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Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

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Large accelerated filer  Accelerated filer

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

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 7(a)(2)(B) of the Securities Act.

CALCULATION OF REGISTRATION FEE

| Title of Securities To Be Registered      | Amount To Be Registered(1)(2) | Proposed Maximum Offering Price Per Share(3) | Proposed Maximum Aggregate Offering Price(3) | Amount of Registration Fee(3) |
|---|-------------------------------|--|--|-------------------------------|
| Common Stock, \$0.001 par value per share | 1,800,000 shares              | N/A  | N/A  | N/A                           |

This Registration Statement covers, in addition to the number of shares of CTI BioPharma Corp., a Delaware corporation (the “Company” or the “Registrant”), common stock, \$0.001 par value per share (the “Common Stock”), stated above, options and other rights to purchase or acquire the shares of Common Stock covered by this Registration Statement and, pursuant to Rule 416(a) under the Securities Act of 1933, as amended (the “Securities Act”), an additional indeterminate number of shares, options and rights that may be offered or issued pursuant to the CTI BioPharma Corp. 2015 Equity Incentive Plan, as amended and restated, and the CTI BioPharma Corp. 2017 Equity Incentive Plan (the “Plans”) as a result of one or more adjustments under the Plans to prevent dilution resulting from one or more stock splits, stock dividends or similar transactions.

Each share of Common Stock is accompanied by a preferred stock purchase right pursuant to the Shareholder Rights Agreement, dated as of December 28, 2009, between the Company and Computershare Trust Company, N.A., as Rights Agent, and as subsequently amended.

No additional securities are being registered. The registration fees were paid upon filing of the original Registration Statement on Form S-8 (Commission File No. 333-211006) on April 29, 2016. Therefore, no further registration fee is required.

The Exhibit Index for this Registration Statement is at page 9.

#### EXPLANATORY NOTE

On January 24, 2018, the shareholders of CTI BioPharma Corp., a Washington corporation (the “Predecessor Registrant”), approved the reincorporation of the Predecessor Registrant from the State of Washington to the State of Delaware. The Predecessor Registrant and the Company entered into a merger agreement in connection with the reincorporation. Pursuant to the merger agreement, on January 24, 2018, the Predecessor Registrant merged with and into the Company, with the Predecessor Registrant ceasing to exist and the Company being the surviving corporation of such merger. Each outstanding share of the Predecessor Registrant’s common stock was converted into one share of the Company’s Common Stock, and the Company succeeded to and continues to operate, directly or indirectly, substantially all of the prior business of the Predecessor Registrant. As a consequence of the merger, each right to receive one share of the Predecessor Registrant’s common stock pursuant to the Plans was converted into the right to receive one share of Common Stock of the Company.

This Post-Effective Amendment No. 2 to Registration Statement on Form S-8 (Commission File No. 333-211006), filed with the Securities and Exchange Commission (the “Commission”) on April 29, 2016, by the Predecessor Registrant (as amended, the “Registration Statement”), relating to the Plans, is being filed by the Registrant pursuant to Rule 414 under the Securities Act as the successor issuer to the Predecessor Registrant following the reorganization. In accordance with Rule 414(d) under the Securities Act, the Registrant, as the successor issuer to the Predecessor Registrant, hereby expressly adopts the Registration Statement as its own for all purposes of the Securities Act and the Securities Exchange Act of 1934, as amended (the “Exchange Act”).

A total of 18,000,000 shares of the Predecessor Registrant’s common stock was initially registered pursuant to this Registration Statement, as filed with the Commission on April 29, 2016. The number of shares of Common Stock reflected on the cover page of this Registration Statement (1,800,000) is presented after giving effect to (1) the Predecessor Registrant’s January 3, 2017 one-for-ten (1:10) reverse stock split and (2) the assumption of the Plans by the Company and the conversion of rights to acquire common stock under the Plans as described above.

**PART I**

**INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS**

The document(s) containing the information specified in Part I of Form S-8 will be sent or given to participants as specified by Securities Act Rule 428(b)(1).

3

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PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Certain Documents by Reference

The following documents of the Company (as successor to the Predecessor Registrant) filed with the Securities and Exchange Commission (the "Commission") are incorporated herein by reference (other than those documents or the portions of those documents deemed to be furnished and not filed in accordance with Commission rules):

a) The Company's Annual Report on Form 10-K for its fiscal year ended December 31, 2016, filed with the Commission on March 2, 2017 (Commission File No. 000-28386);

b) The Company's Quarterly Reports on Form 10-Q for its fiscal quarters ended March 31, 2017, June 30, 2017 and September 30, 2017, filed with the Commission on May 3, 2017, August 4, 2017 and November 7, 2017, respectively (each, Commission File No. 000-28386);

c) The Company's Current Reports on Form 8-K, filed with the Commission on January 5, 2017, January 20, 2017, January 24, 2017, February 10, 2017, February 27, 2017 (with respect to Item 5.02 only), March 13, 2017, April 25, 2017 (with respect to Item 1.01 only), May 16, 2017 (with respect to Items 5.02 and 5.07 only and as amended on Form 8-K/A filed on June 16, 2017), June 5, 2017 (with respect to Item 5.02 only), June 9, 2017, July 24, 2017 (with respect to Item 5.02 only), August 22, 2017, September 26, 2017, November 28, 2017, December 5, 2017, December 15, 2017 and January 24, 2018 (each, Commission File No. 000-28386);

d) The description of the Company's Common Stock contained in its Registration Statement on Form 10 filed with the Commission on June 27, 1996, as amended (Commission File No. 000-28386), and any other amendment or report filed for the purpose of updating such description; and

e) The description of the Company's Preferred Stock Purchase Rights contained in its Registration Statement on Form 8-A filed with the Commission on December 28, 2009 (Commission File No. 001-12465), as amended by Amendment No. 1. to Form 8-A filed with the Commission on May 17, 2011 (Commission File No. 001-12465), and Registration Statement on Form 8-A filed with the Commission on September 6, 2012 (Commission File No. 000-28386), as amended by Amendment No. 1 to Form 8-A filed with the Commission on December 7, 2012 (Commission File No. 000-28386), Amendment No. 2 to Form 8-A filed with the Commission on December 1, 2015 (Commission File No. 000-28386), Amendment No. 3 to Form 8-A filed with the Commission on January 3, 2017 (Commission File No. 000-28386), and Amendment No. 4 to Form 8-A filed with the Commission on September 26, 2017 (Commission File No. 000-28386), and any other amendment or report filed for the purpose of updating such description.

All documents subsequently filed by the Company pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act, prior to the filing of a post-effective amendment which indicates that all securities offered hereby have been sold or which deregisters all securities then remaining unsold, shall be deemed to be incorporated by reference into this Registration Statement and to be a part hereof from the date of filing of such documents; provided, however, that documents or information deemed to have been furnished and not filed in accordance with Commission rules shall not be deemed incorporated by reference into this Registration Statement.

Any statement contained herein or in a document, all or a portion of which is incorporated or deemed to be incorporated by reference herein, shall be deemed to be modified or superseded for purposes of this Registration Statement to the extent that a statement contained herein or in any other subsequently filed document which also is or is deemed to be incorporated by reference herein modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or amended, to constitute a part of this Registration Statement.

Item 4. Description of Securities

Not applicable.

Item 5. Interests of Named Experts and Counsel  
Not applicable.

4

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Item 6. Indemnification of Directors and Officers

Section 145 of the Delaware General Corporation Law (“DGCL”) provides, generally, that a corporation shall have the power to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding (except actions by or in the right of the corporation) by reason of the fact that such person is or was a director, officer, employee or agent of the corporation against all expenses, judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding if such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the corporation and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful. A corporation may similarly indemnify such person for expenses actually and reasonably incurred by such person in connection with the defense or settlement of any action or suit by or in the right of the corporation, provided that such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation, and, in the case of claims, issues and matters as to which such person shall have been adjudged liable to the corporation, provided that a court shall have determined, upon application, that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which such court shall deem proper.

Section 102(b)(7) of the DGCL provides, generally, that a corporation’s certificate of incorporation may contain a provision eliminating or limiting the personal liability of a director to the corporation or its shareholders for monetary damages for breach of fiduciary duty as a director, provided that such provision may not eliminate or limit the liability of a director (i) for any breach of the director’s duty of loyalty to the corporation or its shareholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the DGCL, or (iv) for any transaction from which the director derived an improper personal benefit. No such provision may eliminate or limit the liability of a director for any act or omission occurring prior to the date when such provision became effective.

Article IX of the Registrant’s certificate of incorporation contains provisions implementing, to the fullest extent permitted by Delaware law, such limitations on a director’s liability to the registrant and its shareholders. Article IX also provides that no amendment or repeal of such Article shall adversely affect any right or protection of a director for or with respect to any acts or omissions of such director occurring prior to such amendment or repeal.

Article IX of the Registrant’s bylaws provide for, among other things, the indemnification by the registrant of its directors, officers, employees and agents and the advancement of expenses. The Registrant has entered into an indemnification agreement with each of its executive officers and directors in which the Registrant agrees to hold harmless and indemnify the officer or director to the fullest extent permitted by Delaware law.

The directors and officers of the Registrant also may be indemnified against liability they may incur for serving in such capacity pursuant to a liability insurance policy the Registrant maintains for such purpose.

Item 7. Exemption from Registration Claimed

Not applicable.

Item 8. Exhibits

See the attached Exhibit Index at page 9, which is incorporated herein by reference.

Item 9. Undertakings

(a) The undersigned Registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this Registration Statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act;

(ii) To reflect in the prospectus any facts or events arising after the effective date of this Registration Statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental

change in the information set forth in this Registration Statement;

(iii) To include any material information with respect to the plan of distribution not previously disclosed in this Registration Statement or any material change to such information in this Registration Statement;

5

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provided, however, that paragraphs (a)(1)(i) and (a)(1)(ii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the Registrant pursuant to Section 13 or 15(d) of the Exchange Act that are incorporated by reference in this Registration Statement.

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

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

(b) The undersigned Registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the Registrant's annual report pursuant to Section 13(a) or 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in this Registration Statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(h) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Registrant pursuant to the provisions described in Item 6 above, or otherwise, the Registrant has been advised that in the opinion of the Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

**SIGNATURES**

Pursuant to the requirements of the Securities Act, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Post-Effective Amendment No. 2 to Form S-8 Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Seattle, State of Washington, on January 24, 2018.

CTI BIOPHARMA CORP.

By: /s/ Adam R. Craig  
Adam R. Craig  
President and Chief Executive Officer

7

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## POWER OF ATTORNEY

Each person whose signature appears below constitutes and appoints Adam R. Craig, M.D., Ph.D. and David H. Kirske, and each of them, acting individually and without the other, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place, and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments, exhibits thereto and other documents in connection therewith) to this Registration Statement, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or either of them individually, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act, this Registration Statement has been signed below by the following persons in the capacities and on the dates indicated.

| Signature  | Title  | Date                |
|--|--|---------------------|
| /s/ Adam R. Craig<br>Adam R. Craig, M.D.,<br>Ph.D.         | President, Chief Executive Officer and Director (Principal Executive Officer)          | January 24,<br>2018 |
| /s/ David H. Kirske<br>David H. Kirske                     | Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer) | January 24,<br>2018 |
| /s/ Laurent Fischer<br>Laurent Fischer, M.D.               | Director   | January 24,<br>2018 |
| /s/ Richard Love<br>Richard L. Love                        | Director   | January 24,<br>2018 |
| /s/ Michael Metzger<br>Michael A. Metzger                  | Director   | January 24,<br>2018 |
| /s/ David Parkinson<br>David Parkinson, M.D.               | Director   | January 24,<br>2018 |
| /s/ Matthew D. Perry<br>Matthew D. Perry                   | Director   | January 24,<br>2018 |
| /s/ Frederick W. Telling<br>Frederick W. Telling,<br>Ph.D. | Director   | January 24,<br>2018 |

/s/ Reed V. Tuckson      Director  
Reed V. Tuckson, M.D.

January 24,  
2018

8

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EXHIBIT INDEX

| Exhibit Number | Description of Exhibit  |
|----------------|---|
| 4.1            | <u>CTI BioPharma Corp. 2015 Equity Incentive Plan, as amended and restated. (Filed as Exhibit 10.1 to the Predecessor Registrant's Current Report on Form 8-K filed on April 29, 2016 (Commission File No. 000-28386) and incorporated herein by this reference.)</u> |
| 4.2            | <u>CTI BioPharma Corp. 2017 Equity Incentive Plan. (Filed as Exhibit 10.1 to the Predecessor Registrant's Current Report on Form 8-K filed on May 16, 2017 (Commission File No. 000-28386) and incorporated herein by this reference.)</u>                            |
| 5              | <u>Opinion of O'Melveny &amp; Myers LLP (opinion re: legality).</u>   |
| 23.1           | <u>Consent of Marcum LLP (consent of independent registered public accounting firm).</u>  |
| 23.2           | <u>Consent of Counsel (included in Exhibit 5).</u>  |
| 24             | Power of Attorney (included in this Registration Statement under "Signatures").   |