there shall not have occurred any of the following: (i) trading in securities generally on the New York Stock Exchange, Nasdaq Stock Market or the NYSE MKT LLC or in the over-the-counter market, or trading in any securities of the Company on any exchange or in the over-the-counter market, shall have been suspended or materially limited, or minimum or maximum prices or maximum range for prices shall have been established on any such exchange or such market by the Commission, by such exchange or market or by any other regulatory body or governmental authority having jurisdiction, (ii) a banking moratorium shall have been declared by federal or state authorities or a material disruption has occurred in commercial banking or securities settlement or clearance services in the United States, (iii) the United States shall have become engaged in hostilities, or the subject of an act of terrorism, or there shall have been an outbreak of or escalation in hostilities involving the United States, or there shall have been a declaration of a national emergency or war by the United States or (iv) there shall have occurred such a material adverse change in general economic, political or financial conditions (or the effect of international conditions on the financial markets in the United States shall be such) as to make it, in the judgment of the Representative, impracticable or inadvisable to proceed with the sale or delivery of the Securities on the terms and in the manner contemplated in the General Disclosure Package and the Final Prospectus. Since the date of the latest audited financial statements included in the General Disclosure Package and the Final Prospectus or incorporated by reference in the General Disclosure Package and Final Prospectus as of the date hereof, (i) neither the Company nor any Subsidiary shall have sustained any 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 in the General Disclosure Package and the Final Prospectus, and (ii) there shall not have been any change in the capital stock or long-term debt of the Company nor any Subsidiary, or any change, or any

18

development involving a prospective change, in or affecting the business, general affairs, management, financial position, stockholders' equity or results of operations of the Company and any Subsidiary, otherwise than as set forth in the General Disclosure Package and Final Prospectus, the effect of which, in any such case described in clause (i) or (ii) of this sentence, is, in the judgment of the Representative, so material and adverse as to make it impracticable or inadvisable to proceed with the sale or delivery of the Stock on the terms and in the manner contemplated in the General Disclosure Package and the Final Prospectus. No action shall have been taken and no law, statute, rule, regulation or order shall have been enacted, adopted or issued by any governmental agency or body which would prevent the issuance or sale of the Offered Securities or materially and adversely affect or potentially materially and adversely affect the business or operations of the Company or any Subsidiary; and no injunction, restraining order or order of any other nature by any federal or state court of competent jurisdiction shall have been issued which would prevent the issuance or sale of the Offered Securities or materially and adversely affect or potentially materially and adversely affect the business or operations of the Company or the Subsidiaries, taken as a whole.

(d) *Opinion of Counsel for Company.* The Representative shall have received an opinion and 10b-5 negative assurance letter, dated as of the applicable Closing Date, of Morgan, Lewis & Bockius LLP, corporate counsel for the Company, in form and substance reasonably acceptable to the Representative. The Representative shall have received an opinion and 10b-5 negative assurance letter, dated as of the applicable Closing Date, of Khalilian Sira, LLC, intellectual property counsel for the Company, in form and substance reasonably acceptable to the Representative.

(e) *Opinion of Counsel for Underwriters.* The Representative shall have received from Sichenzia Ross Ference Kesner LLP, counsel for the Underwriters, such opinion or opinions and 10b-5 negative assurance letter, dated as of such Closing Date, with respect to such matters as the Representative may require, and the Company shall have furnished to such counsel such documents as they reasonably request for the purpose of enabling them to pass upon such matters.

(f) *Officer's Certificate.* The Company shall have furnished to the Representative a certificate, dated as of such Closing Date, of its Chairman of the Board, its Chief Executive Officer or President and its Chief Financial Officer stating that (i) such officers have examined the Registration Statement, the General Disclosure Package, any Permitted Free Writing Prospectus and the Final Prospectus and, in their opinion, the Registration Statement and each amendment thereto, as of the Applicable Time and as of the date of this Agreement and as of such Closing Date, did not include any untrue statement of a material fact and did not omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading, and the General Disclosure Package, as of the Applicable Time and as of such Closing Date, any Permitted Free Writing Prospectus as of its date and as of such Closing Date, the Final Prospectus, as of the respective date thereof and as of such Closing Date, did not include any untrue statement of a material fact and did not omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances in which they were made, not misleading, (ii) since the effective date of the Registration Statement, no event has occurred which should have been set forth in a supplement or amendment to the Registration Statement, the General Disclosure Package or the Final Prospectus under the Securities Laws, (iii) to the their knowledge, as of such Closing Date, the representations and warranties of the Company in this Agreement are true and correct and the Company has complied with all agreements and satisfied all conditions on its part to be performed or satisfied hereunder at or prior to such Closing Date, and (iv) there has not been, subsequent to the date of the most recent audited financial statements included or incorporated by reference in the General Disclosure Package and the Final Prospectus, any material adverse change in the financial position or results of operations of the Company or the Subsidiaries, or any change or development that, singularly or in the aggregate, would involve a material adverse change or a prospective material adverse change, in or affecting the condition (financial or

19

otherwise), results of operations, business, assets or prospects of the Company or the Subsidiaries, except as set forth in General Disclosure Package and the Final Prospectus.

(g) *Certificate of Secretary.* The Company shall have furnished to the Representative a certificate, dated the Closing Date, of its Secretary certifying: (i) that each of the charter and bylaws of the Company is true and complete, has not been modified and is in full force and effect; (ii) that the resolutions of the Company's board of directors relating to the Offered Securities are in full force and effect and have not been

modified; and (iii) as to the accuracy and completeness of all correspondence between the Company or its counsel and the Commission with respect to the Registration Statement. The documents referred to in such certificate shall be attached to such certificate.

(h) *Listing.* NASDAQ CM shall have approved the Offered Securities for listing, subject only to official notice of issuance.

(i) *No Objection.* FINRA shall have confirmed that it has not raised any objection with respect to the fairness and reasonableness of the underwriting terms and arrangements relating to the offering of the Offered Securities.

(j) *Lock-up Agreements.* On or prior to the date hereof, the Representative shall have received lock-up letters in a form reasonably acceptable to Representative from the Company's directors and executive officers.

(k) *Conformed Copies; Waiver.* The Company will furnish the Representative with such conformed copies of such opinions, certificates, letters and documents as the Representative reasonably request. The Representative may in its sole discretion waive on behalf of the Underwriters compliance with any conditions to the obligations of the Underwriters hereunder, whether in respect of an Optional Closing Date or otherwise.

8. *Indemnification and Contribution.*

(a) *Indemnification of Underwriters.* The Company will indemnify and hold harmless each Underwriter, its partners, members, directors, officers, employees, agents, affiliates and each person, if any, who controls such Underwriter within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act (each, an "**Indemnified Party**"), against any and all losses, claims, damages or liabilities, joint or several, to which such Indemnified Party may become subject, under the Securities Act, the Exchange Act, other federal or state statutory law or regulation or otherwise, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon any untrue statement or alleged untrue statement of any material fact contained in any part of the Registration Statement, any Statutory Prospectus as of any time, the Final Prospectus or any Issuer Free Writing Prospectus, or arise out of or are based upon the omission or alleged omission of a material fact required to be stated therein or necessary to make the statements therein not misleading, and will reimburse each Indemnified Party for any legal or other expenses reasonably incurred by such Indemnified Party in connection with investigating or defending against any loss, claim, damage, liability, action, litigation, investigation or proceeding whatsoever (whether or not such Indemnified Party is a party thereto), whether threatened or commenced, and in connection with the enforcement of this provision with respect to any of the above as such expenses are incurred; provided, however, that the Company will not be liable in any such case to the extent that any such loss, claim, damage or liability arises out of or is based upon an untrue statement or alleged untrue statement in or omission or alleged omission from any of such documents in reliance upon and in conformity with written information furnished to the Company by any Underwriter through the Representative specifically for use

20

therein, it being understood and agreed that the only such information furnished by any Underwriter consists of the information described as such in subsection (b) below.

(b) *Indemnification of Company.* Each Underwriter will severally and not jointly indemnify and hold harmless the Company, each of its directors and each of its officers who signs a Registration Statement and each person, if any, who controls the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act (each, an "**Underwriter Indemnified Party**"), against any losses, claims, damages or liabilities to which such Underwriter Indemnified Party may become subject, under the Securities Act, the Exchange Act, other federal or state statutory law or regulation or otherwise, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon any untrue statement or alleged untrue statement of any material fact contained in any part of the Registration Statement, any Statutory Prospectus as of any time, the Final Prospectus, or any Issuer Free Writing Prospectus, or arise out of or are based upon the omission or the alleged omission of a material fact required to be stated therein or necessary to make the statements therein not misleading, in each case to the extent, but only to the extent, that such untrue statement or alleged untrue statement or omission or alleged omission was made in reliance upon and in conformity with written information furnished to the Company by such Underwriter through the Representative specifically for use therein, and will reimburse any legal or other expenses reasonably incurred by such Underwriter Indemnified Party in connection with investigating or defending against any such loss, claim, damage, liability, action, litigation, investigation or proceeding whatsoever (whether or not such Underwriter Indemnified Party is a party thereto), whether threatened or commenced, based upon any such untrue statement or omission, or any such alleged untrue statement or omission as such expenses are incurred, it being understood and agreed that the only such information furnished by any Underwriter consists of the following information in the "Underwriting" section of the Final Prospectus: the paragraphs under the heading "Discount, Commissions, and Expenses", "Stabilization, Short Positions and Penalty Bids" and (B) "Electronic Distribution".

(c) *Actions against Parties; Notification.* Promptly after receipt by an indemnified party under this Section of notice of the commencement of any action, such indemnified party will, if a claim in respect thereof is to be made against the indemnifying party under subsection (a) or (b) above, notify the indemnifying party of the commencement thereof; but the failure to notify the indemnifying party shall not relieve it from any liability that it may have under subsection (a) or (b) above except to the extent that it has been materially prejudiced (through the forfeiture of substantive rights or defenses) by such failure; and provided further that the failure to notify the indemnifying party shall not relieve it from any liability that it may have to an indemnified party otherwise than under subsection (a) or (b) above. In case any such action is brought against any indemnified party and it notifies the indemnifying party of the commencement thereof, the indemnifying party will be entitled to participate therein and, to the extent that it may wish, jointly with any other indemnifying party similarly notified, to assume the defense thereof, with counsel satisfactory to such indemnified party (who shall not, except with the consent of the indemnified party, be counsel to the indemnifying party), and after notice from the indemnifying party to such indemnified party of its election so to assume the defense thereof, the indemnifying party will not be liable to such indemnified party under this Section for any legal or other expenses subsequently incurred by such indemnified party in connection with the defense thereof except as set forth below. Notwithstanding the indemnifying party's election to appoint counsel to represent the indemnified party in an action, the indemnified party shall have the right to employ separate counsel (including local counsel), and the indemnifying party shall bear the reasonable fees, costs and expenses of such separate counsel if (i) the use of counsel chosen by the indemnifying party to represent the indemnified party would present such counsel with a conflict of interest, (ii) the actual or potential defendants in, or targets of, any such action include both the indemnified party and the indemnifying party and the indemnified party shall have reasonably concluded that there may be legal defenses available to it and/or other indemnified parties which are different from or

21

additional to those available to the indemnifying party, (iii) the indemnifying party shall not have employed counsel satisfactory to the indemnified party to represent the indemnified party within a reasonable time after notice of the institution of such action or (iv) the indemnifying party shall authorize the indemnified party to employ separate counsel at the expense of the indemnifying party. No indemnifying party shall, without the prior written consent of the indemnified party, effect any settlement of any pending or threatened action in respect of which any indemnified party is or could have been a party and indemnity could have been sought hereunder by such indemnified party unless such settlement (i) includes an unconditional release of such indemnified party from all liability on any claims that are the subject matter of such action 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 an indemnified party.

(d) *Contribution.* If the indemnification provided for in this Section is unavailable or insufficient to hold harmless an indemnified party under subsection (a) or (b) above, then each indemnifying party shall contribute to the amount paid or payable by such indemnified party as a result of the losses, claims, damages or liabilities referred to in subsection (a) or (b) above (i) in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and the Underwriters on the other from the offering of the Offered Securities or (ii) if the allocation provided by clause (i) above is not permitted by applicable law, in such proportion as is appropriate to reflect not only the relative benefits referred to in clause (i) above but also the relative fault of the Company on the one hand and the Underwriters on the other in connection with the statements or omissions which resulted in such losses, claims, damages or liabilities as well as any other relevant equitable considerations. The relative benefits received by the Company on the one hand and the Underwriters on the other 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 Underwriters. 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 or the Underwriters and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such untrue statement or omission. The amount paid by an indemnified party as a result of the losses, claims, damages or liabilities referred to in the first sentence of this subsection (d) shall be deemed to include any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any action or claim which is the subject of this subsection (d). Notwithstanding the provisions of this subsection (d), no Underwriter shall be required to contribute any amount in excess of the amount by which the total commissions and discounts at which the Securities underwritten by it and distributed to the public were offered to the public exceeds the amount of any damages which such 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 Underwriters' obligations in this subsection (d) to contribute are several in proportion to their respective underwriting obligations and not joint. The Company and the Underwriters agree that it would not be just and equitable if contribution pursuant to this Section 8(d) were determined by pro rata allocation (even if the Underwriters 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 in this Section 8(d).

9. *Default of Underwriters.* If any Underwriter or Underwriters default in their obligations to purchase Offered Securities hereunder on either the First or any Optional Closing Date and the aggregate number of shares of Offered Securities that such defaulting Underwriter or Underwriters agreed but failed to purchase does not exceed 10% of the total number of shares of Offered Securities that the Underwriters are obligated to purchase on such Closing Date, the Representative may make arrangements satisfactory to the Company for the purchase of such Offered Securities by other persons, including any of the

Underwriters, but if no such arrangements are made by such Closing Date, the non-defaulting Underwriters shall be obligated severally, in proportion to their respective commitments hereunder, to purchase the Offered Securities that such defaulting Underwriters agreed but failed to purchase on such Closing Date. If any Underwriter or Underwriters so default and the aggregate number of shares of Offered Securities with respect to which such default or defaults occur exceeds 10% of the total number of shares of Offered Securities that the Underwriters are obligated to purchase on such Closing Date and arrangements satisfactory to the Representative and the Company for the purchase of such Offered Securities by other persons are not made within 36 hours after such default, this Agreement will terminate without liability on the part of any non-defaulting Underwriter or the Company, except as provided in Section 10 (provided that if such default occurs with respect to Optional Securities after the First Closing Date, this Agreement will not terminate as to the Firm Securities or any Optional Securities purchased prior to such termination). As used in this Agreement, the term "Underwriter" includes any person substituted for an Underwriter under this Section. Nothing herein will relieve a defaulting Underwriter from liability for its default.

10. *Survival of Certain Representations and Obligations.* The respective indemnities, agreements, representations, warranties and other statements of the Company or its officers and of the several Underwriters 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 any 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 Offered Securities. If the purchase of the Offered Securities by the Underwriters is not consummated for any reason other than solely because of the termination of this Agreement pursuant to Sections 9 and 11 hereof, the Company will reimburse the Underwriters for all out-of-pocket expenses (including fees and disbursements of counsel) reasonably incurred by them in connection with the offering of the Offered Securities, and the respective obligations of the Company and the Underwriters pursuant to Section 8 hereof shall remain in effect. In addition, if any Offered Securities have been purchased hereunder, the representations and warranties in Section 2 and all obligations under Section 5 shall also remain in effect

11. *Termination of Agreement.*

(a) *Termination by the Representative.* The Representative may terminate this Agreement, by notice to the Company, at any time at or prior to the Closing Date (i) if there has been, since the time of execution of this Agreement or since the respective dates as of which information is given in the Prospectus or General Disclosure Package, any Material Adverse Effect, which, in the reasonable judgment of the Representative is material and adverse and makes it impractical or inadvisable to market the Securities, (ii) if trading in any securities of the Company has been suspended or materially limited by the Commission or the Nasdaq Global Market, or if trading in securities generally on the New York Stock Exchange, Nasdaq Stock Market or the NYSE MKT LLC or in the over-the-counter market, or trading in any securities of the Company on any exchange or in the over-the-counter market, shall have been suspended or materially limited, or minimum or maximum prices or maximum range for prices shall have been established on any such exchange or such market by the Commission, by such exchange or market or by any other regulatory body or governmental authority having jurisdiction, (iii) a banking moratorium shall have been declared by federal or state authorities or a material

disruption has occurred in commercial banking or securities settlement or clearance services in the United States, (iv) the United States shall have become engaged in hostilities, or the subject of an act of terrorism, or there shall have been an outbreak of or escalation in hostilities involving the United States, or there shall have been a declaration of a national emergency or war by the United States or (v) there shall have occurred such a material adverse change in general economic, political or financial conditions (or the effect of international conditions on the financial markets in the United States shall be such) as to make it, in the judgment of the Representative, impracticable or inadvisable to proceed with the sale or delivery of the Securities on the terms and in the manner contemplated in the General Disclosure Package and the Final Prospectus.

23

(b) *Liabilities.* If this Agreement is terminated pursuant to this Section, such termination shall be without liability of any party to any other party; provided, further, that Sections 8 and 10 shall survive such termination and remain in full force and effect.

(c) *Termination of Lock-Up Agreements.* In the event this Agreement is terminated for any reason, the Representative shall contemporaneously terminate or waive in their entirety the agreements referred to in Section 7(k) of this Agreement.

12. *Notices.* All notices and other communications hereunder will be in writing and will be deemed to have been duly given if mailed or transmitted by any standard form of telecommunication. Notices to the Underwriters shall be directed to the Representative at Laidlaw & Company (UK) Ltd., 546 Fifth Avenue, 5th Floor, New York, New York 10036, Attention: Hugh Regan, Executive Director — Investment Banking, with a copy to Sichenzia Ross Ference Kesner LLP, 61 Broadway, 32nd Floor, New York, New York 10006, Attention: Harvey J. Kesner, Esq., Notices to the Company shall be directed to it at 375 Pheasant Run, Newtown, PA 18940, Attention: [Ramesh Kumar] with a copy (which shall not constitute notice) to Morgan, Lewis & Bockius LLP, Attention: Joanne Soslow.

13. *Binding Effect; No Third Party Beneficiaries.* This Agreement will inure to the benefit of and be binding upon the parties hereto and their respective successors and, with respect to Section 8 only, the officers and directors and controlling persons referred to therein, and for the benefit of no other person, firm or corporation.

14. *Representation of Underwriters.* The Representative will act for the several Underwriters in connection with this financing, and any action under this Agreement taken by the Representative will be binding upon all the Underwriters.

15. *Waiver of Jury Trial.* The Company 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

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

17. *Absence of Fiduciary Relationship.* The Company acknowledges and agrees that:

(a) *No Other Relationship.* The Representative has been retained solely to act as an underwriter in connection with the sale of Offered Securities and that no fiduciary, advisory or agency relationship between the Company and the Representative have been created in respect of any of the transactions contemplated by this Agreement or the Final Prospectus, irrespective of whether the Representative has advised or is advising the Company on other matters;

(b) *Arms' Length Negotiations.* The price of the Offered Securities set forth in this Agreement was established by the Company following discussions and arms-length negotiations with the Representative and the Company is capable of evaluating and understanding and understands and accepts the terms, risks and conditions of the transactions contemplated by this Agreement;

(c) *Absence of Obligation to Disclose.* The Company has been advised that the Representative and their affiliates are engaged in a broad range of transactions which may involve interests that differ from those of the Company and that the Representative have no obligation to

24

disclose such interests and transactions to the Company by virtue of any fiduciary, advisory or agency relationship; and

18. *Headings.* The section headings in this Agreement are for the convenience of the parties only and will not affect the construction or interpretation of this Agreement.

19. *Applicable Law and Jurisdiction.* This Agreement shall be governed by, and construed in accordance with, the laws of the State of New York, without reference to its conflicts of law principles. The Company hereby submits to the non-exclusive jurisdiction of the federal and state courts in the Borough of Manhattan in The City of New York in any suit or proceeding arising out of or relating to this Agreement or the transactions contemplated hereby. The Company irrevocably and unconditionally waives any objection to the laying of venue of any suit or proceeding arising out of or relating to this Agreement or the transactions contemplated hereby in federal and state courts in the Borough of Manhattan in The City of New York and irrevocably and unconditionally waives and agrees not to plead or claim in any such court that any such suit or proceeding in any such court has been brought in an inconvenient forum.

20. *Integration.* This Agreement constitutes the entire agreement of the parties to this Agreement and supersedes all prior written or oral and all contemporaneous oral agreements, understandings and negotiations with respect to the subject matter hereof.

21. *Interpretation.* In this Agreement, the masculine, feminine and neuter genders and the singular and the plural include one another. The section headings in this Agreement are for the convenience of the parties only and will not affect the construction or interpretation of this Agreement.

22. *Amendments.* This Agreement may be amended or modified, and the observance of any term of this Agreement may be waived, only by a writing signed by the Company and the Representative.

23. *Partial Unenforceability.* The invalidity or unenforceability of any section, paragraph, clause or provision of this Agreement shall not affect the validity or enforceability of any other section, paragraph, clause or provision hereof. If any section, paragraph, clause or provision of this Agreement is for any reason determined to be invalid or unenforceable, there shall be deemed to be made such minor changes (and only such minor changes) as are necessary to make such invalid section, paragraph, clause or provision of this Agreement valid and enforceable.

(Remainder of page intentionally left blank. Signature page to follow.)

25

Please sign and return to the Company the enclosed duplicates of this letter whereupon this letter will become a binding agreement between the Company and the several Underwriters in accordance with its terms.

Very truly yours,

ONCONOVA THERAPEUTICS, INC.

By: /s/ Ramesh Kumar
Name: Ramesh Kumar, Ph.D.
Title: President and CEO

Confirmed as of the date first above-mentioned
by the Representative of the several Underwriters.

LIDLAW & COMPANY (UK) LTD.

By: /s/ Hugh Regan
Name: Hugh Regan
Title: Executive Director

SCHEDULE A

Underwriter	Number of Firm Securities	Number of Optional Securities
Laidlaw & Company (UK) Ltd.	2,476,190	363,580
Total	2,476,190	363,580

SCHEDULE B

1. General Use Free Writing Prospectuses (included in the General Disclosure Package)

Free Writing Prospectus dated April 20, 2017 and submitted to the Commission on April 20, 2017.

2. Other Information Included in the General Disclosure Package

The following information is also included in the General Disclosure Package:

1. The initial price to the public of the Offered Securities.
2. The amount of the Firm Securities and Optional Securities.

Morgan Lewis

April 24, 2017

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

RE: Onconova Therapeutics, Inc., Registration Statement on Form S-3 (File No. 333-199219)

Ladies and Gentlemen:

We have acted as counsel to Onconova Therapeutics, Inc., a Delaware corporation (the “Company”), in connection with the filing of (i) the preliminary prospectus supplement of the Company dated April 20, 2017, including the accompanying base prospectus (the “Base Prospectus”), which was filed by the Company with the SEC on April 20, 2017 pursuant to Rule 424(b)(5) promulgated under the Securities Act (the “Preliminary Prospectus Supplement”), and (ii) the final prospectus supplement of the Company dated April 20, 2017, including the accompanying Base Prospectus, which was filed by the Company with the SEC on April 24, 2017 pursuant to Rule 424(b)(5) promulgated under the Securities Act (the “Prospectus”), relating to the offering and sale by the Company of up to 2,839,770 shares (the “Shares”) of its common stock, \$0.01 par value (the “Common Stock”), which includes up to 363, 580 shares of Common Stock that the underwriters have an option to purchase.

In connection with this opinion letter, we have examined the referenced Registration Statement (the “Registration Statement”), the Base Prospectus, the Preliminary Prospectus Supplement, the Prospectus and originals, or copies certified or otherwise identified to our satisfaction, of the Certificate of Incorporation and Bylaws of the Company and such other documents, records and other instruments as we have deemed appropriate for purposes of the opinion set forth herein.

We have assumed the genuineness of all signatures, the legal capacity of all natural persons, the authenticity of the documents submitted to us as originals, the conformity with the originals of all documents submitted to us as certified, facsimile or photostatic copies and the authenticity of the originals of all documents submitted to us as copies.

Based upon the foregoing, we are of the opinion that the Shares have been duly authorized by the Company and, when issued and sold by the Company and delivered by the Company against receipt of the purchase price therefor, in the manner contemplated by the Prospectus, will be validly issued, fully paid and non-assessable.

The opinions expressed herein are limited to the laws of the State of Delaware.

We hereby consent to the use of this opinion as Exhibit 5.1 to the Registration Statement and to the reference to us under the caption “Legal Matters” in the Prospectus included in the Registration Statement. In giving such consent, we do not hereby admit that we are acting within the category of persons whose consent is required under Section 7 of the Securities Act or the rules or regulations of the SEC thereunder.

Very truly yours,

/s/ Morgan, Lewis & Bockius LLP

Morgan, Lewis & Bockius LLP

1701 Market Street
Philadelphia, PA 19103-2921
United States

📞 +1.215.963.5000
📠 +1.215.963.5001

Onconova Therapeutics Announces Pricing of Public Offering of Common Stock**Gross Proceeds to Support Phase 3 Trials of Rigosertib for Patients with Myelodysplastic Syndromes**

NEWTOWN, PA., April 21, 2017 (Globe Newswire)—Onconova Therapeutics, Inc. (NASDAQ:ONTX), 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 that it has priced an underwritten public offering of 2,476,190 shares of its common stock, at a price to the public of \$2.10 per share. Gross proceeds, before underwriting discounts and commissions and estimated offering costs, are expected to be approximately \$5.20 million.

Onconova intends to use the net proceeds from the offering to support development of rigosertib for treatment in higher risk MDS. The offering is expected to close on or about April 26, 2017, subject to satisfaction of customary closing conditions.

Laidlaw & Company Ltd. is acting as sole book-running manager for the offering and Onconova has granted Laidlaw & Company Ltd. a 45-day option to purchase up to 363,580 additional shares of common stock. To the extent Laidlaw & Company Ltd. exercises the option in full, the gross proceeds, before underwriting discounts and commissions and estimated offering costs, are expected to be approximately \$5.96 million.

Prior to the offering, as of April 19, 2017, the total number of issued and outstanding shares of common stock of Onconova was 7,011,393.

The securities described above are being offered by Onconova pursuant to a registration statement (File No. 333-199219) previously filed and declared effective by the Securities and Exchange Commission (SEC). This press release shall not constitute an offer to sell or the solicitation of an offer to buy, nor shall there be any sale of these securities in any state or 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 jurisdiction. The offering may be made only by means of a prospectus supplement and the accompanying prospectus, copies of which may be obtained, when available, from Laidlaw & Company Ltd, Attention: Syndicate Department, 546 Fifth Avenue, New York, NY 10036, by telephone at (212) 953-4900 or by email at syndicate@laidlawltd.com. Electronic copies of the final prospectus supplement and accompanying prospectus will also be available on the website of the SEC at www.sec.gov.

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 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, while causing minimal damage to normal cells. Onconova has three product candidates in the clinical stage and several pre-clinical programs. Advanced clinical trials with our lead compound, rigosertib, are aimed at what we believe 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. These statements relate to future events or Onconova Therapeutics, Inc.'s future operations, clinical development of Onconova's product candidates and presentation of data with respect thereto, regulatory approvals, expectations regarding the sufficiency of Onconova's cash and other resources to fund operating expenses and capital expenditures, Onconova's anticipated milestones and future expectations and plans and prospects. 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, and those discussed under the heading "Risk Factors" in Onconova's most recent Annual Report on Form 10-K and quarterly reports on Form 10-Q.

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.

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