
**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 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): February 12, 2018 (February 8, 2018)

CTI BIOPHARMA CORP.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction
of incorporation or organization)

001-12465
(Commission
File Number)

91-1533912
(I.R.S. Employer
Identification Number)

3101 Western Avenue, Suite 800
Seattle, Washington 98121
(Address of principal executive offices)

Registrant's telephone number, including area code: (206) 282-7100

Not applicable
(Former name or former address, if changed since last report).

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instruction A.2. below):

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
 - Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
 - Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
 - Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))
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Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter). Emerging growth company

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

Item 1.01. Entry into a Material Definitive Agreement.

(i) Underwriting Agreement

On February 8, 2018, CTI BioPharma Corp. (the “Company”) entered into an underwriting agreement (the “Underwriting Agreement”) with Leerink Partners LLC acting as sole book-running manager and as representative of the several underwriters named therein (collectively, the “Underwriters”), relating to the offer and sale (the “Offering”) of 20,000,000 shares of the Company’s common stock, par value \$0.001 per share (the “Common Stock”). The price to the public in this Offering is \$3.00 per share of Common Stock. The Underwriters have exercised in full their option to purchase an additional 3,000,000 shares. Upon closing of the Offering, the total number of issued and outstanding shares is expected to be approximately 57,982,990. The net proceeds to the Company from this Offering are expected to be approximately \$64.2 million, after deducting underwriting discounts, commissions and other estimated offering expenses.

The Company filed a shelf registration statement on Form S-3 (Registration Statement No. 333-221382) with the Securities and Exchange Commission (“SEC”) on November 7, 2017, which became effective on December 6, 2017 and was amended on January 24, 2018 and January 31, 2018, which amendments became effective on January 31, 2018 (collectively, the “Registration Statement”). The Offering was made pursuant to the Registration Statement, as supplemented by a preliminary prospectus supplement filed with the SEC on February 5, 2018, a free writing prospectus filed with the SEC on February 8, 2018, and a final prospectus supplement filed with the SEC on February 12, 2018.

The Company plans to use the net proceeds from this offering to (i) complete the PAC203 clinical trial, (ii) complete the review of the pacritinib MAA by the EMA, (iii) conduct additional research concerning the possible application of pacritinib in indications outside of myelofibrosis, and (iv) complete the PIX306 clinical trial, as well as for general corporate purposes, which may include funding research and development, conducting preclinical and clinical trials, acquiring or in-licensing potential new pipeline candidates, preparing and filing possible new drug applications and general working capital.

In the Underwriting Agreement, the Company has agreed to indemnify the Underwriters against certain liabilities, including liabilities under the Securities Act of 1933, as amended, or to contribute to payments that the Underwriters may be required to make because of such liabilities.

The above description of the Underwriting Agreement is qualified in its entirety by reference to the Underwriting Agreement, which is attached hereto as Exhibit 1.1.

A copy of the opinion of O’Melveny & Myers related to the legality of the Common Stock is attached hereto as Exhibit 5.1.

A copy of the Specimen Certificate of Common Stock is attached hereto as Exhibit 4.1.

(ii) BVF Exchange Agreement

On February 8, 2018, BVF Partners L.P. (“BVF Partners”) entered into an Exchange Agreement with the Company (the “Exchange Agreement”) to exchange 8,000,000 shares of Common Stock and 575 shares of the Company’s Series N Preferred Stock, par value \$0.001 per share, that BVF Partners owns into 12,575 shares of the Company’s Preferred Stock (defined below). BVF Partners is a beneficial owner of approximately 20.00% of the Common Stock, and Matthew Perry, President of BVF Partners, serves on the Board of the Company.

The above descriptions of the Exchange Agreement and the Preferred Stock are qualified in their entirety by reference to Exhibit 10.1 and 3.1 attached hereto, respectively.

Item 3.02. Unregistered Sales of Equity Securities.

The disclosure required by this Item and included in Items 1.01 and 3.03 of this Current Report on Form 8-K (this “Current Report”) is incorporated herein by reference.

Item 3.03. Material Modification to Rights of Security Holders.

On February 8, 2018, the Company filed a Certificate of Designation with the Secretary of State of the State of Delaware (the “Certificate of Designation”) to authorize the issuance of the Series O Convertible Preferred Stock, par value \$0.001 per share (the “Preferred Stock”). The following summary of certain terms and provisions of the Preferred Stock is subject to, and qualified in its entirety by reference to, the terms and provisions set forth in the Certificate of Designation of the Preferred Stock.

General. The Company’s board of directors has designated up to 12,575 shares of the 33,333 authorized shares of the Company’s preferred stock as the Preferred Stock. Each share of Preferred Stock has a stated value of \$2,000.

Rank. The Preferred Stock ranks on parity to our Common Stock.

Conversion. Each share of Preferred Stock is convertible into shares of Common Stock at any time at the option of the holder thereof, into the number of shares of Common Stock determined with reference to the Conversion Ratio (as defined in the Certificate of Designation). Holders of the Preferred Stock are prohibited from converting Preferred Stock into shares of Common Stock if, as a result of such conversion, the holder, together with its affiliates, would own more than 9.99% of the total number of shares of Common Stock issued and outstanding immediately after giving effect to such conversion. However, any holder may reset such percentage to a higher percentage not to exceed 19.99%, provided that any increase in such percentage shall not be effective until 61 days after notice to the Company.

Liquidation Preference. Upon any liquidation, dissolution or winding-up of the Company, the holders of Preferred Stock shall be entitled to receive an amount equal to the Stated Value of \$2,000 per share for each outstanding share of the Preferred Stock, plus any declared and unpaid dividends and any other payments that may be due thereon, before any distribution or payment shall be made on any Junior Securities (as defined in the Certificate of Designation).

Voting Rights. Shares of Preferred Stock generally have no voting rights, except as otherwise expressly provided in the Certificate of Designation or as otherwise required by law. However, as long as any shares of Preferred Stock are outstanding, the Company shall not, without the affirmative vote of the Holders of a majority of the then outstanding shares of the Preferred Stock, (i) alter or change adversely the powers, preferences or rights given to the Preferred Stock or alter or amend this Certificate of Designation, amend or repeal any provision of, or add any provision to, the Certificate of Incorporation or bylaws of the Company, or file any articles of amendment, certificate of designations, preferences, limitations and relative rights of any series of preferred stock, if such action would adversely alter or change the preferences, rights, privileges or powers of, or restrictions provided for the benefit of the Preferred Stock, regardless of whether any of the foregoing actions shall be by means of amendment to the Certificate of Incorporation or by merger, consolidation or otherwise, (ii) issue further shares of Preferred Stock or increase or decrease (other than by conversion) the number of authorized shares of Preferred Stock, or (iii) enter into any agreement with respect to any of the foregoing.

Dividends. Holders of Preferred Stock are entitled to receive dividends on shares of Preferred Stock equal (on an as-if-converted to Common Stock basis, without regard to the Beneficial Ownership Limitation (as defined in the Certificate of Designation)) to and in the same form as dividends actually paid on shares of Common Stock when, as and if such dividends are paid on shares of Common Stock. No other dividends shall be paid on shares of Preferred Stock.

The shares of Preferred Stock have been issued in reliance on the exemption from registration contained in Section 3(a)(9) of the Securities Act of 1933, as amended. This Current Report does not constitute an offer to sell or the solicitation of an offer to buy any security and shall not constitute an offer, solicitation or sale in any jurisdiction in which such offer, solicitation or sale would be unlawful.

The foregoing description of the Preferred Stock does not purport to be complete and is qualified by reference to the Certificate of Designation of the Preferred Stock, a copy of which is filed as Exhibit 3.1 to this Current Report and is incorporated herein by reference.

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

The disclosure required by this Item and included in Item 3.03 of this Current Report is incorporated herein by reference.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Description
1.1	<u>Underwriting Agreement, dated February 8, 2018, by and between the Company and Leerink Partners LLC.</u>
3.1	<u>Certificate of Designation for Series O Convertible Preferred Stock.</u>
4.1	<u>Specimen Certificate of Common Stock.</u>
5.1	<u>Opinion of O'Melveny & Myers.</u>
10.1	<u>Exchange Agreement, by and between the Company and BVF Partners L.P., dated February 8, 2018.</u>
23.1	Consent of O'Melveny & Myers (included in Exhibit 5.1 hereto).

SIGNATURE

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

CTI BIOPHARMA CORP.

Date: February 12, 2018

By:

/s/ David H. Kirske

David H. Kirske
Chief Financial Officer

EXHIBIT INDEX

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20,000,000 Shares

CTI BioPharma Corp.

Common Stock

UNDERWRITING AGREEMENT

February 8, 2018

LEERINK PARTNERS LLC
As Representative of the several Underwriters

LEERINK PARTNERS LLC
299 Park Avenue, 21st Floor
New York, New York 10171

Ladies and Gentlemen:

Introductory. CTI BioPharma Corp., a Delaware corporation (the “**Company**”), proposes to issue and sell to the several underwriters named in Schedule A (the “**Underwriters**”) an aggregate of 20,000,000 shares of its common stock, par value \$0.001 per share (the “**Shares**”). The 20,000,000 Shares to be sold by the Company are called the “**Firm Shares**.” In addition, the Company has granted to the Underwriters an option to purchase up to an additional 3,000,000 Shares as provided in Section 2. The additional 3,000,000 Shares to be sold by the Company pursuant to such option are called the “**Optional Shares**.” The Firm Shares and, if and to the extent such option is exercised, the Optional Shares are collectively called the “**Offered Shares**.” Leerink Partners LLC (“**Leerink**”) has agreed to act as representative of the several Underwriters (in such capacity, the “**Representative**”) in connection with the offering and sale of the Offered Shares. To the extent there are no additional underwriters listed on Schedule A, the term “**Representative**” as used herein shall mean you, as Underwriter, and the term “**Underwriters**” shall mean either the singular or the plural, as the context requires.

The Company has prepared and filed with the Securities and Exchange Commission (the “**Commission**”) a shelf registration statement on Form S-3 (File No. 333-221382), including a base prospectus (the “**Base Prospectus**”) to be used in connection with the public offering and sale of the Offered Shares. Such registration statement, as amended, including the financial statements, exhibits and schedules thereto, in the form in which they became effective under the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder (collectively, the “**Securities Act**”), including all documents incorporated or deemed to be incorporated by reference therein and any information deemed to be a part thereof at the time of effectiveness pursuant to Rule 430A or 430B under the Securities Act, is called the “**Registration Statement**.” Any registration statement filed by the Company pursuant to Rule 462(b) under the Securities Act in connection with the offer and sale of the Offered Shares is called the “**Rule 462(b) Registration Statement**,” and from and after the date and time of filing of any such Rule 462(b) Registration Statement the term “**Registration Statement**” shall include the Rule 462(b) Registration Statement. The preliminary prospectus supplement dated February 5, 2018 describing the Offered Shares and the offering thereof (the “**Preliminary Prospectus Supplement**”), together with the Base Prospectus, is called the “**Preliminary Prospectus**,” and the Preliminary Prospectus and any other prospectus supplement to the Base Prospectus in

preliminary form that describes the Offered Shares and the offering thereof and is used prior to the filing of the Prospectus (as defined below), together with the Base Prospectus, is called a “**preliminary prospectus.**” As used herein, the term “**Prospectus**” shall mean the final prospectus supplement to the Base Prospectus that describes the Offered Shares, and the offering thereof (the “**Final Prospectus Supplement**”), together with the Base Prospectus, in the form first used by the Underwriters to confirm sales of the Offered Shares or in the form first made available to the Underwriters by the Company to meet requests of purchasers pursuant to Rule 173 under the Securities Act. References herein to the Preliminary Prospectus, any preliminary prospectus and the Prospectus shall refer to both the prospectus supplement and the Base Prospectus components of such prospectus. As used herein, “**Applicable Time**” is 5:30 p.m. (New York time) on February 8, 2018. As used herein, “**free writing prospectus**” has the meaning set forth in Rule 405 under the Securities Act, and “**Time of Sale Prospectus**” means the Preliminary Prospectus, as amended or supplemented immediately prior to the Applicable Time, together with the free writing prospectuses, if any, identified in Schedule B and the pricing information conveyed orally by the Underwriters and set forth in Schedule B, if any. As used herein, “**Road Show**” means a “road show” (as defined in Rule 433 under the Securities Act) relating to the offering of the Offered Shares contemplated hereby that is a “written communication” (as defined in Rule 405 under the Securities Act). As used herein, the terms “**Registration Statement,**” “**Preliminary Prospectus**” “**preliminary prospectus,**” “**Base Prospectus**” and “**Prospectus**” shall include the documents incorporated or deemed to be incorporated by reference therein. All references in this Agreement to financial statements and schedules and other information which are “**contained,**” “**included**” or “**stated**” in the Registration Statement, the Rule 462(b) Registration Statement, the Preliminary Prospectus, any preliminary prospectus, the Base Prospectus, the Time of Sale Prospectus or the Prospectus, and all other references of like import, shall be deemed to mean and include all such financial statements and schedules and other information which is or is deemed to be incorporated by reference in the Registration Statement, the Rule 462(b) Registration Statement, the Preliminary Prospectus, any preliminary prospectus, the Base Prospectus, the Time of Sale Prospectus or the Prospectus, as the case may be. All references in this Agreement to amendments or supplements to the Registration Statement, the Preliminary Prospectus, any preliminary prospectus, the Base Prospectus, the Time of Sale Prospectus or the Prospectus shall be deemed to mean and include the filing of any document under the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder (collectively, the “**Exchange Act**”) that is or is deemed to be incorporated by reference in the Registration Statement, the Preliminary Prospectus, any preliminary prospectus, the Base Prospectus, or the Prospectus, as the case may be. All references in this Agreement to (i) the Registration Statement, the Preliminary Prospectus, any preliminary prospectus, the Base Prospectus or the Prospectus, any amendments or supplements to any of the foregoing, or any free writing prospectus, shall include any copy thereof filed with the Commission pursuant to its Electronic Data Gathering, Analysis and Retrieval System (“**EDGAR**”) and (ii) the Prospectus shall be deemed to include any “**electronic Prospectus**” provided for use in connection with the offering of the Offered Shares as contemplated by Section 3(n) of this Agreement.

Prior to the date of this Agreement, the following transactions have occurred:

a) The shareholders of CTI BioPharma Corp., a Washington corporation and a predecessor of the Company (“**Oldco**”) have approved the reincorporation of Oldco from the State of Washington to the State of Delaware by combining Oldco with the Company (the “**Merger**”);

- b) The Company and Oldco have entered into an Agreement and Plan of Merger (the “**Merger Agreement**”);
- c) The Merger has become effective; and
- d) The delisting of the Shares from the Borsa Italiana S.p.A. has become effective.

In connection with the consummation of the Merger, the Company and Oldco entered into, as applicable, merger agreements and certificates and articles of merger (collectively, the “**Merger Documents**”).

The Company hereby confirms its agreements with the Underwriters as follows:

Section 1. Representations and Warranties.

Representations and Warranties of the Company. The Company hereby represents, warrants and covenants to each Underwriter, as of the date of this Agreement, as of the First Closing Date (as hereinafter defined) and as of each Option Closing Date (as hereinafter defined), if any, as follows:

(a) Compliance with Registration Requirements. The Registration Statement has become effective under the Securities Act. The Company has complied, to the Commission’s satisfaction with all requests of the Commission for additional or supplemental information, if any. No stop order suspending the effectiveness of the Registration Statement is in effect and no proceedings for such purpose have been instituted or are pending or, to the best knowledge of the Company, are contemplated or threatened by the Commission. At the time the Registration Statement was originally filed with the Commission and at the time the Company’s Annual Report on Form 10-K for the year ended December 31, 2016, as amended, (the “**Annual Report**”) was filed with the Commission, the Company met the then-applicable requirements for use of Form S-3 under the Securities Act. The documents incorporated or deemed to be incorporated by reference in the Registration Statement, the Time of Sale Prospectus and the Prospectus, at the time they were or hereafter are filed with the Commission, or became effective under the Exchange Act, as the case may be, complied and will comply in all material respects with the requirements of the Exchange Act.

(b) Disclosure. Each preliminary prospectus and the Prospectus, when filed, or hereinafter is filed, complied and will comply in all material respects with the Securities Act and, if filed by electronic transmission pursuant to EDGAR, was identical (except as may be permitted by Regulation S T under the Securities Act) to the copy thereof delivered to the Underwriters for use in connection with the offer and sale of the Offered Shares. Each of the Registration Statement and any post-effective amendment thereto, at the time it became or becomes effective and at all subsequent times, until the expiration of the period during which a prospectus relating to the Offered Shares is required by the Securities Act to be delivered (whether physically or through compliance with Rule 172 under the Securities Act or any similar rule) complied and will comply in all material respects with the Securities Act and did not and will not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading. As of the Applicable Time, the Time of Sale Prospectus did not, and at the First Closing Date (as defined in Section 2 and at each applicable Option Closing Date (as defined in Section 2), the Time of Sale Prospectus, as then amended or supplemented by the Company, if applicable, will not, contain any untrue statement

of a material fact or omit to state a material fact necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading. The Prospectus, as of its date and (as then amended or supplemented) at all subsequent times, did not and will not contain any untrue statement of a material fact or 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. The representations and warranties set forth in the three immediately preceding sentences do not apply to statements in or omissions from the Registration Statement or any post-effective amendment thereto, or the Prospectus or the Time of Sale Prospectus, or any amendments or supplements thereto, made in reliance upon and in conformity with written information relating to any Underwriter furnished to the Company in writing by the Representative expressly for use therein, it being understood and agreed that the only such information consists of the information described in Section 9(b) below. There are no contracts or other documents required to be described in the Time of Sale Prospectus or the Prospectus or to be filed as an exhibit to the Registration Statement which have not been described or filed as required.

(c) Free Writing Prospectuses; Road Show. As of the determination date referenced in Rule 164(h) under the Securities Act, the Company was not, is not or will not be (as applicable) an “ineligible issuer” in connection with the offering of the Offered Shares pursuant to Rules 164, 405 and 433 under the Securities Act. Each free writing prospectus that the Company is required to file pursuant to Rule 433(d) under the Securities Act has been, or will be, filed with the Commission in accordance with the applicable requirements of the Securities Act. Each free writing prospectus that the Company has filed, or is required to file, pursuant to Rule 433(d) under the Securities Act or that was prepared by or on behalf of or used or referred to by the Company complies or will comply in all material respects with the requirements of Rule 433 under the Securities Act, including timely filing with the Commission or retention where required and legending, and each such 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 Shares did not, does not and will not include any information that conflicted, conflicts or will conflict with the information contained in the Registration Statement, the Prospectus or any preliminary prospectus to the extent not superseded or modified. Except for the free writing prospectuses, if any, identified in Schedule B, and electronic road shows, if any, furnished to you before first use, the Company has not prepared, used or referred to, and will not, without your prior written consent, prepare, use or refer to, any free writing prospectus. Each Road Show, when considered together with the Time of Sale Prospectus, did not, as of the Applicable Time, contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading.

(d) Distribution of Offering Material By the Company. Prior to the later of (i) the expiration or termination of the option granted to the several Underwriters in Section 2, and (ii) the completion of the Underwriters’ distribution of the Offered Shares, the Company has not distributed and will not distribute any offering material in connection with the offering and sale of the Offered Shares other than the Registration Statement, the Time of Sale Prospectus and the Prospectus.

(e) The Underwriting Agreement. This Agreement has been duly authorized, executed and delivered by the Company.

(f) **Authorization of the Offered Shares.** The Offered Shares have been duly authorized for issuance and sale pursuant to this Agreement and, when issued and delivered by the Company against payment therefor pursuant to this Agreement, will be validly issued, fully paid and nonassessable and will not be subject to any preemptive rights, rights of first refusal or other similar rights to subscribe for or purchase the Offered Shares.

(g) **No Applicable Registration or Other Similar Rights.** There are no persons with registration or other similar rights to have any equity or debt securities registered for sale under the Registration Statement or included in the offering contemplated by this Agreement.

(h) **No Material Adverse Change.** Except as otherwise disclosed in the Registration Statement, the Time of Sale Prospectus and the Prospectus, subsequent to the respective dates as of which information is given in the Registration Statement, the Time of Sale Prospectus and the Prospectus: (i) there has been no material adverse change, or any development that could reasonably be expected to result in a material adverse change, in the condition, financial or otherwise, or in the earnings, business, properties, operations or prospects, whether or not arising from transactions in the ordinary course of business, of the Company and its subsidiaries, considered as one entity (any such change being referred to herein as a “**Material Adverse Change**”); (ii) the Company and its subsidiaries, considered as one entity have not incurred any material liability or obligation, indirect, direct or contingent, not in the ordinary course of business nor entered into any material transaction or agreement not in the ordinary course of business; and (iii) there has been no dividend or distribution of any kind declared, paid or made by the Company or, except for dividends paid to the Company or other subsidiaries, any of its subsidiaries on any class of capital stock or repurchase or redemption by the Company or any of its subsidiaries of any class of capital stock.

(i) **Independent Accountants.** Marcum LLP, which has expressed its opinion with respect to the financial statements (which term as used in this Agreement includes the related notes thereto) and supporting schedules filed with the Commission as a part of and incorporated by reference into the Registration Statement, the Time of Sale Prospectus and the Prospectus, is (i) an independent registered public accounting firm as required by the Securities Act, the Exchange Act, and the rules of the Public Company Accounting Oversight Board (“**PCAOB**”), (ii) in compliance with the applicable requirements relating to the qualification of accountants under Rule 2-01 of Regulation S-X under the Securities Act and (iii) is a registered public accounting firm as defined by the PCAOB whose registration has not been suspended or revoked and who has not requested such registration to be withdrawn.

(j) **Financial Statements.** The financial statements filed with the Commission as a part of and incorporated by reference into the Registration Statement, the Time of Sale Prospectus and the Prospectus present fairly in all material respects the consolidated financial position of the Company and its subsidiaries as of the dates indicated and the results of their operations, changes in stockholders’ equity and cash flows for the periods specified. The supporting schedules included in the Registration Statement present fairly in all material respects the information required to be stated therein. Such financial statements and supporting schedules have been prepared in conformity with generally accepted accounting principles as applied in the United States applied on a consistent basis throughout the periods involved, except as may be expressly stated in the related notes thereto. The interactive data in eXtensible Business Reporting Language included or incorporated by reference in the Registration Statement presents fairly in all material respects the information called for and has been prepared in accordance with the

Commission's rules and guidelines applicable thereto. No other financial statements or supporting schedules are required to be included in the Registration Statement, the Time of Sale Prospectus or the Prospectus. The financial data set forth in the Annual Report, under the caption "Item 6. Selected Financial Data" and incorporated by reference into the Registration Statement, the Time of Sale Prospectus and the Prospectus fairly present in all material respects the information set forth therein on a basis consistent with that of the audited financial statements contained in the Registration Statement, the Time of Sale Prospectus and the Prospectus. The Company's ratios of earnings to combined fixed charges and preferred stock dividends set forth in the Registration Statement, the Time of Sale Prospectus and the Prospectus under the caption "Ratios of Earnings to Fixed Charges and of Earnings to Combined Fixed Charges and Preferred Stock Dividends" and in Exhibit 12.1 to the Registration Statement have been calculated in compliance with Item 503(d) of Regulation S-K under the Securities Act. All disclosures contained in the Registration Statement, any preliminary prospectus, the Prospectus and any free writing prospectus, or in any document incorporated by reference therein, that constitute non-GAAP financial measures (as defined by the rules and regulations under the Securities Act and the Exchange Act) comply in all material respects with Regulation G under the Exchange Act and Item 10 of Regulation S-K under the Securities Act, as applicable. To the Company's knowledge, no person who has been suspended or barred from being associated with a registered public accounting firm, or who has failed to comply with any sanction pursuant to Rule 5300 promulgated by the PCAOB, has participated in or otherwise aided the preparation of, or audited, the financial statements, supporting schedules or other financial data filed with the Commission as a part of the Registration Statement, the Time of Sale Prospectus and the Prospectus.

(k) *Company's Accounting System.* The Company and each of its subsidiaries make and keep accurate books and records and maintain a system of internal accounting controls sufficient to provide reasonable assurance that: (i) transactions are executed in accordance with management's general or specific authorization; (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with generally accepted accounting principles as applied in the United States 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.

(l) *Disclosure Controls and Procedures; Deficiencies in or Changes to Internal Control Over Financial Reporting.* The Company has established and maintains disclosure controls and procedures (as defined in Rules 13a-15 and 15d-15 under the Exchange Act), which (i) are designed to ensure that material information relating to the Company, including its consolidated subsidiaries, is made known to the Company's principal executive officer and its principal financial officer by others within those entities, particularly during the periods in which the periodic reports required under the Exchange Act are being prepared; (ii) have been evaluated by management of the Company for effectiveness as of the end of the Company's most recent fiscal quarter; and (iii) the Company's principal executive officer and principal financial officer have concluded, as of the end of such fiscal quarter, are effective. Since the end of the Company's most recent audited fiscal year, there have been no significant deficiencies or material weakness in the Company's internal control over financial reporting (whether or not remediated) and 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.

(m) *Incorporation and Good Standing of the Company.* The Company has been duly incorporated and is validly existing as a corporation in good standing under the laws of the jurisdiction of its incorporation and has the corporate power and authority to own, lease and operate its properties and to conduct its business as described in the Registration Statement, the Time of Sale Prospectus and the Prospectus and to enter into and perform its obligations under this Agreement. The Company is duly qualified as a foreign corporation to transact business and in good standing in each other jurisdiction in which such qualification is required, whether by reason of the ownership or leasing of property or the conduct of business, except where the failure to be so qualified or in good standing could not reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect (as defined below).

(n) *Subsidiaries.* Each of the Company's "subsidiaries" (for purposes of this Agreement, as defined in Rule 405 under the Securities Act) has been duly incorporated or organized, as the case may be, and is validly existing as a corporation, partnership or limited liability company, as applicable, in good standing under the laws of the jurisdiction of its incorporation or organization, and has the power and authority (corporate or other) to own, lease and operate its properties and to conduct its business as described in the Registration Statement, the Time of Sale Prospectus and the Prospectus, except where the failure to be in good standing could not reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect (as defined below). Each of the Company's subsidiaries is duly qualified as a foreign corporation, partnership or limited liability company, as applicable, to transact business and is in good standing in each jurisdiction in which such qualification is required, whether by reason of the ownership or leasing of property or the conduct of business, except where the failure to be so qualified or in good standing could not reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect (as defined below). All of the issued and outstanding capital stock or other equity or ownership interests of each of the Company's subsidiaries have been duly authorized and validly issued, are fully paid and nonassessable and, except as disclosed in the Registration Statement, the Time of Sale Prospectus and the Prospectus, are owned by the Company, directly or through subsidiaries, free and clear of any security interest, mortgage, pledge, lien, encumbrance or adverse claim. The Company does not own or control, directly or indirectly, any corporation, association or other entity other than the subsidiaries listed in Exhibit 21.1 to the Annual Report and CTI Life Sciences Deutschland GmbH.

(o) *Capitalization and Other Capital Stock Matters.* The authorized, issued and outstanding capital stock of the Company is as set forth in the Registration Statement, the Time of Sale Prospectus and the Prospectus (other than for subsequent issuances, if any, pursuant to employee benefit plans, or upon the exercise of outstanding options or warrants, in each case described in the Registration Statement, the Time of Sale Prospectus and the Prospectus) or which the Registration Statement, the Time of Sale Prospectus and the Prospectus otherwise contemplate will occur or as otherwise permitted hereunder). The Shares conform in all material respects to the description thereof contained in the Registration Statement, the Time of Sale Prospectus and the Prospectus. All of the issued and outstanding capital stock of the Company have been duly authorized and validly issued, are fully paid and nonassessable and have been issued in compliance with all federal and state securities laws. None of the outstanding capital stock of the Company were issued in violation of any preemptive rights, rights of first refusal or other similar rights to subscribe for or purchase securities of the Company. There are no authorized or outstanding options, warrants, preemptive rights, rights of first refusal or other rights to purchase, or equity or debt securities convertible into or exchangeable or exercisable for, any capital stock of the Company or any of its subsidiaries other than those described in the

Registration Statement, the Time of Sale Prospectus and the Prospectus. The description of the Company's stock option, stock bonus and other stock plans or arrangements, and the options or other rights granted thereunder, set forth in the Registration Statement, the Time of Sale Prospectus and the Prospectus accurately and fairly presents in all material respects the information required to be shown with respect to such plans, arrangements, options and rights.

(p) *Stock Exchange Listing.* The Shares are registered pursuant to Section 12(b) of the Exchange Act and are listed on The NASDAQ Capital Market (the "**NASDAQ**"), and the Company has taken no action designed to, or likely to have the effect of, terminating the registration of the Shares under the Exchange Act or delisting the Shares from the NASDAQ, nor has the Company received any notification that the Commission or the NASDAQ is contemplating terminating such registration or listing. To the Company's knowledge, it is in compliance in all material respects with all applicable listing requirements of NASDAQ.

(q) *Non-Contravention of Existing Instruments; No Further Authorizations or Approvals Required.* Neither the Company nor any of its subsidiaries is in violation of its charter or by-laws, partnership agreement or operating agreement or similar organizational documents, as applicable, or is in default (or, with the giving of notice or lapse of time, would be in default) ("**Default**") under any indenture, loan, credit agreement, note, lease, license agreement, contract, franchise or other instrument (including, without limitation, any pledge agreement, security agreement, mortgage or other instrument or agreement evidencing, guaranteeing, securing or relating to indebtedness) to which the Company or any of its subsidiaries is a party or by which it or any of them may be bound, or to which any of their respective properties or assets are subject (each, an "**Existing Instrument**"), except for such Defaults as could not reasonably be expected, individually or in the aggregate, to have a material adverse effect on the condition (financial or other), earnings, business, properties, operations or prospects of the Company and its subsidiaries, considered as one entity (a "**Material Adverse Effect**"). The Company's execution, delivery and performance of this Agreement, consummation of the transactions contemplated hereby and by the Registration Statement, the Time of Sale Prospectus and the Prospectus and the issuance and sale of the Offered Shares and compliance by the Company with the terms and provisions thereof (i) have been duly authorized by all necessary corporate action and will not result in any violation of the provisions of the charter or by-laws, partnership agreement or operating agreement or similar organizational documents, as applicable, of the Company or any subsidiary (ii) will not conflict with or constitute a breach of, or Default or a Debt Repayment Triggering Event (as defined below) under, or result in the creation or imposition of any lien, charge or encumbrance upon any property or assets of the Company or any of its subsidiaries pursuant to, or require the consent of any other party to, any Existing Instrument and (iii) will not result in any violation of any law, administrative regulation or administrative or court decree applicable to the Company or any of its subsidiaries, except, in the case of clause (ii), for such breaches or Defaults as could not be expected, individually or in the aggregate, to have a Material Adverse Effect.

(r) No consent, approval, authorization or other order of, or registration or filing with, any court or other governmental or regulatory authority or agency, is required for the Company's execution, delivery and performance of this Agreement and consummation of the transactions contemplated hereby and by the Registration Statement, the Time of Sale Prospectus and the Prospectus, except such as have been obtained or made by the Company and are in full force and effect under the Securities Act and such as may be required under applicable state securities or blue sky laws or Financial Industry Regulatory Authority, Inc. ("**FINRA**"). As used herein, a "**Debt Repayment Triggering Event**" means any event or condition which gives, or

with the giving of notice or lapse of time would give, the holder of any note, debenture or other evidence of indebtedness (or any person acting on such holder's behalf) the right to require the repurchase, redemption or repayment of all or a portion of such indebtedness by the Company or any of its subsidiaries.

(s) **Compliance with Laws.** The Company and its subsidiaries have been and are in compliance with all applicable laws, rules and regulations, except where failure to be so in compliance could not reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect.

(t) **No Material Actions or Proceedings.** There is no action, suit, proceeding, inquiry, or investigation brought by or before any governmental entity, now pending or, to the knowledge of the Company, threatened, against or affecting the Company or any of its subsidiaries, which could reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect or materially and adversely affect the consummation of the transaction contemplated by this Agreement or the performance by the Company of its obligations hereunder. No material labor dispute with the employees of the Company or any of its subsidiaries exists or, to the knowledge of the Company, is threatened or imminent.

(u) **Intellectual Property Rights.** The Company and its subsidiaries own, or have obtained valid and enforceable licenses for, the inventions, patent applications, patents, trademarks, trade names, service names, copyrights, trade secrets and other intellectual property described in the Registration Statement, the Time of Sale Prospectus and the Prospectus as being owned or licensed by them or which are reasonably necessary for the conduct of their respective businesses as currently conducted or as currently proposed to be conducted as disclosed in the Registration Statement, the Time of Sale Prospectus and the Prospectus (collectively, "**Intellectual Property**"). To the Company's knowledge: (i) there are no third parties who have rights to any Intellectual Property, except for rights retained by third-party licensors with respect to Intellectual Property as licensed to the Company or one or more of its subsidiaries; and (ii) there is no material infringement by third parties of any Intellectual Property. There is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others: (A) challenging the Company's rights in or to any Intellectual Property, and the Company is unaware of any facts which would form a reasonable basis for any such action, suit, proceeding or claim; (B) challenging the validity, enforceability or scope of any Intellectual Property (except in rejections of patent or trademark applications in the normal course of prosecution at the United States Patent and Trademark Office and equivalent foreign patent and trademark offices that would not, individually or in the aggregate, have a Material Adverse Effect), and the Company is unaware of any facts which would form a reasonable basis for any such action, suit, proceeding or claim; or (C) asserting that the Company or any of its subsidiaries infringes or otherwise violates, or would, upon the commercialization of any product or service described in the Registration Statement, the Time of Sale Prospectus or the Prospectus as under development, infringe or violate, any patent, trademark, trade name, service name, copyright, trade secret or other proprietary rights of others, and the Company is unaware of any facts which would form a reasonable basis for any such action, suit, proceeding or claim. The Company and its subsidiaries have complied in all material respects with the terms of each agreement pursuant to which Intellectual Property has been licensed to the Company or any subsidiary, and all such agreements are in full force and effect. The product candidates described in the Registration Statement, the Time of Sale Prospectus and the Prospectus as under development by the Company or any

subsidiary fall within the scope of the claims of one or more patents owned by, or licensed to, the Company or any subsidiary.

(v) All Necessary Permits, etc. The Company and its subsidiaries possess such valid and current certificates, authorizations or permits required by state, federal or foreign regulatory agencies or bodies to conduct their respective businesses as currently conducted and as described in the Registration Statement, the Time of Sale Prospectus or the Prospectus (“**Permits**”), except those Permits with respect to which the failure to so possess could not reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect. Neither the Company nor any of its subsidiaries is in violation of, or in default under, any of the Permits or has received any notice of proceedings relating to the revocation or modification of, or non-compliance with, any such Permit which, individually or in the aggregate with any other violations, defaults or proceedings, if the subject of an unfavorable decision, ruling or finding, could reasonably be expected to have a Material Adverse Effect.

(w) Title to Properties. Except as disclosed in the Registration Statement, the Time of Sale Prospectus and the Prospectus, the Company and its subsidiaries have good and marketable title to all of the real and personal property and other assets reflected as owned in the financial statements referred to in Section 1(j) above (or elsewhere in the Registration Statement, the Time of Sale Prospectus or the Prospectus), in each case free and clear of any security interests, mortgages, liens, encumbrances, equities, adverse claims and other defects, except such as do not materially and adversely affect the value of such property and assets and do not materially interfere with the use made or proposed to be made of such property and assets by the Company or any of its subsidiaries. The real property, improvements, equipment and personal property held under lease by the Company or any of its subsidiaries are held under valid and enforceable leases, with such exceptions as are not material and do not materially interfere with the use made or proposed to be made of such real property, improvements, equipment or personal property by the Company or such subsidiary.

(x) Tax Law Compliance. The Company and its subsidiaries have filed all necessary federal, state and foreign income and franchise tax returns or have properly requested extensions thereof and have paid all taxes required to be paid by any of them and, if due and payable, any related or similar assessment, fine or penalty levied against any of them except as may be being contested in good faith and by appropriate proceedings, and except for such exceptions as could not reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect. The Company has made adequate charges, accruals and reserves in the applicable financial statements referred to in Section 1(j) above in respect of all federal, state and foreign income and franchise taxes for all periods as to which the tax liability of the Company or any of its subsidiaries has not been finally determined.

(y) Insurance. Each of the Company and its subsidiaries maintain insurance policies in such amounts and with such deductibles and covering such risks as are adequate and customary for their businesses including, but not limited to, policies covering the Company and its subsidiaries for product liability claims and clinical trial liability claims. The Company does not believe that it or any of its subsidiaries 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 could not reasonably be expected to have a Material Adverse Effect. In the last three

years, neither the Company nor any of its subsidiaries has been denied any insurance coverage which it has sought or for which it has applied.

(z) Compliance with Environmental Laws. Except as could not reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect: (i) neither the Company nor any of its subsidiaries is in violation of any federal, state, local or foreign statute, law, rule, regulation, ordinance, code, policy or rule of common law or any judicial or administrative interpretation thereof, including any judicial or administrative order, consent, decree or judgment, relating to pollution or protection of human health, the environment (including, without limitation, ambient air, surface water, groundwater, land surface or subsurface strata) or wildlife, including, without limitation, laws and regulations relating to the release or threatened release of chemicals, pollutants, contaminants, wastes, toxic substances, hazardous substances, petroleum or petroleum products (collectively, “**Hazardous Materials**”) or to the manufacture, processing, distribution, use, treatment, storage, disposal, transport or handling of Hazardous Materials (collectively, “**Environmental Laws**”); (ii) the Company and its subsidiaries have all permits, authorizations and approvals required under any applicable Environmental Laws and are each in compliance with their requirements; (iii) there are no pending or, to the Company’s knowledge threatened administrative, regulatory or judicial actions, suits, demands, demand letters, claims, liens, notices of noncompliance or violation, investigation or proceedings relating to any Environmental Law against the Company or any of its subsidiaries and (iv) to the Company’s knowledge, there are no events or circumstances that could reasonably be expected to form the basis of an order for clean-up or remediation, or an action, suit or proceeding by any private party or governmental body or agency, against or affecting the Company or any of its subsidiaries relating to Hazardous Materials or any Environmental Laws.

(aa) ERISA Compliance. The Company and its subsidiaries and any “employee benefit plan” (as defined under the Employee Retirement Income Security Act of 1974, as amended, and the regulations and published interpretations thereunder (collectively, “**ERISA**”)) established or maintained by the Company, its subsidiaries or their “ERISA Affiliates” (as defined below) are in compliance in all material respects with ERISA. “**ERISA Affiliate**” means, with respect to the Company or any of its subsidiaries, any member of any group of organizations described in Sections 414(b), (c), (m) or (o) of the Internal Revenue Code of 1986, as amended, and the regulations and published interpretations thereunder (the “**Code**”) of which the Company or such subsidiary is a member. No “reportable event” (as defined under ERISA) has occurred or is reasonably expected to occur with respect to any “employee benefit plan” established or maintained by the Company, its subsidiaries or any of their ERISA Affiliates. No “employee benefit plan” established or maintained by the Company, its subsidiaries or any of their ERISA Affiliates, if such “employee benefit plan” were terminated, would have any “amount of unfunded benefit liabilities” (as defined under ERISA). Neither the Company, its subsidiaries nor any of their ERISA Affiliates has incurred or reasonably expects to incur any liability under (i) Title IV of ERISA with respect to termination of, or withdrawal from, any “employee benefit plan” or (ii) Sections 412, 4971, 4975 or 4980B of the Code. Each employee benefit plan established or maintained by the Company, its subsidiaries or any of their ERISA Affiliates that is intended to be qualified under Section 401(a) of the Code is so qualified and nothing has occurred, whether by action or failure to act, which would cause the loss of such qualification.

(bb) Company Not an “Investment Company.” The Company is not, and will not be, either after receipt of payment for the Offered Shares or after the application of the proceeds therefrom as described under “Use of Proceeds” in the Registration Statement, the Time of Sale

Prospectus or the Prospectus, required to register as an “investment company” under the Investment Company Act of 1940, as amended (the “**Investment Company Act**”).

(cc) No Price Stabilization or Manipulation; Compliance with Regulation M. Neither the Company nor any of its subsidiaries has taken, directly or indirectly, any action designed to or that might be reasonably expected to cause or result in stabilization or manipulation of the price of the Shares or of any “reference security” (as defined in Rule 100 of Regulation M under the Exchange Act (“**Regulation M**”)) with respect to the Shares, whether to facilitate the sale or resale of the Offered Shares or otherwise, and has taken no action which would directly or indirectly violate Regulation M.

(dd) Related-Party Transactions. There are no business relationships or related-party transactions involving the Company or any of its subsidiaries or any other person required to be described in the Registration Statement, the Time of Sale Prospectus or the Prospectus that have not been described as required.

(ee) FINRA Matters. All of the information provided to the Underwriters or to counsel for the Underwriters by the Company, its counsel, its officers and directors and the holders of any securities (debt or equity) or options to acquire any securities of the Company in connection with the compliance of the offering of the Offered Shares with the rules of FINRA is true, complete and correct. The Company has been subject to the requirements of Section 12 or 15(d) of the Exchange Act as evident in the Company’s SEC filings, and has filed all materials required to be filed pursuant to Section 13, 14 or 15(d) of that Act, for a period of at least 36 calendar months immediately preceding the date hereof. The Company meets the requirements for offerings of securities registered with the SEC on registration statement Forms S-3 or F-3 pursuant to the standards for those Forms prior to October 21, 1992 and offered pursuant to Rule 415 of SEC Regulation C.

(ff) Statistical and Market-Related Data. All statistical, demographic and market-related data included in the Registration Statement, the Time of Sale Prospectus or the Prospectus are based on or derived from sources that the Company believes to be reliable and accurate. To the extent required, the Company has obtained the written consent to the use of such data from such sources.

(gg) No Unlawful Contributions or Other Payments. Neither the Company nor any of its subsidiaries nor, to the Company’s knowledge, any employee or agent of the Company or any subsidiary, has made any contribution or other payment to any official of, or candidate for, any federal, state or foreign office in violation of any law or of the character required to be disclosed in the Registration Statement, the Time of Sale Prospectus or the Prospectus.

(hh) Foreign Corrupt Practices Act. Neither the Company nor any of its subsidiaries nor, to the knowledge of the Company, any director, officer, agent, employee, affiliate or other person acting on behalf of the Company or any of its subsidiaries is aware of or has taken any action, directly or indirectly, that has resulted or would result in a violation of the Foreign Corrupt Practices Act of 1977, as amended, and the rules and regulations thereunder (the “**FCPA**”), including, without limitation, making use of the mails or any means or instrumentality of interstate commerce corruptly in furtherance of an offer, payment, promise to pay or authorization of the payment of any money, or other property, gift, promise to give, or authorization of the giving of anything of value to any “foreign official” (as such term is defined in the FCPA) or any

foreign political party or official thereof or any candidate for foreign political office, in contravention of the FCPA; and the Company and its subsidiaries and, to the knowledge of the Company, the Company's affiliates have conducted their respective businesses in compliance with the FCPA and have instituted and maintain policies and procedures designed to ensure, and which are reasonably expected to continue to ensure, continued compliance therewith.

(ii) Money Laundering Laws. The operations of the Company and its subsidiaries are, and have been conducted at all times, in compliance 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 applicable 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 involving the Company or any of its subsidiaries with respect to the Money Laundering Laws is pending or, to the best knowledge of the Company, threatened.

(jj) OFAC. Neither the Company nor any of its subsidiaries nor, to the knowledge of the Company, any director, officer, agent, employee, affiliate or person acting on behalf of the Company or any of its subsidiaries 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 this offering, or lend, contribute or otherwise make available such proceeds to any subsidiary, or any joint venture partner or other person or entity, for the purpose of financing the activities of any person known to the Company, after reasonable investigation, to be currently subject to any U.S. sanctions administered by OFAC.

(kk) Brokers. Except pursuant to this Agreement or as described in the Registration Statement, the Time of Sale Prospectus and the Prospectus, there is no broker, finder or other party that is entitled to receive from the Company any brokerage or finder's fee or other fee or commission as a result of any transactions contemplated by this Agreement.

(ll) Forward-Looking Statements. Each financial or operational projection or other "forward-looking statement" (as defined by Section 27A of the Securities Act or Section 21E of the Exchange Act) contained in the Registration Statement, the Time of Sale Prospectus or the Prospectus (i) was so included by the Company in good faith and with reasonable basis after due consideration by the Company of the underlying assumptions, estimates and other applicable facts and circumstances and (ii) is accompanied by meaningful cautionary statements identifying those factors that could cause actual results to differ materially from those in such forward-looking statement. No such statement was made with the knowledge of an executive officer or director of the Company that is was false or misleading.

(mm) Clinical Data and Regulatory Compliance. The preclinical tests and clinical trials that are described in, or the results of which are referred to in, the Registration Statement, the Time of Sale Prospectus or the Prospectus were and, if still pending, are being conducted in all material respects in accordance with protocols, procedures and controls filed with the appropriate regulatory authorities for each such test or trial, as the case may be, and with standard medical and scientific research procedures; each description of the results of such tests and trials contained in the Registration Statement, the Time of Sale Prospectus or the Prospectus is accurate and complete in all material respects and fairly presents in all material respects the data derived from such tests and trials, and the Company and its subsidiaries have no knowledge of any other

studies or tests the results of which are inconsistent with, or otherwise call into question, the results described or referred to in the Registration Statement, the Time of Sale Prospectuses or the Prospectus; neither the Company nor any of its subsidiaries has received any notices or other correspondence from the Food and Drug Administration of the U.S. Department of Health and Human Services or any committee thereof or from any other U.S. or foreign government or drug or medical device regulatory agency (collectively, the “**Regulatory Agencies**”) requiring the termination, suspension or modification of any clinical trials that are described or referred to in the Registration Statement, the Time of Sale Prospectus or the Prospectus; and the Company and its subsidiaries have each operated and currently are in compliance in all material respects with all applicable rules, regulations and policies of the Regulatory Agencies.

(nn) No Rights to Purchase Stock. The issuance and sale of the Offered Shares as contemplated hereby will not cause any holder of any shares of capital stock, securities convertible into or exchangeable or exercisable for capital stock or options, warrants or other rights to purchase capital stock or any other securities of the Company to have any right to acquire any shares of preferred stock of the Company.

(oo) No Contract Terminations. Except any communication regarding such termination or non-renewal that would not reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect, neither the Company nor any of its subsidiaries has sent or received any communication regarding termination of, or intent not to renew, any of the contracts or agreements referred to or described in any preliminary prospectus, the Prospectus or any free writing prospectus, or referred to or described in, or filed as an exhibit to, the Registration Statement, or any document incorporated by reference therein, and no such termination or non-renewal has been threatened by the Company or any of its subsidiaries or, to the Company’s knowledge, any other party to any such contract or agreement, which threat of termination or non-renewal has not been rescinded as of the date hereof.

(pp) Merger. All Merger Documents relating to the Merger required to be filed have been filed or will be filed before the First Closing Date. The Merger has become effective under the Delaware General Corporation Law. The delisting of the Shares from the Borsa Italiana S.p.A. has become effective.

Any certificate signed by any officer of the Company or any of its subsidiaries and delivered to any Underwriter or to counsel for the Underwriters in connection with the offering, or the purchase and sale, of the Offered Shares shall be deemed a representation and warranty by the Company to each Underwriter as to the matters covered thereby.

The Company has a reasonable basis for making each of the representations set forth in this Section 1. The Company acknowledges that the Underwriters and, for purposes of the opinions to be delivered pursuant to Section 6 hereof, counsel to the Company and counsel to the Underwriters, will rely upon the accuracy and truthfulness of the foregoing representations and hereby consents to such reliance.

Section 2. Purchase, Sale and Delivery of the Offered Shares.

(a) The Firm Shares. Upon the terms herein set forth, the Company agrees to issue and sell to the several Underwriters an aggregate of 20,000,000 Firm Shares. On the basis of the representations, warranties and agreements herein contained, and upon the terms but subject to the conditions herein set forth, the Underwriters agree, severally and not jointly, to purchase from

the Company, the respective number of Firm Shares set forth opposite their names on Schedule A. The purchase price per Firm Share to be paid by the several Underwriters to the Company shall be \$2.82 per share.

(b) The First Closing Date. Delivery of certificates for the Firm Shares to be purchased by the Underwriters and payment therefor shall be made at the offices of Covington & Burling LLP (or such other place as may be agreed to by the Company and the Representative) at 9:00 a.m. New York City time, on February 13, 2018, or such other time and date not later than 1:30 p.m. New York City time, on February 15, 2018 as the Representative shall designate by notice to the Company (the time and date of such closing are called the “**First Closing Date**”). The Company hereby acknowledges that circumstances under which the Representative may provide notice to postpone the First Closing Date as originally scheduled include, but are not limited to, any determination by the Company or the Representative to recirculate to the public copies of an amended or supplemented Prospectus or a delay as contemplated by the provisions of Section 11.

(c) The Optional Shares; Option Closing Date. In addition, on the basis of the representations, warranties and agreements herein contained, and upon the terms but subject to the conditions herein set forth, the Company hereby grants an option to the several Underwriters to purchase, severally and not jointly, up to an aggregate of 3,000,000 Optional Shares from the Company at the purchase price per share to be paid by the Underwriters for the Firm Shares, less an amount per share equal to any dividend or distribution declared by the Company and payable on the Firm Shares but not payable on Optional Shares. The option granted hereunder may be exercised at any time and from time to time in whole or in part upon notice by the Representative to the Company, which notice may be given at any time within 30 days from the date of this Agreement. Such notice shall set forth (i) the aggregate number of Optional Shares as to which the Underwriters are exercising the option and (ii) the time, date and place at which certificates for the Optional Shares will be delivered (which time and date may be simultaneous with, but not earlier than, the First Closing Date; and in the event that such time and date are simultaneous with the First Closing Date, the term “**First Closing Date**” shall refer to the time and date of delivery of certificates for the Firm Shares and such Optional Shares). Any such time and date of delivery, if subsequent to the First Closing Date, is called an “**Option Closing Date**,” shall be determined by the Representative and shall not be earlier than three or later than five full business days after delivery of such notice of exercise. If any Optional Shares are to be purchased, each Underwriter agrees, severally and not jointly, to purchase the number of Optional Shares (subject to such adjustments to eliminate fractional shares as the Representative may determine) that bears the same proportion to the total number of Optional Shares to be purchased as the number of Firm Shares set forth on Schedule A opposite the name of such Underwriter bears to the total number of Firm Shares agrees, severally and not jointly, to sell the number of Optional Shares to be sold by the Company as set forth in the paragraph “Introductory” of this Agreement). The Representative may cancel the option at any time prior to its expiration by giving written notice of such cancellation to the Company.

(d) Public Offering of the Offered Shares. The Representative hereby advises the Company that the Underwriters intend to offer for sale to the public, initially on the terms set forth in the Registration Statement, the Time of Sale Prospectus and the Prospectus, their respective portions of the Offered Shares as soon after this Agreement has been executed as the Representative, in its sole judgment, has determined is advisable and practicable.

(e) *Payment for the Offered Shares.*

(i) Payment for the Offered Shares to be sold by the Company shall be made at the First Closing Date (and, if applicable, at each Option Closing Date) by wire transfer of immediately available funds to the order of the Company.

(ii) It is understood that the Representative has been authorized, for its own account and the accounts of the several Underwriters, to accept delivery of and receipt for, and make payment of the purchase price for, the Firm Shares and any Optional Shares the Underwriters have agreed to purchase. Leerink, individually and not as the Representative of the Underwriters, may (but shall not be obligated to) make payment for any Offered Shares to be purchased by any Underwriter whose funds shall not have been received by the Representative by the First Closing Date or the applicable Option Closing Date, as the case may be, for the account of such Underwriter, but any such payment shall not relieve such Underwriter from any of its obligations under this Agreement.

(f) *Delivery of the Offered Shares.* The Company shall deliver, or cause to be delivered to the Representative for the accounts of the several Underwriters certificates for the Firm Shares at the First Closing Date, against release of a wire transfer of immediately available funds for the amount of the purchase price therefor. The Company shall also deliver, or cause to be delivered to the Representative for the accounts of the several Underwriters, certificates for the Optional Shares the Underwriters have agreed to purchase at the First Closing Date or the applicable Option Closing Date, as the case may be, against the release of a wire transfer of immediately available funds for the amount of the purchase price therefor. The certificates for the Offered Shares shall be registered in such names and denominations as the Representative shall have requested at least two full business days prior to the First Closing Date (or the applicable Option Closing Date, as the case may be) and shall be made available for inspection on the business day preceding the First Closing Date (or the applicable Option Closing Date, as the case may be) at a location in New York City as the Representative may designate. Time shall be of the essence, and delivery at the time and place specified in this Agreement is a further condition to the obligations of the Underwriters.

Section 3. Additional Covenants.

Covenants of the Company. The Company further covenants and agrees with each Underwriter as follows:

(a) *Delivery of Registration Statement, Time of Sale Prospectus and Prospectus.* The Company shall furnish to you in New York City, without charge, prior to 10:00 a.m. New York City time on the business day next succeeding the date of this Agreement and during the period when a prospectus is required by the Securities Act to be delivered (whether physically or through compliance with Rule 172 under the Securities Act or any similar rule) in connection with sales of the Offered Shares, as many copies of the Time of Sale Prospectus, the Prospectus and any supplements and amendments thereto or to the Registration Statement as you may reasonably request.

(b) *Representative's Review of Proposed Amendments and Supplements.* During the period when a prospectus is required by the Securities Act to be delivered (whether physically or through compliance with Rule 172 under the Securities Act or any similar rule), the Company (i) will furnish to the Representative for review, a reasonable period of time prior to the proposed

time of filing of any proposed amendment or supplement to the Registration Statement, a copy of each such amendment or supplement and (ii) will not amend or supplement the Registration Statement (including any amendment or supplement through incorporation of any report filed under the Exchange Act) without the Representative's prior written consent, which shall not be unreasonably withheld. During the period when a prospectus relating to the Offered Shares is required by the Securities Act to be delivered (whether physically or through compliance with Rule 172 under the Securities Act or any similar rule), prior to amending or supplementing, any preliminary prospectus, the Time of Sale Prospectus or the Prospectus (including any amendment or supplement through incorporation of any report filed under the Exchange Act), the Company shall furnish to the Representative for review, a reasonable amount of time prior to the time of filing or use of the proposed amendment or supplement, a copy of each such proposed amendment or supplement. The Company shall not file or use any such proposed amendment or supplement without the Representative's prior written consent. The Company shall file with the Commission within the applicable period specified in Rule 424(b) under the Securities Act any prospectus required to be filed pursuant to such Rule.

(c) Free Writing Prospectuses. The Company shall furnish to the Representative for review, a reasonable amount of time prior to the proposed time of filing or use thereof, a copy of each proposed free writing prospectus or any amendment or supplement thereto to be prepared by or on behalf of, used by, or referred to by the Company in connection with the Offered Shares, and the Company shall not file, use or refer to any proposed free writing prospectus or any amendment or supplement thereto in connection with the Offered Shares without the Representative's prior written consent, which shall not be unreasonably withheld. The Company shall furnish to each Underwriter, without charge, as many copies of any free writing prospectus in connection with the Offered Shares prepared by or on behalf of, or used by the Company, as such Underwriter may reasonably request. If at any time when a prospectus is required by the Securities Act to be delivered (whether physically or through compliance with Rule 172 under the Securities Act or any similar rule) in connection with sales of the Offered Shares (but in any event if at any time through and including the First Closing Date) there occurred or occurs an event or development as a result of which any free writing prospectus prepared by or on behalf of, used by, or referred to by the Company conflicted or would conflict with the information contained in the Registration Statement or included or would include an untrue statement of a material fact or omitted or would omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances prevailing at such time, not misleading, the Company shall promptly amend or supplement such free writing prospectus to eliminate or correct such conflict so that the statements in such free writing prospectus as so amended or supplemented will not include an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances prevailing at such time, not misleading, as the case may be; provided, however, that prior to amending or supplementing any such free writing prospectus, the Company shall furnish to the Representative for review, a reasonable amount of time prior to the proposed time of filing or use thereof, a copy of such proposed amended or supplemented free writing prospectus, and the Company shall not file, use or refer to any such amended or supplemented free writing prospectus without the Representative's prior written consent, which shall not be unreasonably withheld.

(d) Filing of Underwriter Free Writing Prospectuses. The Company shall not take any action that would result in an Underwriter or the Company being required to file with the Commission pursuant to Rule 433(d) under the Securities Act a free writing prospectus prepared

by or on behalf of the Underwriter that the Underwriter otherwise would not have been required to file thereunder.

(e) Amendments and Supplements to Time of Sale Prospectus. If the Time of Sale Prospectus is being used to solicit offers to buy the Offered Shares at a time when the Prospectus is not yet available to prospective purchasers, and any event shall occur or condition exist as a result of which it is necessary to amend or supplement the Time of Sale Prospectus so that the Time of Sale Prospectus does not include an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances when delivered to a prospective purchaser, not misleading, or if any event shall occur or condition exist as a result of which the Time of Sale Prospectus conflicts with the information contained in the Registration Statement, or if, in the opinion of counsel for the Underwriters, it is necessary to amend or supplement the Time of Sale Prospectus to comply with applicable law, the Company shall (subject to Section 3(b) and Section 3(c) hereof) promptly prepare, file with the Commission and furnish, at its own expense, to the Underwriters and to any dealer upon request, either amendments or supplements to the Time of Sale Prospectus so that the statements in the Time of Sale Prospectus as so amended or supplemented will not include an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances when delivered to a prospective purchaser, not misleading or so that the Time of Sale Prospectus, as amended or supplemented, will no longer conflict with the information contained in the Registration Statement, or so that the Time of Sale Prospectus, as amended or supplemented, will comply with applicable law.

(f) Certain Notifications and Required Actions. After the date of this Agreement, the Company shall promptly advise the Representative in writing of: (i) the receipt of any comments of, or requests for additional or supplemental information from, the Commission, to the extent such comments or requests are related to the offering and sale of the Offered Shares; (ii) the time and date of any filing of any post-effective amendment to the Registration Statement or any amendment or supplement to any preliminary prospectus, the Time of Sale Prospectus, any free writing prospectus or the Prospectus; (iii) the time and date that any post-effective amendment to the Registration Statement becomes effective; and (iv) the issuance by the Commission of any stop order suspending the effectiveness of the Registration Statement or any post-effective amendment thereto or any amendment or supplement to any preliminary prospectus, the Time of Sale Prospectus or the Prospectus or of any order preventing or suspending the use of any preliminary prospectus, the Time of Sale Prospectus, any free writing prospectus or the Prospectus, or of any proceedings to remove, suspend or terminate from listing or quotation the Shares from any securities exchange upon which they are listed for trading or included or designated for quotation, or of the threatening or initiation of any proceedings for any of such purposes. If the Commission shall enter any such stop order at any time, the Company will use its best efforts to obtain the lifting of such order at the earliest possible moment. Additionally, the Company agrees that it shall comply with all applicable provisions of Rule 424(b), Rule 433 and Rule 430B under the Securities Act and will use its reasonable efforts to confirm that any filings made by the Company under Rule 424(b) or Rule 433 were received in a timely manner by the Commission.

(g) Amendments and Supplements to the Prospectus and Other Securities Act Matters. If any event shall occur or condition exist as a result of which it is necessary to amend or supplement the Prospectus so that the Prospectus does not include an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in

the light of the circumstances when the Prospectus is delivered (whether physically or through compliance with Rule 172 under the Securities Act or any similar rule) to a purchaser, not misleading, or if in the opinion of the Representative or counsel for the Underwriters it is otherwise necessary to amend or supplement the Prospectus to comply with applicable law, the Company agrees (subject to Section 3(b) and Section 3(c)) hereof to promptly prepare, file with the Commission and furnish, at its own expense, to the Underwriters and to any dealer upon request, amendments or supplements to the Prospectus so that the statements in the Prospectus as so amended or supplemented will not include an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances when the Prospectus is delivered (whether physically or through compliance with Rule 172 under the Securities Act or any similar rule) to a purchaser, not misleading or so that the Prospectus, as amended or supplemented, will comply with applicable law. Neither the Representative's consent to, nor delivery of, any such amendment or supplement shall constitute a waiver of any of the Company's obligations under Section 3(b) or Section 3(c).

(h) *Blue Sky Compliance.* The Company shall cooperate with the Representative and counsel for the Underwriters to qualify or register the Shares for sale, and the determination of their eligibility for investment, under (or obtain exemptions from the application of) the state securities or blue sky laws or Canadian provincial securities laws (or other foreign laws) of those jurisdictions designated by the Representative, shall comply with such laws and shall continue such qualifications, registrations and exemptions in effect so long as required for the distribution of the Offered Shares. The Company shall not be required to qualify as a foreign corporation or to take any action that would subject it to general service of process in any such jurisdiction where it is not presently qualified or where it would be subject to taxation as a foreign corporation. The Company will advise the Representative promptly of the suspension of the qualification or registration of (or any such exemption relating to) the Shares for offering, sale or trading in any jurisdiction or any initiation or threat of any proceeding for any such purpose, and in the event of the issuance of any order suspending such qualification, registration or exemption, the Company shall use its best efforts to obtain the withdrawal thereof at the earliest possible moment.

(i) *Use of Proceeds.* The Company shall apply the net proceeds from the sale of the Offered Shares sold by it in the manner described under the caption "Use of Proceeds" in the Registration Statement, the Time of Sale Prospectus and the Prospectus.

(j) *Transfer Agent.* The Company shall engage and maintain, at its expense, a registrar and transfer agent for the Shares.

(k) *Earnings Statement.* The Company will make generally available to its security holders and to the Representative as soon as practicable an earnings statement (which need not be audited) covering a period of at least twelve months beginning with the first fiscal quarter of the Company commencing after the date of this Agreement that will satisfy the provisions of Section 11(a) of the Securities Act and the rules and regulations of the Commission thereunder.

(l) *Continued Compliance with Securities Laws.* The Company will comply with the Securities Act and the Exchange Act so as to permit the completion of the distribution of the Offered Shares as contemplated by this Agreement, the Registration Statement, the Time of Sale Prospectus and the Prospectus. Without limiting the generality of the foregoing, the Company will, during the period when a prospectus relating to the Offered Shares is required by the

Securities Act to be delivered (whether physically or through compliance with Rule 172 under the Securities Act or any similar rule), file on a timely basis with the Commission and the NASDAQ all reports and documents required to be filed under the Exchange Act.

(m) Listing. The Company will use its best efforts to list, subject to notice of issuance, the Offered Shares on the NASDAQ.

(n) Company to Provide Copy of the Prospectus in Form That May be Downloaded from the Internet. If requested by the Representative, the Company shall cause to be prepared and delivered, at its expense, within one business day from the effective date of this Agreement, to the Representative an “**electronic Prospectus**” to be used by the Underwriters in connection with the offering and sale of the Offered Shares. As used herein, the term “**electronic Prospectus**” means a form of Time of Sale Prospectus, and any amendment or supplement thereto, that meets each of the following conditions: (i) it shall be encoded in an electronic format, satisfactory to Leerink, that may be transmitted electronically by Leerink and the other Underwriters to offerees and purchasers of the Offered Shares; (ii) it shall disclose the same information as the paper Time of Sale Prospectus, except to the extent that graphic and image material cannot be disseminated electronically, in which case such graphic and image material shall be replaced in the electronic Prospectus with a fair and accurate narrative description or tabular representation of such material, as appropriate; and (iii) it shall be in or convertible into a paper format or an electronic format, satisfactory to Leerink, that will allow investors to store and have continuously ready access to the Time of Sale Prospectus at any future time, without charge to investors (other than any fee charged for subscription to the Internet as a whole and for on-line time). The Company hereby confirms that it has included or will include in the Prospectus filed pursuant to EDGAR or otherwise with the Commission and in the Registration Statement at the time it was declared effective an undertaking that, upon receipt of a request by an investor or his or her representative, the Company shall transmit or cause to be transmitted promptly, without charge, a paper copy of the Time of Sale Prospectus.

(o) Agreement Not to Offer or Sell Additional Shares. During the period commencing on and including the date hereof and continuing through and including the 90th day following the date of the Prospectus (such period, the “**Lock-up Period**”), the Company will not, without the prior written consent of Leerink (which consent may be withheld in its sole discretion), directly or indirectly: (i) sell, offer to sell, contract to sell or lend any Shares or Related Securities (as defined below); (ii) effect any short sale or establish or increase any “put equivalent position” (as defined in Rule 16a-1(h) under the Exchange Act) or liquidate or decrease any “call equivalent position” (as defined in Rule 16a-1(b) under the Exchange Act) of any Shares or Related Securities; (iii) pledge, hypothecate or grant any security interest in any Shares or Related Securities; (iv) in any other way transfer or dispose of Shares or Related Securities; (v) enter into any swap, hedge or similar arrangement or agreement that transfers, in whole or in part, the economic risk of ownership of any Shares or Related Securities, regardless of whether any such transaction is to be settled in securities, in cash or otherwise; (vi) announce the offering of any Shares or Related Securities; (vii) file any registration statement under the Securities Act in respect of any Shares or Related Securities (other than (A) as contemplated by this Agreement with respect to the Offered Shares and (B) the filing of, or amendment to, one or more registration statements on Form S-8); or (viii) publicly announce the intention to do any of the foregoing; *provided, however*, that the Company may (1) issue Shares or Related Securities upon exercise of options or upon distribution pursuant to restricted stock units, pursuant to any stock option, stock bonus or other stock plan or arrangement described in the Registration

Statement, the Time of Sale Prospectus and the Prospectus, provided that, in the case of grants of options or restricted stock units made after the date hereof and during the Lock-up Period, such grants shall provide that they shall not be exercisable or, in the case of restricted stock units, that the underlying shares shall not be distributed until after the expiration of the Lock-up Period without the prior written consent of Leerink (which consent may be withheld in its sole discretion); (2) issue any Shares or Related Securities pursuant to warrants or other outstanding rights as of the date hereof and described in the Registration Statement, the Time of Sale Prospectus and Prospectus and (3) issue any Shares or Related Securities in connection with strategic acquisitions and licensing arrangements or agreements; provided that, with respect to clause (3), the number of Shares or Related Securities, on a fully-diluted basis, shall not exceed 5% of the Shares outstanding on the date hereof. For purposes of the foregoing, “**Related Securities**” shall mean any options or warrants or other rights to acquire Shares or any securities exchangeable or exercisable for or convertible into Shares, or to acquire other securities or rights ultimately exchangeable or exercisable for, or convertible into, Shares.

(p) Future Reports to the Representative. During the period of five years hereafter, the Company will furnish to the Representative, c/o Leerink, at 299 Park Avenue, 21st Floor, New York, New York 10171, Attention: Global Head of Syndicate: (i) as soon as practicable after the end of each fiscal year, copies of the Annual Report of the Company containing the balance sheet of the Company as of the close of such fiscal year and statements of income, stockholders’ equity and cash flows for the year then ended and the opinion thereon of the Company’s independent public or certified public accountants; (ii) as soon as practicable after the filing thereof, copies of each proxy statement, Annual Report on Form 10-K, Quarterly Report on Form 10-Q, Current Report on Form 8-K or other report filed by the Company with the Commission or any securities exchange; and (iii) as soon as available, copies of any report or communication of the Company furnished or made available generally to holders of its capital stock (other than press releases made available to the public); *provided, however*, that the requirements of this Section 3(p) shall be satisfied to the extent that such reports, statement, communications, financial statements or other documents are available on EDGAR.

(q) Investment Limitation. The Company shall not invest or otherwise use the proceeds received by the Company from its sale of the Offered Shares in such a manner as would require the Company or any of its subsidiaries to register as an investment company under the Investment Company Act.

(r) No Stabilization or Manipulation; Compliance with Regulation M. The Company will not take, directly or indirectly, any action designed to or that might be reasonably expected to cause or result in stabilization or manipulation of the price of the Shares or any reference security (as such term is defined in Regulation M) with respect to the Shares, whether to facilitate the sale or resale of the Offered Shares or otherwise, and the Company will, and shall cause each of its affiliates to, comply with all applicable provisions of Regulation M.

(s) Enforce Lock-Up Agreements. During the Lock-up Period, the Company will enforce all agreements between the Company and any of its security holders that restrict or prohibit, expressly or in operation, the offer, sale or transfer of Shares or Related Securities or any of the other actions restricted or prohibited under the terms of the letter agreement furnished by the Company to the Underwriters in the form attached hereto as Exhibit B (the “**Lock-up Agreement**”). In addition, the Company will direct the transfer agent to place stop transfer restrictions upon any such securities of the Company that are bound by such “lock-up”

agreements for the duration of the periods contemplated in such agreements, including, without limitation, “lock-up” agreements entered into by the Company’s executive officers and directors pursuant to Section 6(l) hereof.

Section 4. Payment of Expenses. The Company agrees to pay all costs, fees and expenses incurred in connection with the performance of its obligations hereunder and in connection with the transactions contemplated hereby, including without limitation (i) all expenses incident to the issuance and delivery of the Offered Shares (including all printing and engraving costs), (ii) all fees and expenses of the registrar and transfer agent of the Shares, (iii) all necessary issue, transfer and other stamp taxes in connection with the issuance and sale of the Offered Shares to the Underwriters, (iv) all fees and expenses of the Company’s counsel, independent public or certified public accountants and other advisors, (v) all costs and expenses incurred in connection with the preparation, printing, filing, shipping and distribution of the Registration Statement (including financial statements, exhibits, schedules, consents and certificates of experts), the Time of Sale Prospectus, the Prospectus, each free writing prospectus prepared by or on behalf of, used by, or referred to by the Company, and each preliminary prospectus, and all amendments and supplements thereto, and this Agreement, (vi) all filing fees, attorneys’ fees and expenses incurred by the Company or the Underwriters in connection with qualifying or registering and the determination of the eligibility for investment of (or obtaining exemptions from the qualification or registration of) all or any part of the Offered Shares for offer and sale under the state securities or blue sky laws or the provincial securities laws of Canada, and, if requested by the Representative, preparing and printing a “Blue Sky Survey” or memorandum and a “Canadian wrapper”, and any supplements thereto, advising the Underwriters of such qualifications, registrations, determinations and exemptions, provided, however, that the Company shall not be responsible for any fees and expenses related to this clause in excess of \$20,000 in the aggregate pursuant to this subclause (vi), (vii) the costs, fees and expenses incurred by the Underwriters in connection with determining their compliance with the rules and regulations of FINRA related to the Underwriters’ participation in the offering and distribution of the Offered Shares, including any related filing fees and the legal fees of, and disbursements by, counsel to the Underwriters, provided, however, that the Company shall not be responsible for any fees or expenses related to this clause in excess of \$20,000 in the aggregate pursuant to this subclause (vii), (viii) the costs and expenses of the Company relating to investor presentations on any “road show” undertaken in connection with the offering of the Offered Shares, including, without limitation, expenses associated with the preparation or dissemination of any electronic road show, expenses associated with the production of road show slides and graphics, fees and expenses of any consultants engaged in connection with the road show presentations with the prior approval of the Company, travel and lodging expenses of the representatives, employees and officers of the Company and any such consultants, and the cost of any aircraft chartered by the Company or with the Company’s prior consent in connection with the road show, (ix) the fees and expenses associated with listing the Offered Shares on the NASDAQ, and (x) all other fees, costs and expenses of the Company of the nature referred to in Item 14 of Part II of the Registration Statement. Except as provided in this Section 4 or in Section 7, Section 9 or Section 10 hereof, the Underwriters shall pay their own expenses, including the fees and disbursements of their counsel.

Section 5. Covenant of the Underwriters. Each Underwriter severally and not jointly covenants with the Company not to take any action that would result in the Company being required to file with the Commission pursuant to Rule 433(d) under the Securities Act a free writing prospectus prepared by or on behalf of such Underwriter that

otherwise would not, but for such actions, be required to be filed by the Company under Rule 433(d).

Section 6. Conditions of the Obligations of the Underwriters. The respective obligations of the several Underwriters hereunder to purchase and pay for the Offered Shares as provided herein on the First Closing Date and, with respect to the Optional Shares, each Option Closing Date, shall be subject to the accuracy of the representations and warranties on the part of the Company set forth in Section 1 hereof as of the date hereof and as of the First Closing Date as though then made and, with respect to the Optional Shares, as of each Option Closing Date as though then made, to the timely performance by the Company of its covenants and other obligations hereunder, and to each of the following additional conditions:

(a) **Comfort Letter.** On the date hereof, the Representative shall have received from Marcum LLP, independent registered public accountants for the Company, a letter dated the date hereof addressed to the Underwriters, in form and substance reasonably satisfactory to the Representative, with executed copies for each of the other Underwriters named on the Prospectus cover page, containing statements and information of the type ordinarily included in accountant's "comfort letters" to underwriters, delivered according to Statement of Auditing Standards No. 72 (or any successor bulletin), with respect to the audited and unaudited financial statements and certain financial information contained in the Registration Statement, the Time of Sale Prospectus, and each free writing prospectus, if any.

(b) **Compliance with Registration Requirements; No Stop Order; No Objection from FINRA.**

(i) The Company shall have filed the Prospectus with the Commission (including the information previously omitted from the Registration Statement pursuant to Rule 430B under the Securities Act) in the manner and within the time period required by Rule 424(b) under the Securities Act; or the Company shall have filed a post-effective amendment to the Registration Statement containing the information previously omitted pursuant to such Rule 430B, and such post-effective amendment shall have become effective.

(ii) No stop order suspending the effectiveness of the Registration Statement or any post-effective amendment to the Registration Statement shall be in effect, and no proceedings for such purpose shall have been instituted or threatened by the Commission.

(iii) If a filing has been made with FINRA, FINRA shall have raised no objection to the fairness and reasonableness of the underwriting terms and arrangements.

(c) **No Material Adverse Change or Ratings Agency Change.** For the period from and after the date of this Agreement and through and including the First Closing Date and, with respect to any Optional Shares purchased after the First Closing Date, each Option Closing Date:

(i) in the reasonable judgment of the Representative there shall not have occurred any Material Adverse Change; and

(ii) there shall not have occurred any downgrading, nor shall any notice have been given of any intended or potential downgrading or of any review for a possible change that does not indicate the direction of the possible change, in the rating accorded

any securities of the Company or any of its subsidiaries by any “nationally recognized statistical rating organization” as such term is defined for purposes of Section 3(a)(62) of the Exchange Act.

(d) *Opinion of Counsel for the Company.* On each of the First Closing Date and each Option Closing Date, the Representative shall have received the opinion of O’Melveny & Myers LLP, counsel for the Company, dated as of such date, in form and substance reasonably satisfactory to counsel for the Underwriters, with executed copies for each of the other Underwriters named on the Prospectus cover page.

(e) *Opinion of Patent Counsel for the Company.* On each of the First Closing Date and each Option Closing Date, the Representative shall have received the opinion of Phillips Ormond Fitzpatrick, special patent counsel for the Company with respect to intellectual property matters, dated as of such date, in the form attached hereto as Exhibit A-1, with executed copies for each of the other Underwriters named on the Prospectus cover page.

(f) *Opinion of Patent Counsel for the Company.* On each of the First Closing Date and each Option Closing Date, the Representative shall have received the opinion of Seed Intellectual Property Law Group PLLC, special patent counsel for the Company with respect to intellectual property matters, dated as of such date, in the form attached hereto as Exhibit A-2, with executed copies for each of the other Underwriters named on the Prospectus cover page.

(g) *Opinion of Counsel for the Underwriters.* On each of the First Closing Date and each Option Closing Date, the Representative shall have received the opinion of Covington & Burling LLP, counsel for the Underwriters in connection with the offer and sale of the Offered Shares, in form and substance reasonably satisfactory to the Underwriters, dated as of such date, with executed copies for each of the other Underwriters named on the Prospectus cover page.

(h) *Officers’ Certificate.* On each of the First Closing Date and each Option Closing Date, the Representative shall have received a certificate executed by the Chief Executive Officer or President of the Company and the Chief Financial Officer of the Company, dated as of such date, with executed copies for each of the other Underwriters named on the Prospectus cover page, to the effect set forth in Section 6(b)(ii) and Section 6(c)(ii) and further to the effect that:

(i) for the period from and including the date of this Agreement through and including such date, there has not occurred any Material Adverse Change;

(ii) the representations and warranties of the Company set forth in Section 1 of this Agreement that are qualified as to materiality or Material Adverse Effect are true and correct and the representations and warranties of the Company set forth in Section 1 of this Agreement that are not so qualified are true and correct in all material respects; and

(iii) the Company has complied in all material respects with all the agreements hereunder and satisfied all the conditions on its part to be performed or satisfied hereunder at or prior to such date.

(i) *Regulatory Affairs Certificate.* On each of the First Closing Date and each Option Closing Date, the Representative shall have received a certificate from the director of regulatory affairs for the Company with respect to regulatory matters, in such person’s capacity as

an employee of the Company, dated as of such date, with executed copies for each of the other Underwriters named on the Prospectus cover page.

(j) **Intellectual Property Certificate.** On each of the First Closing Date and each Option Closing Date, the Representative shall have received a certificate from a senior counsel for the Company with respect to intellectual property matters, in such person's capacity as an employee of the Company, dated as of such date, with executed copies for each of the other Underwriters named on the Prospectus cover page.

(k) **Bring-down Comfort Letter.** On each of the First Closing Date and each Option Closing Date, the Representative shall have received from Marcum LLP, independent registered public accountants for the Company, a letter dated such date, in form and substance satisfactory to the Representative, with executed copies for each of the other Underwriters named on the Prospectus cover page, which letter shall (i) reaffirm the statements made in the letter furnished by them pursuant to Section 6(a)(i), except that the specified date referred to therein for the carrying out of procedures shall be no more than three business days prior to the First Closing Date or the applicable Option Closing Date, as the case may be; and (ii) cover certain financial information contained in the Prospectus.

(l) **Lock-Up Agreements.** On or prior to the date hereof, the Company shall have furnished to the Representative an agreement in the form of Exhibit B hereto from each of the persons listed on Exhibit C hereto, and each such agreement shall be in full force and effect on each of the First Closing Date and each Option Closing Date (except to the extent the Representative has released any such persons from such agreements).

(m) **Officer's Certificate.** On each of the First Closing Date and each Option Closing Date, the Representative shall have received a certificate of the Executive Vice President, Chief Financial Officer of the Company, dated as of such date, certifying such matters as the Representative may reasonably request.

(n) **Additional Documents.** On or before each of the First Closing Date and each Option Closing Date, the Representative and counsel for the Underwriters shall have received such information, documents and opinions as they may reasonably request for the purposes of enabling them to pass upon the issuance and sale of the Offered Shares as contemplated herein, or in order to evidence the accuracy of any of the representations and warranties, or the satisfaction of any of the conditions or agreements, herein contained; and all proceedings taken by the Company in connection with the issuance and sale of the Offered Shares as contemplated herein and in connection with the other transactions contemplated by this Agreement shall be reasonably satisfactory in form and substance to the Representative and counsel for the Underwriters.

If any condition specified in this Section 6 is not satisfied when and as required to be satisfied, this Agreement may be terminated by the Representative by notice from Leerink to the Company at any time on or prior to the First Closing Date and, with respect to the Optional Shares, at any time on or prior to the applicable Option Closing Date, which termination shall be without liability on the part of any party to any other party, except that Section 4, Section 7, Section 9 and Section 10 shall at all times be effective and shall survive such termination.

Section 7. Reimbursement of Underwriters' Expenses. If this Agreement is terminated by the Representative pursuant to Section 6, Section 11 or Section 12, or if the sale to the Underwriters of the Offered Shares on the First Closing Date is not consummated because

of any refusal, inability or failure on the part of the Company to perform any agreement herein or to comply with any provision hereof, the Company agrees to reimburse the Representative and the other Underwriters (or such Underwriters as have terminated this Agreement with respect to themselves), severally, upon demand for all out-of-pocket documented expenses that shall have been reasonably incurred by the Representative and the Underwriters in connection with the proposed purchase and the offering and sale of the Offered Shares, including but not limited to fees and disbursements of counsel, printing expenses, travel expenses, postage, facsimile and telephone charges; *provided, however*, if this Agreement is terminated pursuant to Section 11 by reason of the default of one or more Underwriters, the Company shall not be obligated to reimburse any defaulting Underwriter on account of those expenses.

Section 8. Effectiveness of this Agreement. This Agreement shall become effective upon the execution and delivery hereof by the parties hereto.

Section 9. Indemnification.

(a) Indemnification of the Underwriters. The Company agrees to indemnify and hold harmless each Underwriter, its affiliates, directors, officers, employees and agents, and each person, if any, who controls any Underwriter within the meaning of the Securities Act or the Exchange Act against any loss, claim, damage, liability or expense, as incurred, to which such Underwriter or such affiliate, director, officer, employee, agent or controlling person may become subject, under the Securities Act, the Exchange Act, other federal or state statutory law or regulation, or the laws or regulations of foreign jurisdictions where Shares have been offered or sold or at common law or otherwise (including in settlement of any litigation, if such settlement is effected with the written consent of the Company), insofar as such loss, claim, damage, liability or expense (or actions in respect thereof as contemplated below) arises out of or is based upon (A) (i) any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, or any amendment thereto, or the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading; or (ii) any untrue statement or alleged untrue statement of a material fact included in any preliminary prospectus, the Time of Sale Prospectus, any free writing prospectus that the Company has used, referred to or filed, or is required to file, pursuant to Rule 433(d) of the Securities Act, or the Prospectus (or any amendment or supplement to the foregoing), or the omission or alleged omission to state therein a material fact necessary in order to make the statements, in the light of the circumstances under which they were made, not misleading; or (iii) any act or failure to act or any alleged act or failure to act by any Underwriter in connection with, or relating in any manner to, the Shares or the offering contemplated hereby, and which is included as part of or referred to in any loss, claim, damage, liability or action arising out of or based upon any matter covered by clause (i) or (ii) above, *provided, however*, that the Company shall not be liable under this clause (iii) to the extent that a court of competent jurisdiction shall have determined by a final judgment that such loss, claim, damage, liability or action resulted directly from any such acts or failures to act undertaken or omitted to be taken by the Underwriter through its bad faith or willful misconduct or (B) the violation of any laws or regulations of foreign jurisdictions where Shares have been offered or sold; and to reimburse each Underwriter and each such affiliate, director, officer, employee, agent and controlling person for any and all expenses (including the fees and disbursements of counsel) as such expenses are reasonably incurred by such Underwriter or such affiliate, director, officer, employee, agent or controlling person in connection with investigating, defending, settling, compromising or paying any such loss, claim, damage, liability, expense or action; *provided, however*, that the foregoing indemnity

agreement shall not apply to any loss, claim, damage, liability or expense to the extent, but only to the extent, arising out of or based upon any untrue statement or alleged untrue statement or omission or alleged omission made in reliance upon and in conformity with information relating to any Underwriter furnished to the Company by the Representative in writing expressly for use in the Registration Statement, any preliminary prospectus, the Time of Sale Prospectus, any such free writing prospectus or the Prospectus (or any amendment or supplement thereto), it being understood and agreed that the only such information consists of the information described in Section 9(b) below. The indemnity agreement set forth in this Section 9(a) shall be in addition to any liabilities that the Company may otherwise have.

(b) *Indemnification of the Company, its Directors and Officers.* Each Underwriter agrees, severally and not jointly, to indemnify and hold harmless the Company, each of its directors, each of its officers who signed the Registration Statement and each person, if any, who controls the Company within the meaning of the Securities Act or the Exchange Act, against any loss, claim, damage, liability or expense, as incurred, to which the Company, or any such director, officer or controlling person may become subject, under the Securities Act, the Exchange Act, or other federal or state statutory law or regulation, or at common law or otherwise (including in settlement of any litigation, if such settlement is effected with the written consent of such Underwriter), insofar as such loss, claim, damage, liability or expense (or actions in respect thereof as contemplated below) arises out of or is based upon (i) any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, or any amendment thereto, or any omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading or (ii) any untrue statement or alleged untrue statement of a material fact included in any preliminary prospectus, the Time of Sale Prospectus, any free writing prospectus that the Company has used, referred to or filed, or is required to file, pursuant to Rule 433 of the Securities Act, or the Prospectus (or any such amendment or supplement) or the omission or alleged omission to state therein a material fact necessary in order to make the statements, in the light of the circumstances under which they were made, 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 the Registration Statement, such preliminary prospectus, the Time of Sale Prospectus, such free writing prospectus, the Prospectus (or any such amendment or supplement), in reliance upon and in conformity with information relating to such Underwriter furnished to the Company by the Representative in writing expressly for use therein; and to reimburse the Company, or any such director, officer or controlling person for any and all expenses (including the fees and disbursements of counsel) as such expenses are reasonably incurred by the Company, or any such director, officer or controlling person in connection with investigating, defending, settling, compromising or paying any such loss, claim, damage, liability, expense or action. The Company hereby acknowledges that the only information that the Representative has furnished to the Company expressly for use in the Registration Statement, any preliminary prospectus, the Time of Sale Prospectus, any free writing prospectus that the Company has filed, or is required to file, pursuant to Rule 433(d) of the Securities Act, or the Prospectus (or any amendment or supplement to the foregoing) are (i) the names of the underwriters as set forth under the caption “Underwriting” and on the cover page of the Time of Sale Prospectus and the Prospectus, (ii) the first three sentences of the first paragraph under the caption “Underwriting—Commissions and Expenses” in the Preliminary Prospectus Supplement and the Final Prospectus Supplement, (iii) the first sentence of the first paragraph under the caption “Underwriting—Other Activities and Relationships” in the Preliminary Prospectus Supplement and the Final Prospectus Supplement, and (iv) the second paragraph under the caption “Underwriting—Other Activities and

Relationships” in the Preliminary Prospectus Supplement and the Final Prospectus Supplement. The indemnity agreement set forth in this Section 9(b) shall be in addition to any liabilities that each Underwriter may otherwise have.

(c) *Notifications and Other Indemnification Procedures.* Promptly after receipt by an indemnified party under this Section 9 of notice of the commencement of any action, such indemnified party will, if a claim in respect thereof is to be made against an indemnifying party under this Section 9, notify the indemnifying party in writing of the commencement thereof, but the omission so to notify the indemnifying party will not relieve the indemnifying party from any liability which it may have to any indemnified party to the extent the indemnifying party is not materially prejudiced as a proximate result of such failure and shall not in any event relieve the indemnifying party from any liability that it may have otherwise than on account of this indemnity agreement. In case any such action is brought against any indemnified party and such indemnified party seeks or intends to seek indemnity from an indemnifying party, the indemnifying party will be entitled to participate in, and, to the extent that it shall elect, jointly with all other indemnifying parties similarly notified, by written notice delivered to the indemnified party promptly after receiving the aforesaid notice from such indemnified party, to assume the defense thereof with counsel reasonably satisfactory to such indemnified party; *provided, however*, that if the defendants in any such action include both the indemnified party and the indemnifying party and the indemnified party shall have reasonably concluded that a conflict may arise between the positions of the indemnifying party and the indemnified party in conducting the defense of any such action or that there may be legal defenses available to it and/or other indemnified parties which are different from or additional to those available to the indemnifying party, the indemnified party or parties shall have the right to select separate counsel to assume such legal defenses and to otherwise participate in the defense of such action on behalf of such indemnified party or parties. Upon receipt of notice from the indemnifying party to such indemnified party of such indemnifying party’s election so to assume the defense of such action and approval by the indemnified party of counsel, the indemnifying party will not be liable to such indemnified party under this Section 9 for any legal or other expenses subsequently incurred by such indemnified party in connection with the defense thereof unless (i) the indemnified party shall have employed separate counsel in accordance with the proviso to the preceding sentence (it being understood, however, that the indemnifying party shall not be liable for the fees and expenses of more than one separate counsel (together with local counsel), representing the indemnified parties who are parties to such action), which counsel (together with any local counsel) for the indemnified parties shall be selected by Leerink (in the case of counsel for the indemnified parties referred to in Section 9(a) above) or by the Company (in the case of counsel for the indemnified parties referred to in Section 9(b) above)) or (ii) the indemnifying party shall not have employed counsel reasonably satisfactory to the indemnified party to represent the indemnified party within a reasonable time after notice of commencement of the action or (iii) the indemnifying party has authorized in writing the employment of counsel for the indemnified party at the expense of the indemnifying party, in each of which cases the fees and expenses of counsel shall be at the expense of the indemnifying party and shall be paid as they are incurred.

(d) *Settlements.* The indemnifying party under this Section 9 shall not be liable for any settlement of any proceeding effected without its written consent, but if settled with such consent or if there be a final judgment for the plaintiff, the indemnifying party agrees to indemnify the indemnified party against any loss, claim, damage, liability or expense by reason of such settlement or judgment. Notwithstanding the foregoing sentence, if at any time an indemnified party shall have requested an indemnifying party to reimburse the indemnified party

for fees and expenses of counsel as contemplated by Section 9(c) hereof, the indemnifying party shall be liable for any settlement of any proceeding effected without its written consent if (i) such settlement is entered into more than 30 days after receipt by such indemnifying party of the aforesaid request and the indemnifying party has not objected to the terms of such settlement and (ii) such indemnifying party shall not have reimbursed the indemnified party all amounts reasonably owed in accordance with such request prior to the date of such settlement. No indemnifying party shall, without the prior written consent of the indemnified party, effect any settlement, compromise or consent to the entry of judgment in any pending or threatened action, suit or proceeding in respect of which any indemnified party is or could have been a party and indemnity was or could have been sought hereunder by such indemnified party, unless such settlement, compromise or consent includes an unconditional release of such indemnified party from all liability on claims that are the subject matter of such action, suit or proceeding and does not include an admission of fault or culpability or a failure to act by or on behalf of such indemnified party.

Section 10. Contribution. If the indemnification provided for in Section 9 is for any reason held to be unavailable to or otherwise insufficient to hold harmless an indemnified party in respect of any losses, claims, damages, liabilities or expenses referred to therein, then each indemnifying party shall contribute to the aggregate amount paid or payable by such indemnified party, as incurred, as a result of any losses, claims, damages, liabilities or expenses referred to therein (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 hand, from the offering of the Offered Shares pursuant to this Agreement 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 hand, in connection with the statements or omissions which resulted in such losses, claims, damages, liabilities or expenses, as well as any other relevant equitable considerations. The relative benefits received by the Company, on the one hand, and the Underwriters, on the other hand, in connection with the offering of the Offered Shares pursuant to this Agreement shall be deemed to be in the same respective proportions as the total proceeds from the offering of the Offered Shares pursuant to this Agreement (before deducting expenses) received by the Company, and the total underwriting discounts and commissions received by the Underwriters, in each case as set forth on the front cover page of the Prospectus, bear to the aggregate initial public offering price of the Offered Shares as set forth on such cover. The relative fault of the Company, on the one hand, and the Underwriters, on the other hand, shall be determined by reference to, among other things, whether any such untrue or alleged untrue statement of a material fact or omission or alleged omission to state a material fact relates to information supplied by the Company, on the one hand, or the Underwriters, on the other hand, and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission.

The amount paid or payable by a party as a result of the losses, claims, damages, liabilities and expenses referred to above shall be deemed to include, subject to the limitations set forth in Section 9(c), any legal or other fees or expenses reasonably incurred by such party in connection with investigating or defending any action or claim. The provisions set forth in Section 9(c) with respect to notice of commencement of any action shall apply if a claim for contribution is to be made under this Section 10; *provided, however*, that no additional notice shall be required with respect to any action for which notice has been given under Section 9(c) for purposes of indemnification.

The Company and the Underwriters agree that it would not be just and equitable if contribution pursuant to this Section 10 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 10.

Notwithstanding the provisions of this Section 10, no Underwriter shall be required to contribute any amount in excess of the underwriting discounts and commissions received by such Underwriter in connection with the Offered Shares underwritten by it and distributed to the public. 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 to contribute pursuant to this Section 10 are several, and not joint, in proportion to their respective underwriting commitments as set forth opposite their respective names on Schedule A. For purposes of this Section 10, each affiliate, director, officer, employee and agent of an Underwriter and each person, if any, who controls an Underwriter within the meaning of the Securities Act or the Exchange Act shall have the same rights to contribution as such Underwriter, and each director of the Company, each officer of the Company who signed the Registration Statement, and each person, if any, who controls the Company with the meaning of the Securities Act and the Exchange Act shall have the same rights to contribution as the Company.

Section 11. Default of One or More of the Several Underwriters. If, on the First Closing Date or any Option Closing Date any one or more of the several Underwriters shall fail or refuse to purchase Offered Shares that it or they have agreed to purchase hereunder on such date, and the aggregate number of Offered Shares which such defaulting Underwriter or Underwriters agreed but failed or refused to purchase does not exceed 10% of the aggregate number of the Offered Shares to be purchased on such date, the Representative may make arrangements satisfactory to the Company for the purchase of such Offered Shares by other persons, including any of the Underwriters, but if no such arrangements are made by such date, the other Underwriters shall be obligated, severally and not jointly, in the proportions that the number of Firm Shares set forth opposite their respective names on Schedule A bears to the aggregate number of Firm Shares set forth opposite the names of all such non-defaulting Underwriters, or in such other proportions as may be specified by the Representative with the consent of the non-defaulting Underwriters, to purchase the Offered Shares which such defaulting Underwriter or Underwriters agreed but failed or refused to purchase on such date. If, on the First Closing Date or any Option Closing Date any one or more of the Underwriters shall fail or refuse to purchase Offered Shares and the aggregate number of Offered Shares with respect to which such default occurs exceeds 10% of the aggregate number of Offered Shares to be purchased on such date, and arrangements satisfactory to the Representative and the Company for the purchase of such Offered Shares are not made within 48 hours after such default, this Agreement shall terminate without liability of any party to any other party except as set forth below and that the provisions of Section 4, Section 7, Section 9 and Section 10 shall at all times be effective and shall survive such termination. In any such case either the Representative or the Company shall have the right to postpone the First Closing Date or the applicable Option Closing Date, but in no event for longer than seven days in order that the required changes, if any, to the Registration Statement and the Prospectus or any other documents or arrangements may be effected.

As used in this Agreement, the term “**Underwriter**” shall be deemed to include any person substituted for a defaulting Underwriter under this Section 11. Any action taken under this

Section 11 shall not relieve any defaulting Underwriter from liability in respect of any default of such Underwriter under this Agreement.

Section 12. Termination of this Agreement. Prior to the purchase of the Firm Shares by the Underwriters on the First Closing Date, this Agreement may be terminated by Representative by notice given to the Company if at any time (i) trading or quotation in any of the Company's securities shall have been suspended or limited by the Commission or by the NASDAQ, or trading in securities generally on either the NASDAQ or the NYSE shall have been suspended or limited, or minimum or maximum prices shall have been generally established on any of such stock exchanges; (ii) a general banking moratorium shall have been declared by any U.S. federal, New York or Delaware authorities; (iii) there shall have occurred any outbreak or escalation of national or international hostilities or any crisis or calamity, or any change in the United States or international financial markets, or any substantial change or development involving a prospective substantial change in United States' or international political, financial or economic conditions, as in the judgment of Leerink is material and adverse and makes it impracticable to market the Offered Shares in the manner and on the terms described in the Time of Sale Prospectus or the Prospectus or to enforce contracts for the sale of securities; (iv) in the judgment of Leerink there shall have occurred any Material Adverse Change; (v) the Company shall have sustained a loss by strike, fire, flood, earthquake, accident or other calamity of such character as in the judgment of Leerink may interfere materially with the conduct of the business and operations of the Company regardless of whether or not such loss shall have been insured. Any termination pursuant to this Section 12 shall be without liability on the part of (a) the Company to any Underwriter, except that the Company shall be obligated to reimburse the expenses of the Representative and the Underwriters pursuant to Section 4 or Section 7 hereof or (b) any Underwriter to the Company; *provided, however,* that the provisions of Section 9 and Section 10 shall at all times be effective and shall survive such termination.

Section 13. No Advisory or Fiduciary Relationship. The Company acknowledges and agrees that (a) the purchase and sale of the Offered Shares to this Agreement, including the determination of the public offering price of the Offered Shares and any related discounts and commissions, is an arm's-length commercial transaction between the Company, on the one hand, and the several Underwriters, on the other hand, (b) in connection with the offering contemplated hereby and the process leading to such transaction, each Underwriter is and has been acting solely as a principal and is not the agent or fiduciary of the Company, or its stockholders, or its creditors, employees or any other party, (c) no Underwriter has assumed or will assume an advisory or fiduciary responsibility in favor of the Company with respect to the offering contemplated hereby or the process leading thereto (irrespective of whether such Underwriter has advised or is currently advising the Company on other matters) and no Underwriter has any obligation to the Company with respect to the offering contemplated hereby except the obligations expressly set forth in this Agreement, (d) the Underwriters and their respective affiliates may be engaged in a broad range of transactions that involve interests that differ from those of the Company, and (e) the Underwriters have not provided any legal, accounting, regulatory or tax advice with respect to the offering contemplated hereby and the Company has consulted its own legal, accounting, regulatory and tax advisors to the extent it deemed appropriate.

Section 14. Representations and Indemnities to Survive Delivery. The respective indemnities, agreements, representations, warranties and other statements of the Company, of 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 made by or on behalf of any Underwriter or the Company or any of its or their partners, officers or directors or any controlling person, as the case may be, and, anything herein to the contrary notwithstanding, will survive delivery of and payment for the Offered Shares sold hereunder and any termination of this Agreement.

Section 15. Notices. All communications hereunder shall be in writing and shall be mailed, hand delivered or sent by facsimile transmission and confirmed to the parties hereto as follows:

If to the Representative: Leerink Partners LLC
299 Park Avenue, 21st Floor
New York, New York 10171
Attention: General Counsel

with a copy to: Covington & Burling LLP
The New York Times Building
620 Eighth Avenue
New York, New York 10018

Facsimile: (212) 841-1010
Attention: Donald J. Murray, Esq.

If to the Company: CTI BioPharma Corp.
3101 Western Avenue, Suite 600
Seattle, Washington 98121

Facsimile: (206) 272-4302
Attention: Adam R. Craig, M.D., Ph.D.
Chief Executive Officer

with a copy to: O'Melveny & Myers LLP
Two Embarcadero Center, 28th Floor
San Francisco, CA 94111
Facsimile: (415) 984-8701
Attention: C. Brophy Christensen, Esq.
Eric Sibbitt, Esq.

Any party hereto may change the address for receipt of communications by giving written notice to the others.

Section 16. Successors. This Agreement will inure to the benefit of and be binding upon the parties hereto, including any substitute Underwriters pursuant to Section 11 hereof, and to the benefit of the affiliates, directors, officers, employees, agents and controlling persons referred to in Section 9 and Section 10, and in each case their respective successors, and no other person will have any right or obligation hereunder. The term “**successors**” shall not include any purchaser of the Offered Shares as such from any of the Underwriters merely by reason of such purchase.

Section 17. Partial Unenforceability. The invalidity or unenforceability of any section, paragraph or provision of this Agreement shall not affect the validity or

enforceability of any other section, paragraph or provision hereof. If any section, paragraph 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 it valid and enforceable.

Section 18. Governing Law Provisions. This Agreement shall be governed by and construed in accordance with the internal laws of the State of New York applicable to agreements made and to be performed in such state. Any legal suit, action or proceeding arising out of or based upon this Agreement or the transactions contemplated hereby (“**Related Proceedings**”) may be instituted in the federal courts of the United States of America located in the Borough of Manhattan in the City of New York or the courts of the State of New York in each case located in the Borough of Manhattan in the City of New York (collectively, the “**Specified Courts**”), and each party irrevocably submits to the exclusive jurisdiction (except for proceedings instituted in regard to the enforcement of a judgment of any such court (a “**Related Judgment**”), as to which such jurisdiction is non-exclusive) of such courts in any such suit, action or proceeding. Service of any process, summons, notice or document by mail to such party’s address set forth above shall be effective service of process for any suit, action or other proceeding brought in any such court. The parties irrevocably and unconditionally waive any objection to the laying of venue of any suit, action or other proceeding in the Specified Courts and irrevocably and unconditionally waive and agree not to plead or claim in any such court that any such suit, action or other proceeding brought in any such court has been brought in an inconvenient forum. Each party not located in the United States irrevocably appoints CT Corporation System, which currently maintains a New York City office at 111 Eighth Avenue, New York, New York 10011, United States of America, as its agent to receive service of process or other legal summons for purposes of any such suit, action or proceeding that may be instituted in any state or federal court in the Borough of Manhattan in the City of New York.

With respect to any Related Proceeding, each party irrevocably waives, to the fullest extent permitted by applicable law, all immunity (whether on the basis of sovereignty or otherwise) from jurisdiction, service of process, attachment (both before and after judgment) and execution to which it might otherwise be entitled in the Specified Courts, and with respect to any Related Judgment, each party waives any such immunity in the Specified Courts or any other court of competent jurisdiction, and will not raise or claim or cause to be pleaded any such immunity at or in respect of any such Related Proceeding or Related Judgment, including, without limitation, any immunity pursuant to the United States Foreign Sovereign Immunities Act of 1976, as amended.

Section 19. General Provisions. 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. This Agreement may be executed in two or more counterparts, each one of which shall be an original, with the same effect as if the signatures thereto and hereto were upon the same instrument. This Agreement may not be amended or modified unless in writing by all of the parties hereto, and no condition herein (express or implied) may be waived unless waived in writing by each party whom the condition is meant to benefit. The section headings herein are for the convenience of the parties only and shall not affect the construction or interpretation of this Agreement.

Each of the parties hereto acknowledges that it is a sophisticated business person who was adequately represented by counsel during negotiations regarding the provisions hereof, including, without limitation, the indemnification provisions of Section 9 and the contribution provisions of Section 10, and is fully informed regarding said provisions. Each of the parties hereto further acknowledges that the provisions of Section 9 and Section 10 hereof fairly allocate the risks in light of the ability of the parties to investigate the Company, its affairs and its business in order to assure that adequate disclosure has been made in the Registration Statement, any preliminary prospectus, the Time of Sale Prospectus, each free writing prospectus and the Prospectus (and any amendments and supplements to the foregoing), as contemplated by the Securities Act and the Exchange Act.

If the foregoing is in accordance with your understanding of our agreement, kindly sign and return to the Company the enclosed copies hereof, whereupon this instrument, along with all counterparts hereof, shall become a binding agreement in accordance with its terms.

Very truly yours,

CTI BIOPHARMA CORP.

By: /s/ David Kirske
Name: David Kirske
Title: Chief Financial Officer

The foregoing Underwriting Agreement is hereby confirmed and accepted by the Representative in New York, New York as of the date first above written.

LEERINK PARTNERS LLC

Acting individually and as Representative
of the several Underwriters named in
the attached Schedule A.

LEERINK PARTNERS LLC

By: /s/ Bryan Giraud
Name: Bryan Giraud
Title: Sr. Managing Director

Schedule A

Underwriters	Number of Firm Shares to be Purchased
Leerink Partners LLC	9,400,000
JMP Securities	4,000,000
Needham & Company, LLC	3,300,000
Oppenheimer & Co. Inc.	3,300,000
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Total	20,000,000
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Information Included in the Time of Sale Prospectus

Pricing Information Conveyed Orally by the Underwriters:

Number of Firm Shares: 20,000,000

Number of Optional Shares: 3,000,000

Price per Share to the public: \$3.00

Underwriting Discount per Share: \$0.18

Free Writing Prospectus dated February 8, 2018, filed with the SEC on February 8, 2018.

EXHIBIT A-1

Form of Opinion of Phillips Ormond Fitzpatrick

February __, 2018

Leerink Partners LLC
As Representative of the Several Underwriters

Ladies and Gentlemen:

Re: CTI BioPharma Corp.

This letter is being furnished to you pursuant to Section 6(e) of the Underwriting Agreement, dated as of February 8, 2018 (the “Underwriting Agreement”), among CTI BioPharma Corp. (the “Company”), a Delaware corporation, and the several underwriters listed on Schedule A to the Underwriting Agreement (the “Underwriters”), for which you are acting as the Representative.

We are providing this letter to you at the request of the company pursuant to section 6(e) of the Underwriting Agreement.

1. We are a firm of Australian Patent and Trademark Attorneys registered to practice under Chapter 20 of the Australian Patents Act 1990.
 2. Our opinion relates only to matters concerning the drug Pacritinib and is limited to those patents relating thereto for which we are IP counsel and for which we continue to be the primary instructing attorney responsible for the files.
 3. In making the statements below we note a number of the documents refer to “EU” or “European patents”. Under European patent law a European patent or EU patent only provides protection in those countries that the European patent is “validated in” and for which renewal payments are made in a timely manner. If a European patent is not validated in a specific country or if a renewal payment is not made in a timely manner then the European patent will not provide any protection in that country. The following statements need to be read in light of this qualification.
 4. In preparing our opinion we have reviewed the following documents which were provided to us or sourced from the noted locations.
 - copy of the Underwriting Agreement provided to us by the Company (excluding the documents referred to therein);
 - the registration statement on form S-3 filed under the Securities Act of 1933, as amended, dated 31 January 2018 and viewed on 2 February 2018 (excluding the documents incorporated by reference and the exhibits) as posted on the website of the United States Securities and Exchange Commission at:
https://www.sec.gov/Archives/edgar/data/891293/000089129318000034/cti_-x3xpostxeffectivexa.htm;
 - Quarterly report on form 10-Q, filed under the Securities Exchange Act of 1934 for the period ending 31 March 2017 (excluding the documents incorporated by reference and the exhibits) viewed on 2 February 2018 as posted on the website of the United States Securities and
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Exchange Commission at: <https://www.sec.gov/Archives/edgar/data/891293/000089129317000054/cti10q03312017.htm> (the "Q1 Quarterly Report on Form 10-Q");

- Quarterly report on form 10-Q, filed under the Securities Exchange Act of 1934 for the period ending 30 June 2017 (excluding the documents incorporated by reference and the exhibits) viewed on 30 January 2018 as posted on the website of the United States Securities and Exchange Commission at: <https://www.sec.gov/Archives/edgar/data/891293/000089129317000089/cti10q06302017.htm> (the "Q2" Quarterly Report on Form 10-Q");
 - Quarterly report on form 10-Q, filed under the Securities Exchange Act of 1934 for the period ending 30 September 2017 (excluding the documents incorporated by reference and the exhibits) viewed on 30 January 2018 as posted on the website of the United States Securities and Exchange Commission at: <https://www.sec.gov/Archives/edgar/data/891293/000089129317000114/cti10q09302017.htm> (the "Q3" Quarterly Report on Form 10-Q");
 - copy of the Preliminary Prospectus Supplement (excluding the documents incorporated by reference and the exhibits) viewed on , 2018 as posted on the website of the United States Securities and Exchange Commission at: www.sec.gov/Archives/edgar/data/891293/000119312517194653/d404406d424b5.htm (the "Preliminary Prospectus Supplement");
 - copy of the Prospectus Supplement (excluding the documents incorporated by reference and the exhibits) viewed on , 2018 as posted on the website of the United States Securities and Exchange Commission at: www.sec.gov/Archives/edgar/data/891293/000119312517197124/d404406d424b2.htm (the "Prospectus Supplement");
 - Annual Report pursuant to section 13 or 15(d) of the Securities Exchange Act of 1934 (Form 10-K) for the fiscal year ended 31 December 2016 viewed on 30 January 2018 (excluding the documents incorporated by reference and the exhibits) as posted on the website of the United States Securities and Exchange Commission at: www.sec.gov/Archives/edgar/data/891293/000089129317000030/cti10k12312016document.htm (the "Annual report on Form 10-K").
5. We have assumed that the documents supplied to us for the purpose of preparing this opinion are genuine copies of the originals and that the materials available at the hyperlinks will not change.
6. To our knowledge that statements included in the Registration Statement, the Preliminary Prospectus Supplement and the Prospectus Supplement relating to patents or proprietary rights in relation to Pacritinib (collectively, the "Intellectual Property Statements related to Pacritinib"), insofar as such Intellectual Property Statements related to Pacritinib constitute summaries of documents or legal proceedings are accurate and complete in all material respects and present fairly the information purported to be shown; nothing has come to our attention that causes us to believe that (i) the Intellectual Property Statements related to Pacritinib included in the Registration Statement, at the time that the Registration Statement became effective, contained an untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary to make the statements therein not misleading, (ii) the Intellectual Property Statements related to Pacritinib included in the Preliminary Prospectus Supplement, as of the Applicable Time, included an untrue statement of a material fact or omitted 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, or (iii) the Intellectual Property Statements related to Pacritinib included in the Prospectus Supplement as of the date of the Prospectus Supplement or the date hereof, included or include an untrue statement of a material fact or omitted or omit to state a
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material fact necessary in order to make the statements therein in light of the circumstances under which they were made, not misleading.

7. To our knowledge, (i) there are no legal or governmental proceedings pending relating to patent rights in relation to Pacritinib of the Company or any of its subsidiaries (with the exception of normal prosecution of pending patent applications at the United States Patent and Trademark Office and equivalent foreign patent offices), and (ii) no such proceedings (with the exception of normal prosecution of pending patent applications at the United States Patent and Trademark Office and equivalent foreign patent offices) are threatened or contemplated by government authorities or others.
8. To our knowledge, (i) neither the Company nor any of its subsidiaries is infringing or otherwise violating, and, upon the commercialization and sale of the products or services related to Pacritinib described in the Registration Statement, the Preliminary Prospectus Supplement or the Prospectus Supplement as under development, none of them would infringe a valid claim of a patent held by any third party, and we are unaware of any facts which would form a reasonable basis for a claim of any such infringement, and (ii) there are no infringements by others of any of the patents of the Company related to Pacritinib or any of its subsidiaries.
9. To our knowledge, (i) the Company (either directly or through its subsidiaries) has clear beneficial title (whether registered or otherwise) or valid license rights to the patents related to Pacritinib described in the Registration Statement, the Preliminary Prospectus Supplement or the Prospectus Supplement as owned or licensed by the Company or any subsidiary and (ii) except as disclosed in the Registration Statement, the Preliminary Prospectus Supplement and the Prospectus Supplement, there are no rights of third parties to such patents.
10. To our knowledge, we are not aware of any fact with respect to the patent applications of the Company or any of the subsidiaries presently on file related to Pacritinib that (i) would preclude the issuance of patents with respect to such applications, (ii) would lead us to conclude that such patents, when issued, would not be valid and enforceable in accordance with applicable regulations or (iii) would result in a third party having any rights in any patents issuing from such patent applications.

Capitalized terms used herein without definition shall have the respective meanings ascribed to them in the Underwriting Agreement.

Yours sincerely

Neil K Ireland PhD
Partner
neil.ireland@pof.com.au

EXHIBIT A-2

Form of Opinion of Seed Intellectual Property Law Group PLLC

Eric A. Harwood, Ph.D.
Partner
206-622-4900
EricH@seedip.com

Leerink Partners LLC
299 Park Avenue, 21st Floor
New York, New York 10171

Re: CTI BioPharma Corp.
Seed IP Reference: 200144.001

Ladies and Gentlemen:

This letter is being furnished to you pursuant to Section 6(f) of the Underwriting Agreement, dated as of __, 2018 (the "Underwriting Agreement"), among CTI BioPharma Corp. (the "Company"), a Washington corporation, and Leerink Partners LLP LLC, as representative of the several underwriters identified in the Underwriting Agreement (the "Representative"). Capitalized terms used herein and not otherwise defined herein shall have the respective meanings ascribed to them in the Underwriting Agreement.

Since 2002, Seed Intellectual Property Law Group PLLC ("Seed") has represented the Company in regard to certain patent matters that have been referred to us by the Company. In January 2012, Seed began representing the Company with respect to additional patent matters, including patent matters related to PIXUVRI® (pixantrone).

Whenever our opinions herein are qualified by the phrases "to the best of our knowledge" or "reason to believe," such language means that our opinions are based upon the actual knowledge of attorneys present within our firm without special investigation. With respect to this letter, the following opinions address only those patent matters related to pixantrone and, to a limited extent, tosedostat and pacritinib. We understand that the Company may not have consulted us regarding other patent matters, and we express no opinion on such matters.

In rendering this opinion, we have assumed the genuineness and authenticity of all signatures on original documents; the authenticity of all documents submitted to us as originals; the conformity to originals of all documents submitted to us as copies; the accuracy, completeness, and authenticity of certificates of public officials; and the due authorization, execution, and delivery of all documents, when such authorization, execution and delivery are prerequisites to the effectiveness of such documents. We have also assumed that all individuals executing and delivering documents in their individual capacities had the legal capacity to execute and deliver the same.

With regard to our opinions concerning pixantrone related patent matters, our role with respect to these patent matters of the Company is currently limited to legal representation concerning the filing and/or prosecution of the Company's U.S. patents and patent applications listed in the attached Appendix A

(pixantrone) and supervision of the filing and/or prosecution of the Company's foreign patents and patent applications listed in Appendix A (collectively the "Pixantrone Patents").

Our representation concerning tosedostat is limited to: (i) a general freedom to practice review related to this compound and to use of the compound for treating cancer; (ii) status searches we have performed on available patent record databases relating to the patents and patent applications listed in the attached Appendix B (Tosedostat) (the "Tosedostat Patents"); (iii) drafting and filing of U.S. Provisional Application No. 62/175,100 and PCT Application No. US2016/037078, which are listed in Appendix B; and (iv) a yet-to-be performed freedom to practice analysis related to specific uses of tosedostat. We have not represented the company with respect to prosecution of patent matters entitled "Cytostatic Agents" that are related to tosedostat (*see* Appendix B).

Our representation of pacritinib related matters is limited to PCT Application No. PCT/US2016/054231, listed in Appendix C (Pacritinib) (the "Pacritinib Patents"), and filing, supervision and/or prosecution of any national phase applications that may be filed from the same.

We have not audited any other patents or patent applications of the Company or concerned ourselves with any other patent related issues other than those enumerated above, and we are not rendering any opinion with respect to such matters. The Registration Statement, the Preliminary Prospectus, the Prospectus, the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2016 ("Annual Report on Form 10-K"), as filed with the U.S. Securities and Exchange Commission (the "SEC") on March 2, 2017, and the Company's Quarterly Reports on Form 10-Q ("Quarterly Report on Form 10-Q") for the quarter ended March 31, 2017, as filed with the SEC on May 3, 2017, the quarter ended June 30, 2017, as filed with the SEC on August 4, 2017, and the quarter ended September 30, 2017, as filed with the SEC on November 7, 2017, have been provided to us. We have reviewed the Company's Annual Report on Form 10-K and the Company's Quarterly Reports on Form 10-Q with respect to statements therein specifically under the section "Patents and Proprietary Rights" in the Form 10-K and under the section "Risk Factors" that relate to patents or intellectual property rights in the Annual Report on Form 10-K and Quarterly Reports on Form 10-Q, and which sections are incorporated by reference into each of the Registration Statement, the Preliminary Prospectus, and the Prospectus. On the basis of the foregoing, we are of the following opinion.

1. The statements incorporated into the Registration Statement relating to patents or intellectual property rights with respect to pixantrone, tosedostat and pacritinib (collectively, the "Intellectual Property Statements"), insofar as such Intellectual Property Statements constitute summaries of documents or legal proceedings or refer to matters of law or legal conclusions, are accurate and complete in all material respects and present fairly the information purported to be shown. Nothing has come to our attention that gives us reason to believe that: (i) the Intellectual Property Statements included in the Registration Statement, at the time that the Registration Statement became effective, contained an untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary to make the statements therein not misleading; (ii) the Intellectual Property Statements included in the Time of Sale Prospectus, as of the Applicable Time, included an untrue statement of a material fact or omitted 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; or (iii) the Intellectual Property Statements included in the Prospectus, as of the date of the Prospectus or the Closing Date, included or include an untrue statement of a material fact or omitted or 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.

2. To the best of our knowledge, and with the exception of the patent applications identified under the caption "Methods for Treating Cancers" in Appendix B: (i) the Company (either directly or

through its subsidiaries) has clear title or valid license rights to the Pixantrone Patents, the Tosedostat Patents and the Pacritinib Patents described in the Registration Statement, the Preliminary Prospectus, and the Prospectus Supplement; and (ii) except as disclosed in the Registration Statement, the Preliminary Prospectus, and the Prospectus Supplement, third parties have no rights to such patents.

3. To the best of our knowledge, the Company's practice is to obtain written assignments from inventors and to record, or cause to be recorded, such assignments with the applicable patent offices. With respect to Pixantrone Patents and Pacritinib Patents that have been assigned to the Company, we have no reason to believe that such assignments are invalid.

4. To the best of our knowledge, no facts or circumstances of which we are aware would form a basis for belief that any of the issued Pixantrone Patents, Tosedostat and Pacritinib Patents are invalid or unenforceable.

5. To the best of our knowledge: (i) other than patent office review of pending patent applications included in the Pixantrone Patents, no legal or governmental proceedings are pending that involve the Pixantrone Patents, Tosedostat Patents or Pacritinib Patents; (ii) neither the Company nor any of its subsidiaries has received any notice of a threatened or contemplated legal proceeding by governmental authorities or others challenging the validity or scope of the Pixantrone Patents, Tosedostat Patents or Pacritinib Patents; and (iii) no such proceedings have been threatened by governmental authorities or others.

6. To the best of our knowledge, none of the Pixantrone Patents, Tosedostat Patents and Pacritinib Patents is the subject of an interference, reexamination, or reissue proceeding, and none of the Pixantrone Patents, Tosedostat Patents and Pacritinib Patents is the subject of an opposition proceeding.

7. To the best of our knowledge: (i) there is no pending or threatened action, suit, proceeding, or claim by others that the Company or any of its subsidiaries is infringing or otherwise violating a valid claim of a patent held by a third party, and, upon the commercialization and sale of the products or services relating to the Pixantrone Patents, Tosedostat Patents and Pacritinib Patents described in the Registration Statement, the Time of Sale Prospectus or the Prospectus as under development, none of them would infringe a valid claim of a patent held by any third party; and (ii) there are no infringements by others of any of the Pixantrone Patents, Tosedostat Patents and Pacritinib Patents.

8. To the best of our knowledge, we are not aware of any fact with respect to the patent applications for Pixantrone Patents presently on file that: (i) would preclude the issuance of Pixantrone Patents with respect to such applications; (ii) would lead us to conclude that such patent applications for Pixantrone Patents, when issued, would not be valid and enforceable in accordance with applicable regulations; or (iii) with the exception of certain ownership rights retained by applicable third parties pertaining to the patent applications identified under the caption "Methods for Treating Cancers" in Appendix B, would result in a third party having any rights in any Pixantrone Patents issuing from such patent applications.

This letter is rendered only to you, as Representative of the Underwriters, and is solely for the benefit of the Underwriters in connection with the transactions referenced in the first paragraph of this letter. This letter may not be relied upon by you for any other purpose, or furnished to, assigned to, quoted to, or relied upon by any other person, firm or other entity for any purpose (including any person, firm or other entity that acquires Shares from you) without our prior written consent, which may be granted or withheld in our sole discretion. This letter is limited to the matters expressly set forth in this letter, and no opinion has been implied, or may be inferred, beyond the matters expressly stated. This letter speaks only as to law and facts in effect or existing as of the date hereof, and we undertake no obligation or responsibility

to update or supplement this letter to reflect any facts or circumstances that may hereafter come to our attention or any changes in any law that may hereafter occur.

Very truly yours,
Seed IP Law Group LLP

Eric A. Harwood

Enclosures:

Appendix A (Pixantrone)
Appendix B (Tosedostat)
Appendix C (Pacritinib)

cc: Corey Masten-Legge, CTI BioPharma Corp.

Form of Lock-up Agreement

January ___, 2018

LEERINK PARTNERS LLC
As Representative of the Several Underwriters

LEERINK PARTNERS LLC
520 Madison Avenue
New York, New York 10022

RE: CTI BioPharma Corp. (the “**Company**”)

Ladies & Gentlemen:

The undersigned is an owner of shares of common stock, par value \$0.001 per share, of the Company (“**Shares**”) or of securities convertible into or exchangeable or exercisable for Shares. The Company proposes to conduct a public offering of Shares (the “**Offering**”) for which Leerink Partners LLC (“**Leerink**”) will act as the representative of the underwriters. The undersigned recognizes that the Offering will benefit each of the Company and the undersigned. The undersigned acknowledges that the underwriters are relying on the representations and agreements of the undersigned contained in this letter agreement in conducting the Offering and, at a subsequent date, in entering into an underwriting agreement (the “**Underwriting Agreement**”) and other underwriting arrangements with the Company with respect to the Offering.

Annex A sets forth definitions for capitalized terms used in this letter agreement that are not defined in the body of this agreement. Those definitions are a part of this agreement.

In consideration of the foregoing, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the undersigned hereby agrees that, during the Lock-up Period, the undersigned will not (and will use his/her best efforts to cause any Family Member not to), without the prior written consent of Leerink, which may withhold its consent in its sole discretion:

- Sell or Offer to Sell any Shares or Related Securities currently or hereafter owned either of record or beneficially (as defined in Rule 13d-3 under the Exchange Act) by the undersigned or such Family Member,
 - enter into any Swap,
 - make any demand for, or exercise any right with respect to, the registration under the Securities Act of the offer and sale of any Shares or Related Securities, or cause to be filed a registration statement, prospectus or prospectus supplement (or an amendment or supplement thereto) with respect to any such registration, or
 - publicly announce any intention to do any of the foregoing.
-

The foregoing will not apply to the registration of the offer and sale of the Shares, and the sale of the Shares to the underwriters, in each case as contemplated by the Underwriting Agreement. In addition, the foregoing restrictions shall not apply to (A) establishment of a trading plan pursuant to Rule 10b5-1 under the Exchange Act for the transfer of Shares, provided that such plan shall not provide for any transfers during the Lock-up Period and the entry into such plan shall not be publicly disclosed, including in any filing under the Exchange Act, during the Lock-up Period, (B) the transfer of Shares or Related Securities to the Company upon the termination or forfeiture of an equity or equity-based award (or the shares subject thereto), or (C) the transfer of Shares or Related Securities (i) by gift, (ii) by will or intestate succession to a Family Member, (iii) to a trust whose beneficiaries consist exclusively of one or more of the undersigned and/or a Family Member, provided, further, that in any such case under clause (C) above, it shall be a condition to such transfer that:

- each transferee executes and delivers to Leerink an agreement in form and substance satisfactory to Leerink stating that such transferee is receiving and holding such Shares and/or Related Securities subject to the provisions of this letter agreement and agrees not to Sell or Offer to Sell such Shares and/or Related Securities, engage in any Swap or engage in any other activities restricted under this letter agreement except in accordance with this letter agreement (as if such transferee had been an original signatory hereto); and
- prior to the expiration of the Lock-up Period, no public disclosure or filing under the Exchange Act by any party to the transfer (donor, donee, transferor or transferee) shall be required, or made voluntarily, reporting a reduction in beneficial ownership of Shares in connection with such transfer.

In addition, if the undersigned is an officer or director of the Company, Leerink agrees that, at least three business days before the effective date of any release or waiver of the foregoing restrictions in connection with a transfer of Shares, Leerink will notify the Company of the impending release or waiver. Any release or waiver granted by Leerink hereunder to any such officer or director shall only be effective two business days after the effective date of such release or waiver. The provisions of this paragraph will not apply if both (a) the release or waiver is effected solely to permit a transfer not for consideration and (b) the transferee has agreed in writing to be bound by the same terms described in this letter agreement that are applicable to the transferor to the extent and for the duration that such terms remain in effect at the time of the transfer.

The undersigned also agrees and consents to the entry of stop transfer instructions with the Company's transfer agent and registrar against the transfer of Shares or Related Securities held by the undersigned and the undersigned's Family Members, if any, except in compliance with the foregoing restrictions.

With respect to the Offering only, the undersigned waives any registration rights relating to registration under the Securities Act of the offer and sale of any Shares and/or any Related Securities owned either of record or beneficially by the undersigned, including any rights to receive notice of the Offering.

The undersigned confirms that the undersigned has not, and has no knowledge that any Family Member has, directly or indirectly, taken any action designed to or that might 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 of the Shares. The undersigned will not, and will use his/her best efforts to cause any Family Member not to, take, directly or indirectly, any such action.

Whether or not the Offering occurs as currently contemplated or at all depends on market conditions and other factors. The Offering will only be made pursuant to the Underwriting Agreement, the terms of which are subject to negotiation between the Company and the underwriters.

The undersigned hereby represents and warrants that the undersigned has full power, capacity and authority to enter into this letter agreement. This letter agreement is irrevocable and will be binding on the undersigned and the successors, heirs, personal representatives and assigns of the undersigned.

This letter agreement shall be governed by, and construed in accordance with, the laws of the State of New York.

If for any reason (i) the Underwriting Agreement (excluding any provisions that expressly survive termination) shall be terminated prior to the First Closing Date (as defined in the Underwriting Agreement), (ii) the Underwriting Agreement is not executed and delivered by the Underwriters and the Company on or before February 28, 2018, or (iii) at any time prior to the execution and delivery of the Underwriting Agreement the Underwriters and the Company mutually determine to abandon the Offering, then this letter agreement shall terminate and be of no further force or effect.

Signature

—

Printed Name of Person Signing

*(Indicate capacity of person signing if
signing as custodian or trustee, or on behalf
of an entity)*

—

**Certain Defined Terms
Used in Lock-up Agreement**

For purposes of the letter agreement to which this Annex A is attached and of which it is made a part:

- “**Call Equivalent Position**” shall have the meaning set forth in Rule 16a-1(b) under the Exchange Act.
 - “**Exchange Act**” shall mean the Securities Exchange Act of 1934, as amended.
 - “**Family Member**” shall mean the spouse of the undersigned, an immediate family member of the undersigned or an immediate family member of the undersigned's spouse, in each case living in the undersigned's household or whose principal residence is the undersigned's household (regardless of whether such spouse or family member may at the time be living elsewhere due to educational activities, health care treatment, military service, temporary internship or employment or otherwise). “**Immediate family member**” as used above shall have the meaning set forth in Rule 16a-1(e) under the Exchange Act.
 - “**Lock-up Period**” shall mean the period beginning on the date hereof and continuing through the close of trading on the date that is 90 days after the date of the Prospectus (as defined in the Underwriting Agreement).
 - “**Put Equivalent Position**” shall have the meaning set forth in Rule 16a-1(h) under the Exchange Act.
 - “**Related Securities**” shall mean any options or warrants or other rights to acquire Shares or any securities exchangeable or exercisable for or convertible into Shares, or to acquire other securities or rights ultimately exchangeable or exercisable for or convertible into Shares.
 - “**Securities Act**” shall mean the Securities Act of 1933, as amended.
 - “**Sell or Offer to Sell**” shall mean to:
 - sell, offer to sell, contract to sell or lend,
 - effect any short sale or establish or increase a Put Equivalent Position or liquidate or decrease any Call Equivalent Position
 - pledge, hypothecate or grant any security interest in, or
 - in any other way transfer or dispose of,
 in each case whether effected directly or indirectly.
 - “**Swap**” shall mean any swap, hedge or similar arrangement or agreement that transfers, in whole or in part, the economic risk of ownership of Shares or Related Securities, regardless of whether any such transaction is to be settled in securities, in cash or otherwise.
-

Capitalized terms not defined in this Annex A shall have the meanings given to them in the body of this lock-up agreement.

Directors, Executive Officers and Others
Signing Lock-up Agreement

Directors:

Adam R. Craig
Laurent Fischer
Richard L. Love
Michael A. Metzger
David Parkinson
Matthew D. Perry
Frederick W. Telling
Reed V. Tuckson

Executive Officers:

Jack W. Singer
Bruce J. Seeley
David H. Kirske

**CTI BIOPHARMA CORP.
CERTIFICATE OF DESIGNATION OF PREFERENCES,
RIGHTS AND LIMITATIONS**

OF

SERIES O CONVERTIBLE PREFERRED STOCK

PURSUANT TO SECTION 151 OF THE
DELAWARE GENERAL CORPORATION LAW

CTI BIOPHARMA CORP., Delaware corporation (the “**Corporation**”), in accordance with the provisions of Section 103 of the Delaware General Corporation Law (the “**DGCL**”) does hereby certify that, in accordance with Sections 141(c) and 151 of the DGCL, the following resolution was duly adopted by a committee of the Board of Directors of the Corporation acting upon authority delegated by the Board of Directors, on February 7, 2018:

RESOLVED, pursuant to authority expressly set forth in the Certificate of Incorporation of the Corporation (the “**Certificate of Incorporation**”), the issuance of a series of Preferred Stock designated as the Series O Convertible Preferred Stock, par value \$0.001 per share, of the Corporation is hereby authorized and the designation, number of shares, powers, preferences, rights, qualifications, limitations and restrictions thereof (in addition to any provisions set forth in the Certificate of Incorporation that are applicable to the Preferred Stock of all classes and series) are hereby fixed, and the Certificate of Designation of Preferences, Rights and Limitations of Series O Convertible Preferred Stock is hereby approved as follows:

SERIES O CONVERTIBLE PREFERRED STOCK

Section 1. Definitions. For the purposes hereof, the following terms shall have the following meanings:

“**Affiliate**” means any person or entity that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a person or entity, as such terms are used in and construed under Rule 144 under the Securities Act of 1933, as amended. With respect to a Holder, any investment fund or managed account that is managed on a discretionary basis by the same investment manager as such Holder will be deemed to be an Affiliate of such Holder.

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

“**Closing Sale Price**” means, for any security as of any date, the last closing trade price for such security prior to 4:00 p.m., New York City time, on the principal securities exchange or trading market where such security is listed or traded, as reported by Bloomberg, L.P. (or an equivalent, reliable reporting service mutually acceptable to and hereafter designated by Holders of a majority of the then-outstanding Series O Preferred Stock and the Corporation), or if the foregoing do not apply, the last trade price of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg, L.P., or, if no last trade price is reported for such security by Bloomberg, L.P., the average of the bid prices of any market makers for such security as reported on the OTC Pink Market by OTC Markets Group, Inc. If the Closing Sale Price cannot be calculated for a security on a particular date on

any of the foregoing bases, the Closing Sale Price of such security on such date shall be the fair market value as determined in good faith by the Board of Directors of the Corporation.

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

“**Common Stock**” means the Corporation’s common stock, par value of \$0.001 per share, and stock of any other class of securities into which such securities may hereafter be reclassified into.

“**Conversion Price**” means \$3.00.

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

“**Daily Failure Amount**” means the product of (x) .005 multiplied by (y) the Closing Sale Price of the Common Stock on the applicable Share Delivery Date.

“**DGCL**” shall mean the Delaware General Corporation Law.

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

“**Holder**” means any holder of Series O Preferred Stock.

“**Issuance Date**” means February 8, 2018.

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

“**Stated Value**” shall mean \$2,000.00 per share.

“**Trading Day**” means a day on which the Common Stock is traded for any period on a principal securities exchange or if the Common Stock is not traded on a principal securities exchange, on a day that the Common Stock is traded on another securities market on which the Common Stock is then being traded.

Section 2. Designation, Amount and Par Value; Assignment.

(a) The series of preferred stock designated by this Certificate of Designation shall be designated as the Corporation’s Series O Convertible Preferred Stock (the “**Series O Preferred Stock**”) and the number of shares so designated shall be 12,575. Series O Preferred Stock shall have par value of \$0.001 per share.

(b) The Corporation shall register shares of the Series O Preferred Stock, upon records to be maintained by the Corporation for that purpose (the “**Series O Preferred Stock Register**”), in the name of the Holders thereof from time to time. The Corporation may deem and treat the registered Holder of shares of Series O Preferred Stock as the absolute owner thereof for the purpose of any conversion thereof and for all other purposes. Shares of Series O Preferred Stock may be issued solely in book-entry form or, if requested by any Holder, such Holder’s shares may be issued in certificated form. The Corporation shall register the transfer of any shares of Series O Preferred Stock in the Series O Preferred Stock Register, upon surrender of the certificates (if applicable) evidencing such shares to be transferred, duly endorsed

by the Holder thereof, to the Corporation at its address specified herein. Upon any such registration or transfer, a new certificate evidencing the shares of Series O Preferred Stock so transferred shall be issued to the transferee and a new certificate evidencing the remaining portion of the shares not so transferred, if any, shall be issued to the transferring Holder, in each case, within three Business Days. The provisions of this Certificate of Designation are intended to be for the benefit of all Holders from time to time and shall be enforceable by any such Holder.

Section 3. Dividends. Holders shall be entitled to receive, and the Corporation shall pay, dividends on shares of the Series O Preferred Stock (on an as-if-converted-to-Common-Stock basis, without regard to the Beneficial Ownership Limitation) equal to and in the same form, and in the same manner, as dividends (other than dividends on shares of the Common Stock payable in the form of Common Stock) actually paid on shares of the Common Stock when, as and if such dividends (other than dividends payable in the form of Common Stock) are paid on shares of the Common Stock. Other than as set forth in the previous sentence, no other dividends shall be paid on shares of Series O Preferred Stock, and the Corporation shall pay no dividends (other than dividends payable in the form of Common Stock) on shares of the Common Stock unless it simultaneously complies with the previous sentence.

Section 4. Voting Rights. Except as otherwise provided herein or as otherwise required by the DGCL, the Series O Preferred Stock shall have no voting rights. However, as long as any shares of Series O Preferred Stock are outstanding, the Corporation shall not, without the affirmative vote of the Holders of a majority of the then outstanding shares of the Series O Preferred Stock, (i) alter or change adversely the powers, preferences or rights given to the Series O Preferred Stock or alter or amend this Certificate of Designation, amend or repeal any provision of, or add any provision to, the Certificate of Incorporation or bylaws of the Corporation, or file any articles of amendment, certificate of designations, preferences, limitations and relative rights of any series of preferred stock, if such action would adversely alter or change the preferences, rights, privileges or powers of, or restrictions provided for the benefit of the Series O Preferred Stock, regardless of whether any of the foregoing actions shall be by means of amendment to the Certificate of Incorporation or by merger, consolidation or otherwise, (ii) issue further shares of Series O Preferred Stock or increase or decrease (other than by conversion) the number of authorized shares of Series O Preferred Stock, or (iii) enter into any agreement with respect to any of the foregoing.

Section 5. Rank; Liquidation.

(a) The Series O Preferred Stock shall rank: (i) senior to the Series ZZ Junior Participating Cumulative Preferred Stock of the Corporation and to any class or series of capital stock of the Corporation hereafter created specifically ranking by its terms junior to any Series O Preferred Stock (“**Junior Securities**”); (ii) on parity with the Common Stock and any other class or series of capital stock of the Corporation hereafter created specifically ranking by its terms on parity with the Series O Preferred Stock (the “**Parity Securities**”); and (iii) junior to any class or series of capital stock of the Corporation hereafter created specifically ranking by its terms senior to any Series O Preferred Stock (“**Senior Securities**”), in each case, as to distributions of assets upon liquidation, dissolution or winding up of the Corporation, whether voluntarily or involuntarily (all such distributions being referred to collectively as “**Distributions**”).

(b) Subject to the prior and superior rights of the holders of any Senior Securities of the Corporation, upon liquidation, dissolution or winding up of the Corporation, whether voluntary or involuntary (a “**Liquidation**”), the Holders shall be entitled to receive out of the assets, whether capital or surplus, of the Corporation an amount equal to the Stated Value for each outstanding share of Series O Preferred Stock, plus any declared and unpaid dividends and any other payments that may be due thereon, before any

distribution or payment shall be made to the holders of any Junior Securities, and if the assets of the Corporation shall be insufficient to pay in full such amounts, then the entire assets to be distributed to the Holders shall be ratably distributed among the Holders and the holders of all securities which are pari passu with the Series O Preferred Stock as to liquidation in accordance with the respective amounts that would be payable on all such securities if all amounts payable thereon were paid in full. A Fundamental Transaction shall not be deemed a Liquidation unless the Corporation expressly declares that such Fundamental Transaction shall be treated as if it were a Liquidation. The Corporation shall mail written notice of any such Liquidation, not less than 25 days before the payment date stated therein, to each Holder.

Section 6. Conversion.

(a) Conversions at Option of Holder. Each share of Series O Preferred Stock shall be convertible, at any time and from time to time from and after the Issuance Date, at the option of the Holder thereof, into a number of shares of Common Stock equal to the Conversion Ratio. Holders shall effect conversions by providing the Corporation with the form of conversion notice attached hereto as **Annex A** (a "**Notice of Conversion**"), duly completed and executed. Other than a conversion following a Fundamental Transaction or following a notice provided for under Section 7(d)(ii) hereof, the Notice of Conversion must specify at least a number of shares of Series O Preferred Stock to be converted equal to the lesser of (x) 100 shares (such number subject to appropriate adjustment following the occurrence of an event specified in Section 7(a) hereof) and (y) the number of shares of Series O Preferred Stock then held by the Holder. Provided the Corporation's transfer agent is participating in the Depository Trust Company ("**DTC**") Fast Automated Securities Transfer program, the Notice of Conversion may specify, at the Holder's election, whether the applicable Conversion Shares shall be credited to the account of the Holder's prime broker with DTC through its Deposit Withdrawal Agent Commission system (a "**DWAC Delivery**"). The "**Conversion Date**", or the date on which a conversion shall be deemed effective, shall be defined as the Trading Day that the Notice of Conversion, completed and executed, is sent by facsimile to, and received during regular business hours by, the Corporation; provided that the original certificate(s) (if any) representing such shares of Series O Preferred Stock being converted, duly endorsed, and the accompanying Notice of Conversion, are received by the Corporation within two (2) Trading Days thereafter. In all other cases, the Conversion Date shall be defined as the Trading Day on which the original shares of Series O Preferred Stock being converted, duly endorsed, and the accompanying Notice of Conversion, are received by the Corporation. The calculations set forth in the Notice of Conversion shall control in the absence of manifest or mathematical error.

(b) Conversion Ratio. The "**Conversion Ratio**" for each share of Series O Preferred Stock shall be equal to the Stated Value divided by the Conversion Price.

(c) Beneficial Ownership Limitation. Notwithstanding anything herein to the contrary, the Corporation shall not effect any conversion of the Series O Preferred Stock, and a Holder shall not have the right to convert any portion of the Series O Preferred Stock, to the extent that, after giving effect to an attempted conversion set forth on an applicable Notice of Conversion, such Holder (together with such Holder's Affiliates, and any other Person whose beneficial ownership of Common Stock would be aggregated with the Holder's for purposes of Section 13(d) or Section 16 of the Exchange Act and the applicable regulations of the Commission, including any "group" of which the Holder is a member (the foregoing, "**Attribution Parties**")) would beneficially own a number of shares of Common Stock in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by such Holder and its Attribution Parties shall include the number of shares of Common Stock issuable upon conversion of the Series O Preferred Stock subject

to the Notice of Conversion with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which are issuable upon (A) conversion of the remaining, unconverted Series O Preferred Stock beneficially owned by such Holder or any of its Attribution Parties, and (B) exercise or conversion of the unexercised or unconverted portion of any other securities of the Corporation (including any warrants) beneficially owned by such Holder or any of its Attribution Parties that are subject to a limitation on conversion or exercise similar to the limitation contained herein. For purposes of this Section 6(c), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the applicable regulations of the Commission. In addition, for purposes hereof, "group" has the meaning set forth in Section 13(d) of the Exchange Act and the applicable regulations of the Commission. For purposes of this Section 6(c), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as stated in the most recent of the following: (A) the Corporation's most recent periodic or annual filing with the Commission, as the case may be, (B) a more recent public announcement by the Corporation that is filed with the Commission, or (C) a more recent notice by the Corporation or the Corporation's transfer agent to the Holder setting forth the number of shares of Common Stock then outstanding. Upon the written request of a Holder (which may be by email), the Corporation shall, within three (3) Trading Days thereof, confirm in writing to such Holder (which may be via email) the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to any actual conversion or exercise of securities of the Corporation, including shares of Series O Preferred Stock, by such Holder or its Attribution Parties since the date as of which such number of outstanding shares of Common Stock was last publicly reported or confirmed to the Holder. The "**Beneficial Ownership Limitation**" shall initially be 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock pursuant to such Notice of Conversion (to the extent permitted pursuant to this Section 6(c)). The Corporation shall be entitled to rely on representations made to it by the Holder in any Notice of Conversion regarding its Beneficial Ownership Limitation. Notwithstanding the foregoing, by written notice to the Corporation, (i) which will not be effective until the sixty-first (61st) day after such notice is delivered to the Corporation, the Holder may reset the Beneficial Ownership Limitation percentage to a higher percentage, not to exceed 19.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock pursuant to such Notice of Conversion and (ii) which will be effective immediately after such notice is delivered to the Corporation, the Holder may reset the Beneficial Ownership Limitation percentage to a lower percentage. Upon such a change by a Holder of the Beneficial Ownership Limitation, the Beneficial Ownership Limitation may not be further amended by such Holder without first providing the minimum notice required by this Section 6(c) Notwithstanding the foregoing, at any time following notice of a Fundamental Transaction, the Holder may waive and/or change the Beneficial Ownership Limitation effective immediately upon written notice to the Corporation and may reinstitute a Beneficial Ownership Limitation at any time thereafter effective immediately upon written notice to the Corporation.

(d) Mechanics of Conversion

(i) Delivery of Certificate or Electronic Issuance Upon Conversion. Not later than two (2) Trading Days after the applicable Conversion Date, or if the Holder requests the issuance of physical certificate(s), two (2) Trading Days after receipt by the Corporation of the original certificate(s) representing such shares of Series O Preferred Stock being converted, duly endorsed, and the accompanying Notice of Conversion (the "**Share Delivery Date**"), the Corporation shall (a) deliver, or cause to be delivered, to the converting Holder a physical certificate or certificates representing the number of Conversion Shares being acquired upon the conversion of shares of Series O Preferred Stock, or (b) in the case of a DWAC Delivery (if so requested by the Holder), electronically transfer such Conversion Shares by crediting the account of the

Holder's prime broker with DTC through its DWAC system. If in the case of any Notice of Conversion such certificate or certificates are not delivered to or as directed by or, in the case of a DWAC Delivery, such shares are not electronically delivered to or as directed by, the applicable Holder by the Share Delivery Date, the applicable Holder shall be entitled to elect to rescind such Conversion Notice by written notice to the Corporation at any time on or before its receipt of such certificate or certificates for Conversion Shares or electronic receipt of such shares, as applicable, in which event the Corporation shall promptly return to such Holder any original Series O Preferred Stock certificate delivered to the Corporation and such Holder shall promptly return to the Corporation any Common Stock certificates or otherwise direct the return of any shares of Common Stock delivered to the Holder through the DWAC system, representing the shares of Series O Preferred Stock unsuccessfully tendered for conversion to the Corporation.

(ii) Obligation Absolute. Subject to Section 6(c) hereof and subject to Holder's right to rescind a Conversion Notice pursuant to Section 6(d)(i) above, the Corporation's obligation to issue and deliver the Conversion Shares upon conversion of Series O Preferred Stock in accordance with the terms hereof are absolute and unconditional, irrespective of any action or inaction by a Holder to enforce the same, any waiver or consent with respect to any provision hereof, the recovery of any judgment against any Person or any action to enforce the same, or any setoff, counterclaim, recoupment, limitation or termination, or any breach or alleged breach by such Holder or any other Person of any obligation to the Corporation or any violation or alleged violation of law by such Holder or any other Person, and irrespective of any other circumstance which might otherwise limit such obligation of the Corporation to such Holder in connection with the issuance of such Conversion Shares. Subject to Section 6(c) hereof and subject to Holder's right to rescind a Conversion Notice pursuant to Section 6(d)(i) above, in the event a Holder shall elect to convert any or all of its Series O Preferred Stock, the Corporation may not refuse conversion based on any claim that such Holder or anyone associated or affiliated with such Holder has been engaged in any violation of law, agreement or for any other reason, unless an injunction from a court, on notice to Holder, restraining and/or enjoining conversion of all or part of the Series O Preferred Stock of such Holder shall have been sought and obtained by the Corporation, and the Corporation posts a surety bond for the benefit of such Holder in the amount of 150% of the value of the Conversion Shares into which would be converted the Series O Preferred Stock which is subject to such injunction, which bond shall remain in effect until the completion of arbitration/litigation of the underlying dispute and the proceeds of which shall be payable to such Holder to the extent it obtains judgment. In the absence of such injunction, the Corporation shall, subject to Section 6(c) hereof and subject to Holder's right to rescind a Conversion Notice pursuant to Section 6(d)(i) above, issue Conversion Shares upon a properly noticed conversion. If the Corporation fails to deliver to a Holder such certificate or certificates, or electronically deliver (or cause its transfer agent to electronically deliver) such shares in the case of a DWAC Delivery, pursuant to Section 6(d)(i) on or prior to the fifth (5th) Trading Day after the Share Delivery Date applicable to such conversion (other than a failure caused by incorrect or incomplete information provided by Holder to the Corporation), then, unless the Holder has rescinded the applicable Conversion Notice pursuant to Section 6(d)(i) above, the Corporation shall pay (as liquidated damages and not as a penalty) to such Holder an amount payable, at the Corporation's option, either (a) in cash or (b) to the extent that it would not cause the Holder or its Attribution Parties to exceed the Beneficial Ownership Limitation, in shares of Common Stock that are valued for these purposes at the Closing Sale Price on the date of such calculation, in each case equal to the product of (x) the number of Conversion Shares required to have been issued by the Corporation on such Share Delivery Date, (y) an amount equal to the Daily Failure Amount and (z) the number of Trading Days actually lapsed after such fifth (5th) Trading Day after the Share Delivery Date during which such certificates have not been delivered, or, in the case of a DWAC Delivery, such shares have not been electronically delivered; provided, however, the Holder shall only receive up to such amount of shares of Common Stock such that Holder and its Attribution Parties and any other persons or

entities whose beneficial ownership of Common Stock would be aggregated with the Holder's for purposes of Section 13(d) of the Exchange Act (including shares held by any "group" of which the Holder is a member, but excluding shares beneficially owned by virtue of the ownership of securities or rights to acquire securities that have limitations on the right to convert, exercise or purchase similar to the limitation set forth herein) shall not collectively beneficially own greater than the Beneficial Ownership Limitation. Nothing herein shall limit a Holder's right to pursue actual damages for the Corporation's failure to deliver Conversion Shares within the period specified herein and such Holder shall have the right to pursue all remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief; provided that Holder shall not receive duplicate damages for the Corporation's failure to deliver Conversion Shares within the period specified herein. The exercise of any such rights shall not prohibit a Holder from seeking to enforce damages pursuant to any other Section hereof or under applicable law.

(iii) Compensation for Buy-In on Failure to Timely Deliver Certificates Upon Conversion. If the Corporation fails to deliver to a Holder the applicable certificate or certificates or to effect a DWAC Delivery, as applicable, by the Share Delivery Date pursuant to Section 6(d)(i) (other than a failure caused by incorrect or incomplete information provided by Holder to the Corporation), and if after such Share Delivery Date such Holder is required by its brokerage firm to purchase (in an open market transaction or otherwise), or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by such Holder of the Conversion Shares which such Holder was entitled to receive upon the conversion relating to such Share Delivery Date (a "**Buy-In**"), then the Corporation shall (A) pay in cash to such Holder (in addition to any other remedies available to or elected by such Holder) the amount by which (x) such Holder's total purchase price (including any brokerage commissions) for the shares of Common Stock so purchased exceeds (y) the product of (1) the aggregate number of shares of Common Stock that such Holder was entitled to receive from the conversion at issue multiplied by (2) the actual sale price at which the sell order giving rise to such purchase obligation was executed (including any brokerage commissions) and (B) at the option of such Holder, either reissue (if surrendered) the shares of Series O Preferred Stock equal to the number of shares of Series O Preferred Stock submitted for conversion or deliver to such Holder the number of shares of Common Stock that would have been issued if the Corporation had timely complied with its delivery requirements under Section 6(d)(i). For example, if a Holder purchases shares of Common Stock having a total purchase price of \$11,000 to cover a Buy-In with respect to an attempted conversion of shares of Series O Preferred Stock with respect to which the actual sale price (including any brokerage commissions) giving rise to such purchase obligation was a total of \$10,000 under clause (A) of the immediately preceding sentence, the Corporation shall be required to pay such Holder \$1,000. The Holder shall provide the Corporation written notice, within three (3) Trading Days after the occurrence of a Buy-In, indicating the amounts payable to such Holder in respect of such Buy-In together with applicable confirmations and other evidence reasonably requested by the Corporation. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Corporation's failure to timely deliver certificates representing shares of Common Stock upon conversion of the shares of Series O Preferred Stock as required pursuant to the terms hereof; provided, however, that the Holder shall not be entitled to both (i) require the reissuance of the shares of Series O Preferred Stock submitted for conversion for which such conversion was not timely honored and (ii) receive the number of shares of Common Stock that would have been issued if the Corporation had timely complied with its delivery requirements under Section 6(d)(i).

(iv) Reservation of Shares Issuable Upon Conversion. The Corporation covenants that it will at all times reserve and keep available out of its authorized and unissued shares of Common Stock for the sole purpose of issuance upon conversion of the Series O Preferred Stock, free from preemptive rights or any other actual contingent purchase rights of Persons other than the Holders of the Series O Preferred Stock,

not less than such aggregate number of shares of the Common Stock as shall be issuable (taking into account the adjustments of Section 7) upon the conversion of all outstanding shares of Series O Preferred Stock. The Corporation covenants that all shares of Common Stock that shall be so issuable shall, upon issue, be duly authorized, validly issued, fully paid and non-assessable.

(v) [Reserved]

(vi) Transfer Taxes. The issuance of certificates for shares of the Common Stock upon conversion of the Series O Preferred Stock shall be made without charge to any Holder for any documentary stamp or similar taxes that may be payable in respect of the issue or delivery of such certificates, provided that the Corporation shall not be required to pay any tax that may be payable in respect of any transfer involved in the issuance and delivery of any such certificate upon conversion in a name other than that of the registered Holder(s) of such shares of Series O Preferred Stock and the Corporation shall not be required to issue or deliver such certificates unless or until the Person or Persons requesting the issuance thereof shall have paid to the Corporation the amount of such tax or shall have established to the satisfaction of the Corporation that such tax has been paid.

(e) Status as Stockholder. Upon each Conversion Date: (i) the shares of Series O Preferred Stock being converted shall be deemed converted into shares of Common Stock; and (ii) the Holder's rights as a holder of such converted shares of Series O Preferred Stock shall cease and terminate, excepting only the right to receive certificates for such shares of Common Stock and to any remedies provided herein or otherwise available at law or in equity to such Holder because of a failure by the Corporation to comply with the terms of this Certificate of Designation. In all cases, the holder shall retain all of its rights and remedies for the Corporation's failure to convert Series O Preferred Stock.

Section 7. Certain Adjustments.

(a) Stock Dividends and Stock Splits. If the Corporation, at any time while this Series O Preferred Stock is outstanding: (A) pays a stock dividend or otherwise makes a distribution or distributions payable in shares of Common Stock (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Corporation upon conversion of this Series O Preferred Stock) with respect to the then outstanding shares of Common Stock; (B) subdivides outstanding shares of Common Stock into a larger number of shares; or (C) combines (including by way of a reverse stock split) outstanding shares of Common Stock into a smaller number of shares, then the Conversion Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding any treasury shares of the Corporation) outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event (excluding any treasury shares of the Corporation). Any adjustment made pursuant to this Section 7(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision or combination.

(b) Fundamental Transaction. If, at any time while this Series O Preferred Stock is outstanding, (A) the Corporation effects any merger or consolidation of the Corporation with or into another Person or any stock sale to, or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, share exchange or scheme of arrangement) with or into another Person (other than such a transaction in which the Corporation is the surviving or continuing entity and its Common Stock is not exchanged for or converted into other securities, cash or property), (B) the Corporation effects any sale of all or substantially all of its assets in one transaction or a series of related transactions, (C) any tender offer or exchange offer (whether by the Corporation or another Person) is completed

pursuant to which more than 50% of the Common Stock not held by the Corporation or such Person is exchanged for or converted into other securities, cash or property, or (D) the Corporation effects any reclassification of the Common Stock or any compulsory share exchange pursuant (other than as a result of a dividend, subdivision or combination covered by Section 7(a) above) to which the Common Stock is effectively converted into or exchanged for other securities, cash or property (in any such case, a “**Fundamental Transaction**”), then, upon any subsequent conversion of this Series O Preferred Stock the Holders shall have the right to receive, in lieu of the right to receive Conversion Shares, for each Conversion Share that would have been issuable upon such conversion immediately prior to the occurrence of such Fundamental Transaction, the same kind and amount of securities, cash or property as it would have been entitled to receive upon the occurrence of such Fundamental Transaction if it had been, immediately prior to such Fundamental Transaction, the holder of one share of Common Stock (the “**Alternate Consideration**”). For purposes of any such subsequent conversion, the determination of the Conversion Ratio shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Corporation shall adjust the Conversion Ratio in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holders shall be given the same choice as to the Alternate Consideration it receives upon any conversion of this Series O Preferred Stock following such Fundamental Transaction. To the extent necessary to effectuate the foregoing provisions, any successor to the Corporation or surviving entity in such Fundamental Transaction shall file a new Certificate of Designation with the same terms and conditions and issue to the Holders new preferred stock consistent with the foregoing provisions and evidencing the Holders’ right to convert such preferred stock into Alternate Consideration. The terms of any agreement to which the Corporation is a party and pursuant to which a Fundamental Transaction is effected shall include terms requiring any such successor or surviving entity to comply with the provisions of this Section 7(b) and insuring that this Series O Preferred Stock (or any such replacement security) will be similarly adjusted upon any subsequent transaction analogous to a Fundamental Transaction. The Corporation shall cause to be delivered to each Holder, at its last address as it shall appear upon the stock books of the Corporation, written notice of any Fundamental Transaction at least 20 calendar days prior to the date on which such Fundamental Transaction is expected to become effective or close.

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

(d) Notice to the Holders.

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

(ii) Other Notices. If (A) the Corporation shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Corporation shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Corporation shall authorize the granting to all holders of the Common Stock of rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Corporation shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Corporation is a

party, any sale or transfer of all or substantially all of the assets of the Corporation, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property, or (E) the Corporation shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Corporation, then, in each case, the Corporation shall cause to be filed at each office or agency maintained for the purpose of conversion of this Series O Preferred Stock, and shall cause to be delivered to each Holder at its last address as it shall appear upon the stock books of the Corporation, at least 20 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange, provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice.

Section 8. Miscellaneous.

(a) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Conversion, shall be in writing and delivered personally, by facsimile, via email, or sent by a nationally recognized overnight courier service, addressed to the Corporation, at 3101 Western Avenue, Suite 800, Seattle, Washington 98121 attention David Kirske, with a copy to (which shall not constitute notice) to: O'Melveny & Myers LLP, Two Embarcadero Center, 28th Floor, San Francisco, California 94111, attention to C. Brophy Christensen, Esq. and Eric Sibbitt, Esq. or such other facsimile number, email address, or mailing address as the Corporation may specify for such purposes by notice to the Holders delivered in accordance with this Section. Any and all notices or other communications or deliveries to be provided by the Corporation hereunder shall be in writing and delivered personally, by facsimile, email, or sent by a nationally recognized overnight courier service addressed to each Holder at the facsimile number, email address or mailing address of such Holder appearing on the books of the Corporation, or if no such facsimile number, email address, or mailing address appears on the books of the Corporation, at the principal place of business of such Holder, with a copy to (which shall not constitute notice) to: Gibson, Dunn & Crutcher LLP, 555 Mission Street, Suite 3000, San Francisco, California 94105, attention to Ryan A Murr, Esq. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of: (i) the date of transmission, if such notice or communication is delivered via facsimile or email prior to 5:30 p.m. (New York City time) on any date, (ii) the date immediately following the date of transmission, if such notice or communication is delivered via facsimile or email between 5:30 p.m. and 11:59 p.m. (New York City time) on any date, (iii) the second Business Day following the date of mailing, if sent by nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given.

(b) Lost or Mutilated Series O Preferred Stock Certificate. If a Holder's Series O Preferred Stock certificate shall be mutilated, lost, stolen or destroyed, the Corporation shall execute and deliver, in exchange and substitution for and upon cancellation of a mutilated certificate, or in lieu of or in substitution for a lost, stolen or destroyed certificate, a new certificate for the shares of Series O Preferred Stock so mutilated, lost, stolen or destroyed, but only upon receipt of evidence of such loss, theft or destruction of such certificate, and of the ownership thereof, reasonably satisfactory to the Corporation and, in each case, customary and reasonable indemnity, if requested. Applicants for a new certificate

under such circumstances shall also comply with such other reasonable regulations and procedures and pay such other reasonable third-party costs as the Corporation may prescribe.

(c) Waiver. Any waiver by the Corporation or a Holder of a breach of any provision of this Certificate of Designation shall not operate as or be construed to be a waiver of any other breach of such provision or of any breach of any other provision of this Certificate of Designation or a waiver by any other Holders. The failure of the Corporation or a Holder to insist upon strict adherence to any term of this Certificate of Designation on one or more occasions shall not be considered a waiver or deprive that party (or any other Holder) of the right thereafter to insist upon strict adherence to that term or any other term of this Certificate of Designation. Any waiver by the Corporation or a Holder must be in writing. Notwithstanding any provision in this Certificate of Designation to the contrary, any provision contained herein and any right of the Holders of Series O Preferred Stock granted hereunder may be waived as to all shares of Series O Preferred Stock (and the Holders thereof) upon the written consent of the Holders of not less than a majority of the shares of Series O Preferred Stock then outstanding, unless a higher percentage is required by the DGCL, in which case the written consent of the Holders of not less than such higher percentage shall be required.

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

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

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

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

[Signature Page Follows]

IN WITNESS WHEREOF, the undersigned has executed this Certificate of Designation this 8th day of February, 2018.

/s/ David H. Kirske

Name: David Kirske

Title: Chief Financial Officer

ANNEX A

NOTICE OF CONVERSION

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

The undersigned Holder hereby irrevocably elects to convert the number of shares of Series O Preferred Stock indicated below, represented by stock certificate No(s). _____ (the "**Preferred Stock Certificates**"), into shares of common stock, no par value per share (the "**Common Stock**"), of CTI BioPharma Corp., a Delaware corporation (the "**Corporation**"), as of the date written below. If securities are to be issued in the name of a person other than the undersigned, the undersigned will pay all transfer taxes payable with respect thereto. Capitalized terms utilized but not defined herein shall have the meaning ascribed to such terms in that certain Certificate of Designation of Preferences, Rights and Limitations of Series O Convertible Preferred Stock (the "**Certificate of Designation**") filed by the Corporation with the Delaware Secretary of State on February [●], 2018.

As of the date hereof, the number of shares of Common Stock beneficially owned by the undersigned Holder (together with such Holder's Affiliates, and any other Person whose beneficial ownership of Common Stock would be aggregated with the Holder's for purposes of Section 13(d) or Section 16 of the Exchange Act and the applicable regulations of the Commission, including any "group" of which the Holder is a member (the foregoing, "**Attribution Parties**")), including the number of shares of Common Stock issuable upon conversion of the Series O Preferred Stock subject to this Notice of Conversion, but excluding the number of shares of Common Stock which are issuable upon (A) conversion of the remaining, unconverted Series O Preferred Stock beneficially owned by such Holder or any of its Attribution Parties, and (B) exercise or conversion of the unexercised or unconverted portion of any other securities of the Corporation (including any warrants) beneficially owned by such Holder or any of its Attribution Parties that are subject to a limitation on conversion or exercise similar to the limitation contained in Section 6(c) of the Certificate of Designation, is __%. For purposes hereof, beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the applicable regulations of the Commission. In addition, for purposes hereof, "group" has the meaning set forth in Section 13(d) of the Exchange Act and the applicable regulations of the Commission.

Conversion calculations:

Date to Effect

Conversion: _____

Number of shares of Series O Preferred Stock owned
prior to Conversion: _____

Number of shares of Series O Preferred Stock
to be Converted: _____

Number of shares of Common Stock to
be Issued:

Address for delivery of physical certificates:

or

for DWAC Delivery:

DWAC Instructions:

Broker no:

Account no:

HOLDER

By:

Name:

Title:

Date:

ZQ|CERT#|COY|CLS|RGSTRY|ACCT#|TRANSTYPE|RUN#|TRANS#

COMMON STOCK
PAR VALUE \$0.001

Certificate Number
ZQ00000000

Shares
*****000000*****
*****000000*****
*****000000*****
*****000000*****

CTI BIOPHARMA CORP.
INCORPORATED UNDER THE LAWS OF THE STATE OF DELAWARE

THIS CERTIFIES THAT

MR. SAMPLE & MRS. SAMPLE & MRS. SAMPLE & MRS. SAMPLE

is the owner of

*****ZERO HUNDRED THOUSAND ZERO HUNDRED AND ZERO*****

FULLY-PAID AND NON-ASSESSABLE SHARES OF COMMON STOCK, PAR VALUE \$0.001, OF

CTI BIOPHARMA CORP. (hereinafter called the "Corporation"), transferable only on the books of the Corporation by the holder hereof in person or by duly authorized Attorney, upon surrender of this Certificate properly endorsed. This Certificate is not valid until countersigned and registered by the Transfer Agent and Registrar.

In Witness Whereof, the said Corporation has caused this Certificate to be signed by its duly authorized officers and to be sealed with the Seal of the Corporation.


 Chief Executive Officer


 Chief Financial Officer



DATED **00-MMM-YY**
 COUNTERSIGNED AND REGISTERED BY:
COMPUTERSHARE TRUST COMPANY, N.A.
 TRANSFER AGENT AND REGISTRAR

By _____ AUTHORIZED SIGNATURE

SECURITY INSTRUCTIONS ON REVERSE

CTI Biopharma Corp.

PO BOX 40004, Providence, RI 02940-3004

MR. SAMPLE
ADD 1
ADD 2
ADD 3
ADD 4



CUSIP	Holder ID	Insurance Value	Number of Shares	DTC	Certificate Numbers	Num/No. Denom.	Total
1234567890	1234567890	1,000,000.00	123456	12345678	1234567890	1	1
1234567890	1234567890	1,000,000.00	123456	12345678	1234567890	2	2
1234567890	1234567890	1,000,000.00	123456	12345678	1234567890	3	3
1234567890	1234567890	1,000,000.00	123456	12345678	1234567890	4	4
1234567890	1234567890	1,000,000.00	123456	12345678	1234567890	5	5
1234567890	1234567890	1,000,000.00	123456	12345678	1234567890	6	6
1234567890	1234567890	1,000,000.00	123456	12345678	1234567890	7	7

1234567

CTI BIOPHARMA CORP.

This certificate also evidences and entitles the holder hereof to certain Rights as set forth in a Shareholder Rights Agreement between CTI Biopharma Corp. and Complishere Trust Company, N.A. (or any successor thereto), as Rights Agent, dated as of December 28, 2009, as amended heretofore and as may be further amended, restated, renewed, supplemented or extended from time to time (the "Rights Agreement"), the terms of which are hereby incorporated herein by reference and a copy of which is on file in the Rights Agent's office. The holder of this certificate shall be deemed to have accepted the terms of the Rights Agreement and a copy of which is on file in the Rights Agent's office. The holder of this certificate shall be deemed to have accepted the terms of the Rights Agreement. CTI Biopharma Corp. may redeem the Rights at a redemption price of \$0.0002 per Right, subject to adjustment, under the terms of the Rights Agreement. CTI Biopharma Corp. shall mail to the holder of this certificate a copy of the Rights Agreement, as in effect on the date of mailing, without charge promptly after receipt of a written request therefor. Under certain circumstances, Rights issued to or held by Acquiring Persons or any Affiliates or Associates thereof (as defined in the Rights Agreement), and any subsequent holder of such Rights, may become null and void. The Rights shall not be exercisable, and shall be void so long as they are held by a holder in any jurisdiction where the requisite qualification, if any, to the issuance of such holder, or the exercise by such holder, of the Rights in such jurisdiction shall not have been obtained or be obtainable.

The following abbreviations, when used in the inscription on the face of this certificate, shall be construed as though they were written out in full according to applicable laws or regulations:

TEN COM - as tenants in common
 TEN ENT - as tenants by the entirety
 JT TEN - as joint tenants with right of survivorship and not as tenants in common

UNIF GIFT MINACT Custodian (name)
 under Uniform Gifts to Minors Act (name)
 UNIF TRF MINACT Custodian (unit age) (name)
 under Uniform Transfers to Minors Act (name)

Additional abbreviations may also be used though not in the above list.

For value received, _____ hereby sell, assign and transfer unto _____

(PLEASE PRINT OR TYPEWRITE NAME AND ADDRESS, INCLUDING POSTAL ZIP CODE, OF ASSIGNEE)

of the common stock represented by the within Certificate, and do hereby irrevocably constitute and appoint _____ Shares

to transfer the said stock on the books of the within-named Corporation with full power of substitution in the premises. _____ Attorney

Dated: _____ 20 _____

Signature: _____

Signature: _____
 Notice: The signature to this assignment must correspond with the name as written upon the face of the certificate, in every particular, without alteration or enlargement, or any change whatever.

SIGNATURE GUARANTEE MEDALION GUARANTEE STAMP
 THE SIGNATURE IS GUARANTEED BY AN ESTATE GUARANTEE NETWORK BANK.
 SOURCE: GUARANTEE MEDALION PROGRAM PRESENT TO SEC RULE 17d-15

SECURITY INSTRUCTIONS
 THIS IS WATERMARKED PAPER. DO NOT ACCEPT WITHOUT CHECKING WATERMARK. HELD TO LIGHT TO VIEW BY WATERMARK.



The IRS requires that we report the cost basis of certain shares acquired after January 1, 2011. If your shares were covered by the signature guarantee, we have debited to the first 14 digit of the account number. If you did not specify a cost basis calculation method, we have debited to the first 14 digit of the account number. If you need additional information about cost basis, please contact your broker or advisor. If you do not keep in contact with us or do not have any shares, your property could become subject to state and federal property laws and transferred to the appropriate state.

1534291

February 12, 2018

CTI BioPharma Corp.
3101 Western Ave. Ste. 800
Seattle, WA 98121-3047

Re: Registration of Common Stock of CTI BioPharma Corp.

Ladies and Gentlemen:

We have acted as special counsel to CTI BioPharma Corp., a Delaware corporation (the "**Company**"), in connection with the issuance of 23,000,000 shares of the Company's common stock, par value \$0.001 per share pursuant to that certain Underwriting Agreement, dated February 8, 2018 (the "**Underwriting Agreement**"), between the Company and Leerink Partners LLC, as representative of the several underwriters named therein (collectively, the "**Underwriters**"). The Shares are being issued pursuant to the shelf registration statement on Form S-3 (File No. 333-221382) (the "**Registration Statement**"), filed by the Company with the Securities and Exchange Commission (the "**Commission**") under the Securities Act of 1933, as amended (the "**Securities Act**") and declared effective by the Commission on January 31, 2018, the base prospectus filed together with the Registration Statement (the "**Base Prospectus**"), and the prospectus supplement dated February 8, 2018 (the "**Prospectus Supplement**"). The Base Prospectus and the Prospectus Supplement are collectively referred to as the "**Prospectus**."

In our capacity as such counsel, we have examined originals or copies, certified or otherwise identified to our satisfaction, of such corporate and other records and documents as we considered necessary or appropriate for the purpose of rendering this opinion.

In our examination, we have assumed the genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as certified, conformed or photostatic copies and the authenticity of the originals of such documents. On the basis of such examination and subject to the limitations and assumptions in this opinion, we are of the opinion that the Shares have been duly authorized by all necessary corporate action on the part of the Company and, upon payment for and delivery of the Shares as contemplated by the Registration Statements and Prospectus, the Shares will be validly issued, fully paid and non-assessable.

The law covered by this opinion is limited to the present General Corporation Law of the State of Delaware. We express no opinion as to the laws of any other jurisdiction and no opinion regarding the statutes, administrative decisions, rules, regulations or requirements of any county, municipality, subdivision or local authority of any jurisdiction.

We hereby consent to the filing of this opinion as an exhibit to the Company's Current Report on Form 8-K dated February 12, 2018 and to the reference to this firm under the heading "Legal Matters" in the Prospectus. In signing this consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act.

Respectfully submitted,

/s/ O'Melveny & Myers LLP

STOCK EXCHANGE AGREEMENT

This **STOCK EXCHANGE AGREEMENT**, is dated as of February 8, 2018 (this "Agreement"), by and between CTI BIOPHARMA CORP., a Delaware corporation (the "Issuer") and BVF PARTNERS L.P. (the "Holder").

WHEREAS, the Issuer has outstanding, among other things, shares of Series O Preferred Stock, par value \$0.001 per share (the "Preferred Stock") with such designations, preferences and rights as set forth in the certificate of designation (the "Certificate of Designation") attached hereto as Exhibit A;

WHEREAS, the Holder currently owns 8,000,000 shares of common stock, par value \$0.001 per share, of the Issuer (the "Existing Common Stock");

WHEREAS, the Holder currently owns 575 shares of Series N preferred stock, par value \$0.001 per share, of the Issuer (the "Existing Series N Stock");

WHEREAS, pursuant to Board approval, the Holder and Issuer each desires for the Holder (i) to exercise its one-time election rights to exchange 6,843,938 shares of the Existing Common Stock for shares of Preferred Stock under the terms of those certain Letter Agreements dated December 9, 2015 and June 9, 2017, respectively, between the Issuer and the Holder (the "Letter Agreements"), and (ii) to exchange an additional 1,156,062 shares of the Existing Common Stock for shares of Preferred Stock (collectively, the "Common Stock Exchange");

WHEREAS, the Holder and Issuer each desires for the Holder to exchange the Existing Series N Stock for shares of Preferred Stock (the "Preferred Stock Exchange", and together with the Common Stock Exchange, the "Exchange"); and

WHEREAS, to effect the Exchange, the Holder will surrender the Existing Common Stock and the Existing Series N Stock in exchange for shares of the Preferred Stock in a manner expected to be exempt from registration under United States securities laws pursuant to Section 3(a)(9) of the Securities Act of 1933, as amended (the "Securities Act").

NOW, THEREFORE, in consideration of the premises and the mutual agreements and covenants hereinafter set forth, and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Issuer and the Holder hereby agree as follows:

ARTICLE I EXCHANGE

Section 1.1 Exchange. On the basis of the representations, warranties and agreements herein contained, but subject to the terms and conditions herein set forth, at the Closing (as defined below), (i) the Holder shall transfer to the Issuer the Existing Common Stock as set forth on Schedule I (ii) the Holder shall transfer to the Issuer the Existing Series N Stock as set forth on Schedule I, and (iii) in exchange for the transfer of Existing Common Stock and the Existing Series N Stock by the Holder, the Issuer shall issue to the Holder the Preferred Stock as set forth on Schedule I.

Thereafter, the Holder shall cease to have any further right, title or interest in and to the Existing Common Stock and Existing Series N Stock surrendered for exchange.

Section 1.2 Consideration. In exchange for each share of Existing Common Stock and Existing Series N Stock properly exchanged, the Holder will receive the respective Exchange Consideration as set forth on Schedule I. The amount of Preferred Stock issued to the Holder for all Existing Common Stock and all Existing Series N Stock exchanged by the Issuer will be rounded down, if necessary, to the nearest whole share of Preferred Stock. This rounded amount will be the number of shares of Preferred Stock the Holder will receive, and cash will be paid equal to the value of any shares or fractions of shares of Preferred Stock not received as a result of such rounding down. The Issuer shall issue and deliver to the Holder a certificate representing this rounded down number of shares of Preferred Stock, registered in the name of the Holder, and free and clear of any liens, claims, charges and encumbrances whatsoever and having the rights and privileges as set forth in the Certificate of Designation and other incidents of record and beneficial ownership pertaining thereto.

Section 1.3 Closing. The closing of the Exchange (the "Closing") shall take place at the offices of O'Melveny & Myers LLP, Two Embarcadero Center, 28th Floor, San Francisco, California 94111 within two (2) business days of the execution and delivery of this Agreement by each of the parties hereto (unless extended), provided that all of the conditions set forth in Article IV have been satisfied or waived, or at such time and place as the parties hereto shall agree.

Section 1.4 Deliverable of the Holder. At the Closing, the Holder will execute and deliver or cause to be executed and delivered to the Issuer: (i) certificates representing the Existing Common Stock to be cancelled in exchange for the Preferred Stock, (ii) certificates representing the Existing Series N Stock to be cancelled in exchange for the Preferred Stock and (ii) such other documents and instruments as the Issuer or its counsel and the Holder shall reasonably and mutually deem necessary to consummate the transactions contemplated by this Agreement.

Section 1.4 Deliverable of the Company. At the Closing, the Issuer will issue the Preferred Stock to the Holder. Such stock certificate will be delivered to the Holder promptly following the Closing.

ARTICLE II REPRESENTATIONS AND WARRANTIES OF THE ISSUER

Section 2.1 The Issuer represents and warrants to, and agrees with, the Holder that:

(a) The Issuer has been duly incorporated and is a validly existing corporation in good standing under the laws of the jurisdiction of its incorporation, with corporate power and authority to execute, deliver and perform the terms of this Agreement and to consummate the Exchange and has taken all necessary corporate action to authorize the execution, delivery and performance of this Agreement.

(b) No consent, approval, authorization, or order of, or filing with, any governmental agency or body or any court is required for the consummation of the transactions contemplated by

the Operative Documents in connection with the Exchange and issuance of the Preferred Stock, except (i) as may be required under the Securities Act, the Securities Exchange Act of 1934, as amended (the “Exchange Act”) or the regulations thereunder, or state securities “Blue Sky” laws in connection with the transactions contemplated hereby, (ii) such as will have been obtained on or prior to the Closing and (iii) for such consents, approvals, authorizations, or orders as to which the failure to obtain or have would not adversely affect the Holder and as to which the failure to obtain or have would not have a material adverse effect. The foregoing representation is made after reasonable consultation with counsel having responsibility for the matters covered thereby. “Operative Documents” means this Agreement, the Letter Agreements and the Certificate of Designation.

(c) This Agreement has been duly and validly executed and delivered by the Issuer and constitutes the legal, valid and binding obligation of the Issuer, enforceable against the Issuer in accordance with its terms.

(d) Neither the execution and delivery by the Issuer of this Agreement, the compliance by the Issuer with the terms and conditions hereof, nor the consummation by the Issuer of the transactions contemplated hereby will (i) violate, result in a breach of, or constitute a default under its constitutional or other governing documents, (ii) violate, result in a breach of, or constitute a default under (with or without notice or lapse of time, or both), in each case in any material respect, any agreement, instrument, judgment, order or decree to which the Issuer is a party or is otherwise bound or give to others any material rights or interests (including rights of purchase, termination, cancellation or acceleration) under any such agreement or instrument or (iii) conflict with or violate in any material respect any applicable laws. The execution, delivery and performance of this Agreement by the Issuer and the consummation of the transactions contemplated hereby do not and will not require any permit of, or filing with or notification to, any Governmental Entity except, as applicable, requirements under the Exchange Act and the rules and regulations promulgated thereunder. “Governmental Entity” means, in any jurisdiction, any (i) federal, state, local, foreign or international government; (ii) court, arbitral or other tribunal; (iii) governmental or quasi-governmental authority of any nature (including any political subdivision, instrumentality, branch, department, official or entity); or (iv) agency, commission, authority or body exercising, or entitled to exercise, any administrative, executive, judicial, legislative, police, regulatory or taxing authority or power of any nature.

(e) The Preferred Stock, when issued and delivered in accordance with the terms and conditions set forth in this Agreement, will be validly issued, fully paid nonassessable and free of restrictions on transfer other than restrictions on transfer provided for herein. Assuming the accuracy of the representations of the Holder made herein, the Preferred Stock will be issued in compliance with all applicable federal and state securities laws. The common stock, par value \$0.001, per share, issuable upon conversion of the Preferred Stock has been duly reserved for issuance, and upon issuance in accordance with the terms of the Certificate of Designation and other governing documents of the Company, will be validly issued, fully paid and nonassessable and free of restrictions on transfer other than restrictions on transfer provided for herein.

(f) Neither the Company nor any of its affiliates nor any person acting on behalf of or for the benefit of any of the forgoing, has paid or given, or agreed to pay or give, directly or indirectly, any commission or other remuneration (within the meaning of Section 3(a)(9) of the Securities Act and the rules and regulations of the Securities and Exchange Commission promulgated thereunder) for soliciting the Exchange. Assuming the representations and warranties of the Holder contained herein are true and complete, the Exchange will qualify for the registration exemption contained in Section 3(a)(9) of the Securities Act.

(g) As of the Closing, the Exchange, the Preferred Stock and the Certificate of Designation have been duly authorized by the Issuer, the Preferred Stock will have been duly issued and registered, as applicable, and will be entitled to the benefits provided in the Certificate of Designation, the Certificate of Designation shall have been filed with and accepted by the Delaware Secretary of State, and the Certificate of Designation and such Preferred Stock will constitute valid and legally binding obligations of the Issuer, enforceable against the Issuer in accordance with their terms, subject to bankruptcy, insolvency, fraudulent transfer, reorganization, moratorium and similar laws of general applicability relating to or affecting creditors' rights and to general equity principles.

ARTICLE III REPRESENTATIONS AND WARRANTIES OF THE HOLDER

Section 3.1 The Holder represents and warrants to, and agrees with, the Issuer that:

(a) The Holder has been duly organized and is in good standing under the laws of the jurisdiction of its organization, with company power and authority to execute, deliver and perform the terms of this Agreement and to consummate the Exchange and has taken all necessary company action to authorize the execution, delivery and performance of this Agreement.

(b) No consent, approval, authorization, or order of, or filing with, any governmental agency or body or any court is required for the consummation of the transactions contemplated by the Operative Documents in connection with the Exchange and issuance of the Preferred Stock, except (i) as may be required under the Securities Act, the Exchange Act or the regulations thereunder, state securities "Blue Sky" laws in connection with the transactions contemplated hereby, (ii) such as will have been obtained on or prior to the Closing and (iii) for such consents, approvals, authorizations, or orders as to which the failure to obtain or have would not adversely affect the Issuer and as to which the failure to obtain or have would not have a material adverse effect. The foregoing representation is made after reasonable consultation with counsel having responsibility for the matters covered thereby.

(c) This Agreement has been duly and validly executed and delivered by the Holder and constitutes the legal, valid and binding obligation of the Holder, enforceable against the Holder in accordance with its terms.

(d) Neither the execution and delivery by the Holder of this Agreement, the compliance by the Holder with the terms and conditions hereof, nor the consummation by the Holder of the transactions contemplated hereby will (i) violate, result in a breach of, or constitute a default under its constitutional or other governing documents, (ii) violate, result in a breach of, or constitute a

default under (with or without notice or lapse of time, or both), in each case in any material respect, any agreement, instrument, judgment, order or decree to which the Holder is a party or is otherwise bound or give to others any material rights or interests (including rights of purchase, termination, cancellation or acceleration) under any such agreement or instrument or (iii) conflict with or violate in any material respect any applicable laws. The execution, delivery and performance of this Agreement by the Holder and the consummation of the transactions contemplated hereby do not and will not require any permit of, or filing with or notification to, any Governmental Entity except, as applicable, requirements under the Exchange Act and the rules and regulations promulgated thereunder.

(e) The Holder and/or its affiliates are the lawful owners of record and beneficially of the Existing Common Stock and Existing Series N Stock listed next to its name on Schedule I, and have good and marketable title to the Existing Common Stock and Existing Series N Stock, free and clear of any encumbrances, except for encumbrances created by this Agreement. There are no contracts or other agreements between or among the Holder and any other person that would conflict with, restrict or prohibit the Holder's ability to exchange the Existing Common Stock or the Existing Series N Stock as described herein.

(f) Neither the Holder nor any of its affiliates nor any person acting on behalf of or for the benefit of any of the forgoing, has paid or given, or agreed to pay or give, directly or indirectly, any commission or other remuneration (within the meaning of Section 3(a)(9) of the Securities Act and the rules and regulations of the Securities and Exchange Commission promulgated thereunder) for soliciting the Exchange.

ARTICLE IV CONDITIONS TO CLOSING

Section 4.1 Conditions to the Obligations of the Issuer. The obligations of the Issuer to consummate the transactions contemplated by this Agreement are subject to the satisfaction or waiver, at or before the Closing, of each of the following conditions:

(a) Representations and Warranties. The representations and warranties of the Holder set forth in this Agreement that are qualified as to materiality shall be true and correct in all respects, and those that are not so qualified shall be true and correct in all material respects, on and as of the date hereof and on and as of the Closing as though made on and as of the Closing, other than for such failures to be true and correct, that individually and in the aggregate, would not reasonably be expected to have a material adverse effect on the Holder's ability to perform its obligations under this Agreement.

(b) Performance of Agreements. The Holder shall have performed and complied in all material respects with each agreement and obligation required by this Agreement to be performed or complied with by the Holder on or prior to the Closing.

(c) Closing Deliveries. The Holder shall have made the deliveries required to be made by it under Section 1.1.

Section 4.2 Conditions to the Obligations of the Holder. The obligations of the Holder to consummate the transactions contemplated by this Agreement are subject to the satisfaction or waiver, at or before the Closing, of each of the following conditions:

(a) **Representations and Warranties.** The representations and warranties of the Issuer set forth in this Agreement that are qualified as to materiality shall be true and correct in all respects, and those that are not so qualified shall be true and correct in all material respects, on and as of the date hereof and on and as of the Closing as though made on and as of the Closing, other than for such failures to be true and correct, that individually and in the aggregate, would not reasonably be expected to have a material adverse effect on the Issuer's ability to perform its obligations under this Agreement.

(b) **Performance of Agreements.** The Issuer shall have performed and complied in all material respects with each agreement and obligation required by this Agreement to be performed or complied with by the Issuer on or prior to the Closing.

(c) **Closing Deliveries.** The Issuer shall have made the deliveries or registrations, as applicable, required to be made by it under Section 1.1.

ARTICLE V SURVIVAL

Section 5.1 Survival. All representations and warranties of the Issuer under this Agreement shall not survive the Closing.

ARTICLE VI GENERAL

Section 6.1 Entire Agreement. This Agreement contains all of the agreements, covenants, terms, conditions and representations and warranties agreed upon by the parties relating to the subject matter hereof and supersedes all prior and contemporaneous agreements, negotiations, correspondence, undertakings, representations, warranties and communications of any kind between the parties and their representatives, whether oral or written, respecting such subject matter.

Section 6.2 Successors and Assigns. This Agreement shall be binding upon, inure to the benefit of, and be enforceable by, the parties hereto and their respective legal representatives, successors and assigns; *provided*, that no party may assign, delegate or otherwise transfer any of its rights or obligations under this Agreement without the prior written consent of each other party hereto.

Section 6.3 Governing Law. This Agreement shall be governed by, and construed in accordance with, the laws of the State of New York without regard to principles of conflicts of laws.

Section 6.4 Counterparts; Effectiveness. This Agreement may be executed and delivered (including by electronic or facsimile transmission) in one or more counterparts, and by

the different parties hereto in separate counterparts, each of which when executed shall be deemed to be an original but all of which taken together shall constitute one and the same agreement.

Section 6.5 Severability. If a court of competent jurisdiction rules that any provision of this Agreement is invalid, illegal or incapable of being enforced by any rule of law or public policy, the parties agree that this Agreement shall be considered severable and divisible, and a reviewing court shall have the authority to amend or “blue pencil” this Agreement so as to make it fully valid and enforceable.

Section 6.6 Expenses. All fees and expenses incurred in connection with the transactions contemplated hereby shall be the responsibility of the respective party incurring such fees and expenses.

Section 6.7 Notices. All notices and other communications provided for or permitted hereunder shall be in writing and shall be made by (a) United States registered or certified mail (return receipt requested), postage prepaid, in an envelope properly sealed, (b) a facsimile transmission where written acknowledgment of receipt of such transmission is received and a copy of the transmission is mailed with postage prepaid or (c) a nationally recognized overnight delivery service, in each case as follows:

(a) if to the Issuer:

CTI BioPharma Corp.
3101 Western Avenue, Suite 800
Seattle, WA 98121
Attention: Chief Financial Officer

with a copy (which shall not constitute notice) to:

O’Melveny & Myers LLP
Two Embarcadero Center, 28th Floor
San Francisco, California 94111
Attention: C. Brophy Christensen, Jr., Esq.
Eric C. Sibbitt, Esq.

(b) if to the Holder, to the address under the Holder’s name on the signature pages hereto.

with a copy (which shall not constitute notice) to:

Gibson, Dunn & Crutcher LLP
555 Mission Street, Suite 3000
San Francisco, California 94105
Attention: Ryan A. Murr, Esq.

Section 6.8 Remedies; Limitations.

(a) The parties agree that irreparable damage would occur in the event that any of the provisions of this Agreement were not performed in accordance with their specific terms or were otherwise breached. It is accordingly agreed that, in addition to being entitled to exercise all rights provided herein or granted by law, including recovery of damages, the Issuer, on the one hand, and the Holder, on the other hand, will be entitled to an injunction or injunctions to prevent breaches of this Agreement and to enforce specifically the terms and provisions of this Agreement. The parties agree to waive in any action for specific performance of any such obligation (other than in connection with any action for a temporary restraining order) the defense that a remedy at law would be adequate.

(b) The sole and exclusive remedy for breaches of representations and warranties set forth herein shall be the respective right to refuse to consummate one or more transactions contemplated herein, as applicable, in accordance with and subject to the conditions precedent set forth herein.

(c) Notwithstanding anything to the contrary herein, in any action, suit, claim or other proceeding hereunder or otherwise in connection with the transactions contemplated hereby, whether pursuant to claims under contract, tort, indemnification or any other theory, no party shall seek or be entitled to, and each party hereby knowingly and expressly disclaims the right to assert or receive, damages other than direct damages. In furtherance of the foregoing, the parties expressly disclaim, and shall not be entitled to recover, any indirect, incidental, special, exemplary, punitive or consequential damages or any damages measured by or based on diminution of value, lost profits, a multiple of earnings and/or future value of the Preferred Stock.

* * * * *

SCHEDULE I

Holder	Amount of Shares to be Exchanged	Type of Shares to be Exchanged	Exchange Consideration (per share of Existing Common Stock Exchanged)	Amount of Preferred Stock to be Issued (Rounded down to nearest whole Preferred Stock)
BVF Partners L.P.	8,000,000	Existing Common Stock	666.67	12,000
BVF Partners L.P.	575	Existing Series N Stock	1	575