
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): **October 25, 2017**

Idera Pharmaceuticals, Inc.

(Exact Name of Registrant as Specified in Charter)

Delaware
(State or Other Jurisdiction
of Incorporation)

001-31918
(Commission
File Number)

04-3072298
(IRS Employer
Identification No.)

167 Sidney Street
Cambridge, Massachusetts 02139
(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code: **(617) 679-5500**

(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))

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

Emerging growth company

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

Item 1.01. Entry into a Material Definitive Agreement.

On October 25, 2017, Idera Pharmaceuticals, Inc. (the "Company") entered into an underwriting agreement (the "Underwriting Agreement") with J.P. Morgan Securities LLC, Goldman Sachs & Co. LLC and Barclays Capital Inc. as representatives of the several underwriters (collectively, the "Underwriters"), relating to an underwritten public offering of 33,333,334 shares of the Company's common stock, par value \$0.001 per share (the "Common Stock"). The public offering price for the Common Stock is \$1.50 per share. The Underwriters have agreed to purchase the shares pursuant to the Underwriting Agreement at a price of \$1.41 per share. The Company has also granted to the Underwriters a 30-day option to purchase up to an additional 5,000,000 shares of Common Stock at the same price per share. All of the shares in the offering are to be sold by the Company.

The Common Stock will be issued pursuant to a prospectus supplement dated October 25, 2017 and an accompanying base prospectus dated September 8, 2017 that form a part of the registration statement on Form S-3 that the Company filed with the Securities and Exchange Commission, which became effective September 8, 2017 (File No. 333-219851). The Company expects that the closing of the sale of the Common Stock will take place on October 30, 2017, subject to the satisfaction of customary closing conditions.

A copy of the Underwriting Agreement is attached as Exhibit 1.1 hereto and is incorporated herein by reference. The foregoing description of the Underwriting Agreement does not purport to be complete and is qualified in its entirety by reference to Exhibit 1.1.

A copy of the legal opinion and consent of Wilmer Cutler Pickering Hale and Dorr LLP relating to the validity of the Common Stock to be issued in the offering is attached as Exhibit 5.1 hereto.

Item 8.01. Other Events.

The Company issued a press release on October 26, 2017 announcing the pricing of the sale of the Common Stock. The full text of the press release is attached as Exhibit 99.1 hereto and is incorporated herein by reference.

Item 9.01. Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Description
1.1	Underwriting Agreement, dated as of October 25, 2017, between the Company and J.P. Morgan Securities LLC, Goldman Sachs & Co. LLC and Barclays Capital Inc.
5.1	Opinion of Wilmer Cutler Pickering Hale and Dorr LLP
23.1	Consent of Wilmer Cutler Pickering Hale and Dorr LLP (included in Exhibit 5.1)
99.1	Press Release dated October 26, 2017

SIGNATURE

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

Idera Pharmaceuticals, Inc.

Date: October 26, 2017

By: /s/ Louis J. Arcudi, III
Louis J. Arcudi, III
Senior Vice President of Operations, Chief Financial Officer and Treasurer

Idera Pharmaceuticals, Inc.

Common Stock

Underwriting Agreement

October 25, 2017

J.P. Morgan Securities LLC
 Goldman Sachs & Co. LLC
 Barclays Capital Inc.

As Representatives of the several Underwriters
 named in Schedule I hereto,

c/o J.P. Morgan Securities LLC
 383 Madison Avenue
 New York, NY 10179

c/o Goldman Sachs & Co. LLC
 200 West Street,
 New York, New York 10282

c/o Barclays Capital Inc.
 745 Seventh Avenue
 New York, New York 10019

Ladies and Gentlemen:

Idera Pharmaceuticals, Inc., a Delaware corporation (the “Company”), proposes, subject to the terms and conditions stated herein, to issue and sell to the Underwriters named in Schedule I hereto (the “Underwriters”) an aggregate of 33,333,334 shares (the “Firm Shares”) and, at the election of the Underwriters, up to 5,000,000 additional shares (the “Optional Shares”) of Common Stock, par value \$0.001 (“Stock”), of the Company (the Firm Shares and the Optional Shares that the Underwriters elect to purchase pursuant to Section 2 hereof being collectively called the “Shares”).

1. The Company represents and warrants to, and agrees with, each of the Underwriters that:

(a) A registration statement on Form S-3 (File No. 333-219851) (the “Initial Registration Statement”) in respect of the Shares has been filed with the Securities and Exchange Commission (the “Commission”); the Initial Registration Statement as amended at the time it became effective and any post-effective amendment thereto, each in the form filed with the Commission pursuant to its Electronic Data Gathering, Analysis and Retrieval System, and including all documents incorporated by reference in the prospectus contained therein, have been declared effective by the Commission in such form; other than (i) the documents incorporated by reference therein, (ii) the documents and information otherwise deemed to be a part thereof or included therein by Rule 430A or Rule 430B under the Securities Act of 1933, as amended (the “Act”), and (iii) a registration statement, if any, increasing the size of the offering (a “Rule 462(b) Registration Statement”) filed pursuant to Rule 462(b) under the Act which became effective upon filing, no other document with respect to the Initial Registration Statement has heretofore been filed with the Commission; and no stop order suspending the effectiveness of the Initial Registration Statement, any post-effective amendment thereto or the Rule 462(b) Registration Statement, if any, has been issued and no proceeding for that purpose or pursuant to Section 8A of the Act has been initiated or, to the knowledge of the Company, threatened by the Commission (any preliminary prospectus included in the Initial Registration Statement (including any preliminary prospectus supplement relating to the Shares filed pursuant to Rule 424(b) under the Act) or filed with the Commission pursuant to Rule 424(a) under the Act is hereinafter called a “Preliminary Prospectus”; the various parts of the Initial Registration Statement and the Rule 462(b) Registration Statement, if any, including all exhibits thereto and including the information contained in the form of final prospectus (including any final prospectus supplement relating to the Shares) filed with the Commission pursuant to Rule 424(b) under the Act in accordance with Section 5(a) hereof and deemed by virtue of Rule 430A or Rule 430B under the Act to be part of the Initial Registration Statement at the time it was declared effective, each as amended at the time such part of the Initial Registration Statement became effective or such part of the Rule 462(b) Registration Statement, if any, became or hereafter becomes effective, are hereinafter collectively called the “Registration Statement”; the Preliminary Prospectus relating to the Shares (including any preliminary prospectus supplement relating to the Shares filed pursuant to Rule 424(b) under the Act) that was included in the Registration Statement immediately prior to the Applicable Time (as defined in Section 1(c) hereof) is hereinafter called the “Pricing Prospectus”; and such final prospectus (including any final prospectus supplement relating to the Shares), in the form first filed pursuant to Rule 424(b) under the Act, is hereinafter called the “Prospectus”; any reference herein to any Preliminary Prospectus, the Pricing Prospectus or the Prospectus shall be

deemed to refer to and include the documents incorporated by reference therein pursuant to Item 12 of Form S-3 under the Act, as of the date of such prospectus; and any reference to any amendment or supplement to any Preliminary Prospectus or the Prospectus shall be deemed to refer to and include any documents filed after the date of such Preliminary Prospectus or Prospectus, as the case may be, under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and incorporated therein; any reference to any amendment to the Registration Statement shall be deemed to refer to and include any annual report of the Company filed pursuant to Section 13(a) or 15(d) of the Exchange Act after the effective date of the Initial Registration Statement that is incorporated by reference in the Registration Statement; and any “issuer free writing prospectus” as defined in Rule 433 under the Act relating to the Shares and listed on Schedule II(b) is hereinafter called an “Issuer Free Writing Prospectus”; and the Pricing Prospectus, together with the information included in

Schedule II(a) hereto, including each Issuer Free Writing Prospectus filed by the Company pursuant to Rule 433 under the Act that is listed on Schedule II(a), is hereinafter called the "Pricing Disclosure Package";

(b) No order preventing or suspending the use of any Preliminary Prospectus or any Issuer Free Writing Prospectus has been issued by the Commission, and each Preliminary Prospectus, at the time of filing thereof, conformed in all material respects to the requirements of the Act and the rules and regulations of the Commission thereunder, and did not contain an 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; provided, however, that this representation and warranty shall not apply to any statements or omissions made in reliance upon and in conformity with information furnished in writing to the Company by an Underwriter through the Representatives expressly for use therein;

(c) For the purposes of this Agreement, the "Applicable Time" is 10:00 pm (Eastern time) on the date of this Agreement. The Pricing Disclosure Package, as of the Applicable Time, did not include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; and each Issuer Free Writing Prospectus listed on Schedule II(b) hereto does not conflict with the information contained in the Registration Statement, the Pricing Prospectus or the Prospectus and each such Issuer Free Writing Prospectus, as supplemented by and taken together with the Pricing Disclosure Package as of the Applicable Time, did not include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided, however, that this representation and warranty shall not apply to statements or omissions made in an Issuer Free Writing Prospectus in reliance

3

upon and in conformity with information furnished in writing to the Company by an Underwriter through the Representatives expressly for use therein;

(d) The documents incorporated by reference in the Pricing Prospectus and the Prospectus, when they became effective or were filed with the Commission, as the case may be, conformed in all material respects to the requirements of the Act or the Exchange Act, as applicable, and the rules and regulations of the Commission thereunder, and none of such documents, when they became effective or were filed with the Commission, as the case may be, 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; and any further documents so filed and incorporated by reference in the Prospectus or any further amendment or supplement thereto, when such documents become effective or are filed with the Commission, as the case may be, will conform in all material respects to the requirements of the Act or the Exchange Act, as applicable, and the rules and regulations of the Commission thereunder and will not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading; provided, however, that this representation and warranty shall not apply to any statements or omissions made in reliance upon and in conformity with information furnished in writing to the Company by an Underwriter through the Representatives expressly for use therein; and no such documents were filed with the Commission since the Commission's close of business on the business day immediately prior to the date of this Agreement and prior to the execution of this Agreement;

(e) The Registration Statement conforms, and the Prospectus and any further amendments or supplements to the Registration Statement and the Prospectus will conform, in all material respects to the requirements of the Act and the rules and regulations of the Commission thereunder and do not and will not, as of the applicable effective date as to each part of the Registration Statement and as of the applicable filing date as to the Prospectus and any amendment or supplement thereto and as of each Time of Delivery (as defined in Section 4 hereof), contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading; provided, however, that this representation and warranty shall not apply to any statements or omissions made in reliance upon and in conformity with information furnished in writing to the Company by an Underwriter through the Representatives expressly for use therein;

(f) Since the date of the latest audited financial statements included or incorporated by reference in the Pricing Prospectus, the Company has not sustained any material loss or interference with its business from fire, explosion, flood or other calamity, whether or not covered by insurance, or from any labor dispute or court or governmental action, order or decree, otherwise than as set forth or contemplated in the Pricing Prospectus; and, since the respective dates

4

as of which information is given in the Registration Statement and the Pricing Prospectus, there has not been any change in the capital stock (other than pursuant to the conversion, exchange or exercise of convertible, exchangeable or exercisable securities, including without limitation preferred stock, options and warrants, and grant of equity incentives, in each case in the ordinary course of business) or increase in long-term debt of the Company, or any material adverse change, or any development involving a prospective material adverse change, in or affecting the general affairs, management, financial position, stockholders' equity or results of operations of the Company (a "Material Adverse Effect"), otherwise than as set forth or contemplated in the Pricing Prospectus;

(g) The Company has good and marketable title in fee simple to all real property and good and marketable title to all personal property (other than to Intellectual Property, which is addressed in Section 1(x) hereof) owned by them, in each case free and clear of all liens, encumbrances and defects except such as are described in the Pricing Prospectus or such as would not, individually or in the aggregate, have a Material Adverse Effect; and any real property and buildings held under lease by the Company are, to the knowledge of the Company, held by the Company under valid, subsisting and enforceable leases with such exceptions as are not material and do not interfere with the use made and proposed to be made of such property and buildings by the Company;

(h) The Company has been duly incorporated and is validly existing as a corporation in good standing under the laws of the State of Delaware, with power and authority (corporate and other) to own its properties and conduct its business as described in the Pricing Prospectus, and has been duly qualified as a foreign corporation for the transaction of business and is in good standing under the laws of each other jurisdiction in which it owns or leases properties or conducts any business so as to require such qualification, except to the extent that the failure to be so qualified or in good standing in any such jurisdiction would not have a Material Adverse Effect;

(i) This Agreement has been duly authorized, executed and delivered by the Company;

(j) The Company has an authorized capitalization as set forth in the Pricing Prospectus and all of the issued shares of capital stock of the Company have been duly authorized and validly issued and are fully paid and non-assessable and conform in all material respects to the description of the Stock contained in the Pricing Disclosure Package and Prospectus; and the Company does not have any subsidiaries.

(k) The Shares to be issued and sold by the Company to the Underwriters hereunder have been duly authorized and, when issued and delivered against payment therefor in accordance with the terms of this Agreement, will be validly issued and fully paid and non-assessable and will conform to the description of the Stock contained in the Registration Statement,

5

the Pricing Prospectus and the Prospectus; and the issuance of the Shares is not subject to any preemptive or similar rights that have not been waived or complied with;

(l) The issue and sale of the Shares and the execution, delivery and compliance by the Company with this Agreement and the consummation of the transactions herein contemplated will not (i) conflict with or result in a breach or violation of any of the terms or provisions of, or constitute a default under, any indenture, mortgage, deed of trust, loan agreement or other agreement or instrument to which the Company is a party or by which the Company is bound or to which any of the property or assets of the Company is subject, other than any conflict, breach, violation or default that would not, individually or in the aggregate, have a Material Adverse Effect or impair the ability of the Company to consummate the transactions herein contemplated, (ii) result in any violation of the provisions of the Certificate of Incorporation or By-laws of the Company or (iii) result in any violation of any statute or any order, rule or regulation of any court or governmental agency or body having jurisdiction over the Company or any of the Company's properties, except where such violation would not, individually or in the aggregate, have a Material Adverse Effect or impair the ability of the Company to consummate the transactions herein contemplated; and no consent, approval, authorization, order, registration or qualification of or with any such court or governmental agency or body is required for the issue and sale of the Shares or the consummation by the Company of the transactions contemplated by this Agreement, except the registration under the Act of the Shares and such consents, approvals, authorizations, registrations or qualifications as may be required under state securities, Blue Sky laws or by the bylaws and rules and regulations of the Financial Industry Regulatory Authority ("FINRA") in connection with the purchase and distribution of the Shares by the Underwriters;

(m) The Company is not in violation of its Certificate of Incorporation or By-laws or in default in the performance or observance of any material obligation, covenant or condition contained in any indenture, mortgage, deed of trust, loan agreement, lease or other agreement or instrument to which it is a party or by which it or any of its properties may be bound;

(n) The statements set forth in the Pricing Prospectus and Prospectus under the caption "Description of Capital Stock", insofar as they purport to constitute a summary of the terms of the Stock and under the caption "Underwriting", insofar as they purport to describe the provisions of the laws and documents referred to therein, are accurate in all material respects and fairly summarize such terms and describe such provisions in all material respects;

(o) Other than as set forth in the Pricing Prospectus, there are no legal or governmental proceedings pending to which the Company or, to the Company's knowledge, any officer or director of the Company is a party or of which any property or assets of the Company is the subject which would reasonably be

6

expected, individually or in the aggregate, to have a Material Adverse Effect or impair the ability of the Company to consummate the transactions herein contemplated; and, to the Company's knowledge, no such proceedings are threatened or contemplated by governmental authorities or threatened by others;

(p) The Company has filed all material Federal, state, local and foreign tax returns which are required to be filed through the date hereof, which returns are true and correct in all material respects or has received timely extensions thereof, and has paid all taxes shown on such returns and all assessments received by it to the extent that the same are material and have become due (and are not being contested). There are no tax audits or investigations pending which would reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect; nor are there any material proposed additional tax assessments against the Company;

(q) The Company is not, and immediately after giving effect to the offering and sale of the Shares and the application of the proceeds thereof as disclosed in the Pricing Disclosure Package and Prospectus, will not be an "investment company", as such term is defined in the Investment Company Act of 1940, as amended (the "Investment Company Act");

(r) At the time of filing the Initial Registration Statement the Company was not and is not an "ineligible issuer," as defined under Rule 405 under the Act;

(s) Ernst & Young LLP, who have certified certain financial statements of the Company, and, for the Company's fiscal years 2007 through 2011, and 2014 through 2016, have audited the Company's internal control over financial reporting and management's assessment thereof and whose reports appear or are incorporated by reference in the Registration Statement, the Pricing Prospectus or the Prospectus are independent public accountants as required by the Act and the rules and regulations of the Commission thereunder;

(t) The financial statements of the Company (including all notes and schedules thereto) included in the Registration Statement and the Pricing Prospectus present fairly the financial position of the Company at the dates indicated and the statement of operations, stockholders' equity and cash flows of the Company for the periods specified and such financial statements and related schedules and notes thereto, and the unaudited financial information filed with the Commission as part of the Registration Statement and the Pricing Prospectus, have been prepared in conformity with generally accepted accounting principles, consistently applied throughout the periods involved, except that unaudited financial statements may not contain certain information and footnote disclosure required by generally accepted accounting principles. The other financial information included or incorporated by reference in the Registration Statement, the Pricing Disclosure Package and the Prospectus has been derived from the accounting records of the Company and presents fairly the information shown thereby; and the interactive data in eXtensible Business Reporting Language

7

included or incorporated by reference in the Registration Statement fairly presents the information called for in all material respects and has been prepared in accordance with the Commission's rules and guidelines applicable thereto;

(u) The Company maintains a system of internal control over financial reporting (as such term is defined in Rule 13a-15(f) under the Exchange Act) that complies with the requirements of the Exchange Act and has been designed by the Company's principal executive officer and principal financial officer, or under their supervision, to provide reasonable assurance that the reliability of financial reporting and the preparation of financial statements for external purposes is in accordance with generally accepted accounting principles. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, there are no material weaknesses in the Company's internal controls. The Company's internal control over financial reporting is effective and the Company is not aware of any material weaknesses in its internal control over financial reporting;

(v) Since the date of the latest audited financial statements included or incorporated by reference in the Pricing Prospectus, there has been no change in the Company's internal control over financial reporting that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting;

(w) The Company maintains disclosure controls and procedures (as such term is defined in Rule 13a-15(e) under the Exchange Act) that comply with the requirements of the Exchange Act; such disclosure controls and procedures have been designed to ensure that material information relating to the Company is made known to the Company's principal executive officer and principal financial officer by others within those entities; and such disclosure controls and procedures are effective;

(x) The Company owns, or possesses valid and enforceable licenses to use all Intellectual Property that is used in or, to the Company's knowledge, is necessary for the conduct of the Company's business as now conducted or as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus as conducted or proposed to be conducted, except as such failure to own, possess, or acquire such rights would not or would not reasonably be expected to result in a Material Adverse Effect. Furthermore, (A) to the knowledge of the Company, there is no infringement, misappropriation or violation by third parties of any such Intellectual Property; (B) there is no pending or, to the knowledge of the Company, threatened, action, suit, proceeding or claim by others challenging the rights in or to any such Intellectual Property, and the Company is unaware of any facts which would form a reasonable basis for any such claim; (C) the Company Intellectual Property, and to the knowledge of the Company, the Intellectual Property licensed to the Company, has not been

8

adjudged invalid or unenforceable, in whole or in part, and there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the validity, inventorship, ownership or scope of any such Company Intellectual Property or licensed Intellectual Property, and the Company is unaware of any facts which would form a reasonable basis for any such action, suit, proceeding or claim; (D) there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others that the Company infringes, misappropriates or otherwise violates, or would, upon the commercialization of any product or service described in the Registration Statement, the Pricing Disclosure Prospectus and the Prospectus as under development, infringe, misappropriate or violate, any Intellectual Property or other proprietary rights of others, the Company has not received any written notice of any such claim, and except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, and the Company is unaware of any facts which would form a reasonable basis for any such action, suit, proceeding or claim; (E) to the Company's knowledge, no employee of the Company is in or has ever been in violation of any term of any employment contract, patent disclosure agreement, invention assignment agreement, non-competition agreement, non-solicitation agreement, nondisclosure agreement or any restrictive covenant to or with a former employer where the basis of such violation relates to such employee's employment with the Company or actions undertaken by the employee while employed with the Company, in each case, that would reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect; (F) the drug candidates referred to as IMO-8400, IMO-9200, IMO-2055, IDRA-008, 3GA Compound and IMO-2125, and described in the Registration Statement, the Pricing Disclosure Prospectus and the Prospectus as under development by the Company or its collaborators are covered by one or more claims of an issued U.S. patent solely owned by the Company and (G) the Company has taken commercially reasonable measures to protect its confidential information and trade secrets and to maintain and safeguard its Intellectual Property, including the execution of appropriate nondisclosure and confidentiality agreements, and the Company is unaware of any breach of such nondisclosure and confidentiality agreements or misappropriation of any such confidential information or trade secrets that would reasonably be expected, individually or in the aggregate, to have a Material Adverse Effect. "Intellectual Property" shall mean all patents, patent applications, trade and service marks, trade and service mark registrations, trade names, copyrights, licenses, inventions, trade secrets, domain names, technology, know-how and other intellectual property. "Company Intellectual Property" shall mean all Intellectual Property owned, in whole or in part, by Company. The Company has obtained assignments of Company Intellectual Property from all inventors to the Company of the Company Intellectual Property and such assignments have been duly recorded against the relevant Company Intellectual Property by filing of documents at the United States Patent and Trademark Office (the "PTO") and the Company Intellectual Property is not

9

subject to any liens. There are no outstanding options, licenses or agreements of any kind that have been entered into by the Company, and to the knowledge of the Company, by any third party, that relate to the Company Intellectual Property that are required by applicable law to be described in the Registration Statement, the Pricing Disclosure Package or the Prospectus that are not described therein in all material respects. To the knowledge of the Company, the Company has duly and properly filed or caused to be filed with the PTO and applicable foreign and international patent authorities all pending or issued patent applications owned by the Company (the "Patent Applications"). To the knowledge of the Company, the Company has complied with the PTO's duty of candor, good faith and disclosure and best mode requirement for the Patent Applications, and all other requirements for patentability and enforceability of any resultant patents, and have made no material misrepresentation in the Patent Applications with an intent to deceive the PTO. To the knowledge of the Company, the Company has complied with the relevant foreign filing requirements underlying patentability and enforceability of any resultant patents for the Patent Applications pending in countries outside of the United States. The Company is not aware of any information material to a determination of patentability regarding the Patent Applications not submitted to or possessed by the PTO or, if required, similar foreign authority by the Company with respect to the prosecution of any Patent Applications. The Company has no knowledge of any information which would preclude the Company from having clear title to any Patent Applications, or would preclude the patentability, validity or enforceability of any patents or patent applications included in the Company Intellectual Property;

(y) The Company has filed with the U.S. Food and Drug Administration (the “FDA”), and all applicable foreign, state, and local regulatory bodies, and received approval of, all registrations, applications, licenses, requests for exemptions, permits and other regulatory authorizations necessary to conduct the Company’s business as now conducted; the Company is in compliance in all material respects with all such registrations, applications, licenses, requests for exemptions, permits and other regulatory authorizations, and, to the Company’s knowledge, no event has occurred which allows, or after notice or lapse of time would allow, revocation or termination thereof or results in any other material impairment of the rights of the holder of any such registrations, applications, licenses, requests for exemptions, permits and other regulatory authorizations. All such registrations, applications, licenses, requests for exemptions, permits and other regulatory authorizations are in full force and effect;

(z) The Company is in compliance in all material respects with all applicable FDA, foreign, state, and local rules and regulations, including, but not limited to, applicable FDA, foreign, state, and local rules and regulations, relating to registration, investigational use, premarket clearance, licensure, application approval, good manufacturing practices, good laboratory practices, good clinical practices, product listing, quotas, labeling, advertising, record keeping, and filing

10

of reports, except where the failure to be in compliance would not have or reasonably be expected to result in a Material Adverse Effect. There is no pending, completed or, to the Company’s knowledge, threatened, action (including any lawsuit, arbitration, or legal or administrative or regulatory proceeding, charge, complaint, or investigation) against the Company by the FDA or any other governmental entity, and the Company has not received any FDA Form 483, notice of adverse finding, warning letter or untitled letter from the FDA or any other governmental entity, which (i) contests the premarket clearance, licensure, registration, or approval of, the uses of, the distribution of, the manufacturing or packaging of, the testing of, the sale of, or the labeling and promotion of any of the Company’s products, (ii) withdraws its approval of, requests the recall, suspension, or seizure of, or withdraws or orders the withdrawal of advertising or sales promotional materials relating to, any of the Company’s products, (iii) imposes a clinical hold on any clinical investigation by the Company, except as disclosed in the Pricing Disclosure Package and the Prospectus, (iv) enjoins production at any facility of the Company, (v) enters or proposes to enter into a consent decree of permanent injunction with the Company, or (vi) otherwise alleges any violation of any laws, rules or regulations by the Company, and which, either individually or in the aggregate, would have or reasonably be expected to result in a Material Adverse Effect;

(aa) (i) The preclinical tests and clinical trials that are described in, or the results of which are referred to in, the Pricing Disclosure Package and the Prospectus were and, if still pending, are being conducted in all material respects in accordance with the protocols established for each such preclinical test or clinical trial and all applicable laws, rules, and regulations of the FDA, including, without limitation, 21 C.F.R. parts 50, 54, 56, 58, and 312, and similar foreign, state, and local regulatory authorities; and (ii) the descriptions of the results of the preclinical tests and clinical trials contained in the Pricing Disclosure Package and the Prospectus are accurate and complete in all material respects and fairly present the data derived from such preclinical tests and clinical trials, and, to the knowledge of the Company, there are no other studies or tests, the results of which could reasonably be expected to discredit or call into question the results described in the Pricing Disclosure Package and the Prospectus;

(bb) Neither the Company nor, to the knowledge of the Company, any of its officers, directors or managing employees (as defined in 42 U.S.C. § 1320a-5(b)) is or has been excluded, suspended or debarred from participation in any state or federal health care program, or made subject to any pending or, to the Company’s knowledge, threatened or contemplated action which could reasonably be expected to result in such exclusion, suspension or debarment;

(cc) The statistical and market-related data included in the Registration Statement, the Preliminary Prospectus and the Pricing Prospectus, are based on or derived from sources that the Company believes to be reliable and accurate;

11

(dd) The Company’s board of directors meets the independence requirements of, and has established an audit committee that meets the independence requirements of, the rules and regulations of the Commission and The NASDAQ Stock Market LLC (the “NASDAQ”);

(ee) No material labor or employment dispute with the employees of the Company exists or, to the knowledge of the Company, is imminent; and the Company is not aware of any existing, threatened or imminent labor disturbance by the employees of any of its principal suppliers, manufacturers or contractors that, if it occurred, would have a Material Adverse Effect and no employees of the Company are subject to a collective bargaining agreement;

(ff) The Company maintains insurance against such losses and risks as is, in the Company’s reasonable judgment, prudent and customary in the businesses in which it is engaged; the Company has not been refused any insurance coverage sought or applied for; and the Company does not have any reason to believe that it will not be able to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage from similar insurers as may be reasonably necessary to continue its business at a cost that would not have a Material Adverse Effect;

(gg) Neither the Company nor, to the knowledge of the Company, any director, officer, agent, employee, affiliate or other person associated with or acting on behalf of the Company has (i) used any corporate funds for any unlawful contribution, gift, entertainment or other unlawful expense relating to political activity; (ii) made any direct or indirect unlawful payment to any foreign or domestic government official or employee from corporate funds; (iii) violated or is in violation of any provision of the Foreign Corrupt Practices Act of 1977 or any other applicable anti-bribery or anti-corruption laws; (iv) violated or is in violation of any provision of the Bribery Act 2010 of the United Kingdom to the extent applicable to the Company; or (v) made any bribe, rebate, payoff, influence payment, kickback or other unlawful payment. The Company has instituted, maintains and enforces, and will continue to maintain and enforce policies and procedures designed to promote and ensure compliance with all applicable anti-bribery and anti-corruption laws.

(hh) The operations of the Company 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 jurisdictions, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any governmental agency having jurisdiction over the Company (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 with respect to the Money Laundering Laws is pending or, to the knowledge of the Company, threatened.

12

(ii) Neither the Company, nor, to the knowledge of the Company, any director, officer, agent, employee or affiliate of the Company is currently the subject or the target of any sanctions administered or enforced by the U.S. Government, including, without limitation, the Office of Foreign Assets Control of the U.S. Department of the Treasury (“OFAC”), or other relevant sanctions authority (collectively, “Sanctions”), nor is the Company located, organized or resident in any country or territory that is the subject of Sanctions, and the Company will not directly or indirectly use the proceeds of the offering of the Shares hereunder, or lend, contribute or otherwise make available such proceeds to any joint venture partner or other person or entity (i) to fund any activities of or business with any person, or in any country or territory, that, at the time of such funding, is the subject of Sanctions or (ii) in any other manner that will result in a violation by any person (including any person participating in the transaction, whether as underwriter, advisor, investor or otherwise) of Sanctions.

(jj) There is and has been no failure on the part of the Company or any of the Company’s directors or officers, in their capacities as such, to comply with any provision of the Sarbanes-Oxley Act of 2002, as amended and the rules and regulations promulgated in connection therewith, including Section 402 related to loans and Sections 302 and 906 related to certifications.

(kk) The Company satisfies the eligibility requirements in existence immediately prior to October 21, 1992 for the use of a registration statement on Form S-3 for the offering of the Shares.

2. Subject to the terms and conditions herein set forth, (a) the Company agrees to issue and sell to each of the Underwriters, and each of the Underwriters agrees, severally and not jointly, to purchase from the Company, at a purchase price per share of \$1.41, the number of Firm Shares set forth opposite the name of such Underwriter in Schedule I hereto and (b) in the event and to the extent that the Underwriters shall exercise the election to purchase Optional Shares as provided below, the Company agrees to issue and sell to each of the Underwriters, and each of the Underwriters agrees, severally and not jointly, to purchase from the Company, at the purchase price per share set forth in clause (a) of this Section 2, that portion of the number of Optional Shares as to which such election shall have been exercised (to be adjusted by you so as to eliminate fractional shares) determined by multiplying such number of Optional Shares by a fraction, the numerator of which is the maximum number of Optional Shares which such Underwriter is entitled to purchase as set forth opposite the name of such Underwriter in Schedule I hereto and the denominator of which is the maximum number of Optional Shares that all of the Underwriters are entitled to purchase hereunder.

The Company hereby grants to the Underwriters the right to purchase at their election up to 5,000,000 Optional Shares, at the purchase price per share set forth in clause (a) of the first paragraph of this Section 2, provided that the

13

purchase price per Optional Share shall be reduced by an amount per share equal to any dividends or distributions declared by the Company and payable on the Firm Shares but not payable on the Optional Shares. Any such election to purchase Optional Shares may be exercised only by written notice from you to the Company, given within a period of 30 calendar days after the date of this Agreement, setting forth the aggregate number of Optional Shares to be purchased and the date on which such Optional Shares are to be delivered, as determined by you but in no event earlier than the First Time of Delivery or, unless you and the Company otherwise agree in writing, earlier than two or later than ten business days after the date of such notice. No Optional Shares shall be sold or delivered unless the Firm Shares previously have been, or simultaneously are, sold and delivered. The right to purchase the Optional Shares or any portion thereof may be exercised from time to time and to the extent not previously exercised may be surrendered and terminated at any time upon notice by the Representatives to the Company.

3. The several Underwriters propose to offer the Firm Shares for sale upon the terms and conditions set forth in the Pricing Disclosure Package and the Prospectus.

4. (a) The Shares to be purchased by each Underwriter hereunder, in definitive form, and in such authorized denominations and registered in such names as the Representatives may request upon at least forty-eight hours’ prior notice to the Company shall be delivered by or on behalf of the Company to the Representatives, through the facilities of the Depository Trust Company (“DTC”), for the account of such Underwriter, against payment by or on behalf of such Underwriter of the purchase price therefor by wire transfer of Federal (same-day) funds to the account specified by the Company to the Representatives at least forty-eight hours in advance. The time and date of such delivery and payment shall be, with respect to the Firm Shares, 9:30 a.m., New York City time, on October 30, 2017 or such other time and date as the Representatives and the Company may agree upon in writing, and, with respect to the Optional Shares, 9:30 a.m., New York time, on the date specified by the Representatives in the written notice given by the Representatives of the Underwriters’ election to purchase such Optional Shares, or such other time and date as the Representatives and the Company may agree upon in writing. Such time and date for delivery of the Firm Shares is herein called the “First Time of Delivery”, such time and date for delivery of the Optional Shares, if not the First Time of Delivery, is herein called the “Second Time of Delivery”, and each such time and date for delivery is herein called a “Time of Delivery.”

(b) The documents to be delivered at each Time of Delivery by or on behalf of the parties hereto pursuant to Section 8 hereof, including the cross receipt for the Shares and any additional documents requested by the Underwriters pursuant to Section 8(l) hereof, will be delivered at the offices of Ropes & Gray LLP 800 Boylston Street Boston, MA 02199 (the “Closing

14

Location”), and the Shares will be delivered at the facilities of DTC, all at such Time of Delivery. A meeting will be held at the Closing Location at 4:00 p.m., New York City time, on the New York Business Day next preceding such Time of Delivery, at which meeting the final drafts of the documents to be delivered pursuant to the preceding sentence will be available for review by the parties hereto. For the purposes of this Section 4, “New York Business Day” shall mean each Monday, Tuesday, Wednesday, Thursday and Friday which is not a day on which banking institutions in New York City are generally authorized or obligated by law or executive order to close.

5. The Company agrees with each of the Underwriters:

(a) To prepare the Prospectus in a form approved by you and to file such Prospectus pursuant to Rule 424(b) under the Act not later than the Commission's close of business on the second business day following the execution and delivery of this Agreement, or, if applicable, such earlier time as may be required by Rule 430A(a)(3) under the Act; to make no further amendment or any supplement to the Registration Statement or the Prospectus prior to the last Time of Delivery which shall be disapproved by you promptly after reasonable notice thereof; to advise you, promptly after it receives notice thereof, of the time when any amendment to the Registration Statement has been filed or becomes effective or any amendment or supplement to the Prospectus has been filed and to furnish you with copies thereof; to file promptly all material required to be filed by the Company with the Commission pursuant to Rule 433(d) under the Act, within the time required by such rule; to file promptly all reports and any definitive proxy or information statements required to be filed by the Company with the Commission pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act subsequent to the date of the Prospectus and for so long as the delivery of a prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) is required in connection with the offering or sale of the Shares; to advise you, promptly after it receives notice thereof, of the issuance by the Commission of any stop order or of any order preventing or suspending the use of any Preliminary Prospectus or other prospectus in respect of the Shares, of the suspension of the qualification of the Shares for offering or sale in any jurisdiction, of the initiation or threatening of any proceeding for any such purpose or pursuant to Section 8A of the Act, or of any request by the Commission for the amending or supplementing of the Registration Statement or the Prospectus or for additional information; and, in the event of the issuance of any stop order or of any order preventing or suspending the use of any Preliminary Prospectus or other prospectus or suspending any such qualification, to promptly use its best efforts to obtain the withdrawal of such order;

(b) Promptly from time to time to take such action as you may reasonably request to qualify the Shares for offering and sale under the securities laws of such jurisdictions as you may request and to comply with such laws so as

15

to permit the continuance of sales and dealings therein in such jurisdictions for as long as may be necessary to complete the distribution of the Shares, provided that in connection therewith the Company shall not be required to qualify as a foreign corporation or to file a general consent to service of process in any jurisdiction or subject itself to taxation in any jurisdiction in which it was not otherwise subject to taxation;

(c) Prior to 10:00 a.m., New York City time, on the New York Business Day next succeeding the date of this Agreement (or such later time as may be agreed to by the Company and you on behalf of the Underwriters) and from time to time, to furnish the Underwriters with written and electronic copies of the Prospectus in New York City in such quantities as you may reasonably request, and, if the delivery of a prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) is required at any time prior to the expiration of nine months after the time of issue of the Prospectus in connection with the offering or sale of the Shares and if at such time any event shall have occurred as a result of which the Prospectus as then amended or supplemented would include an untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made when such Prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) is delivered, not misleading, and if at any time prior to the Time of Delivery (i) any event or development shall occur or condition shall exist as a result of which the Pricing Disclosure Package as then amended or supplemented would include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances existing when the Pricing Disclosure Package is delivered to a purchaser, not misleading or (ii) it is necessary to amend or supplement the Prospectus or the Pricing Disclosure Package to comply with law, the Company will notify the Underwriters thereof and forthwith prepare and file with the Commission (to the extent required) and furnish to the Underwriters and to such dealers as the Representative may designate such amendments or supplements to the Pricing Disclosure Package (or any document to be filed with the Commission and incorporated by reference therein) as may be necessary so that the statements in the Pricing Disclosure Package as so amended or supplemented will not, in the light of the circumstances existing when the Pricing Disclosure Package is delivered to a purchaser, be misleading or so that the Pricing Disclosure Package will comply with law or, if for any other reason it shall be necessary during such same period to amend or supplement the Prospectus or to file under the Exchange Act any document incorporated by reference in the Prospectus in order to comply with the Act or the Exchange Act, to notify you and upon your request to file such document and to prepare and furnish without charge to each Underwriter and to any dealer in securities as many written and electronic copies as you may from time to time reasonably request of an amended Prospectus or a supplement to the Prospectus which will correct such statement

16

or omission or effect such compliance; and in case any Underwriter is required to deliver a prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) in connection with sales of any of the Shares at any time nine months or more after the time of issue of the Prospectus, upon your request but at the expense of such Underwriter, to prepare and deliver to such Underwriter as many written and electronic copies as you may reasonably request of an amended or supplemented Prospectus complying with Section 10(a)(3) of the Act;

(d) To make generally available to its securityholders as soon as practicable, but in any event not later than twelve months after the effective date of the Registration Statement (as defined in Rule 158(c) under the Act), an earnings statement of the Company (which need not be audited) complying with Section 11(a) of the Act and the rules and regulations of the Commission thereunder (including, at the option of the Company, Rule 158);

(e)(1) During the period beginning from the date hereof and continuing to and including the date 90 days after the date of the Prospectus (the "Lock-Up Period"), without the prior written consent of J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC, not to (i) offer, sell, contract to sell, pledge, grant any option to purchase, make any short sale or otherwise transfer or dispose of, directly or indirectly, or file with the Commission a registration statement under the Act relating to, any securities of the Company that are substantially similar to the Shares, including but not limited to any options or warrants to purchase shares of Stock or any securities that are convertible into or exchangeable for, or that represent the right to receive, Stock or any such substantially similar securities, or publicly disclose the intention to make any offer, sale, pledge, disposition or filing or publicly announce the intention to do any of the foregoing, except as contemplated by that certain Registration Rights Agreement, dated as of February 9, 2015, by and among the Company, 667, L.P., Baker Brothers Life Sciences, L.P. and 14159, L.P. or (ii) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of the Stock or any such other securities, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Stock or such other securities, in cash or otherwise (other than (A) the Shares to be sold hereunder, (B) to directors, officers, employees and consultants of the Company pursuant to employee benefit plans, equity incentive plans or other employee compensation plans disclosed in the Registration Statement and existing on the date of this Agreement, (C) upon the conversion or exchange of convertible or exchangeable securities outstanding as of the date of this Agreement, (D) the filing by the Company of any registration statement on Form S-8 or a successor form thereto, or (E) securities of the Company issued in connection with a joint venture or collaboration or other strategic or commercial relationship existing prior to, on or following the date of this

aggregate number of shares of Stock that the Company may issue or agree to issue pursuant to clause (E) shall not equal or exceed five percent (5%) of the total number of shares of the Company's Stock issued and outstanding immediately following the completion of the transactions contemplated by this Agreement;

(f) To furnish to its stockholders as soon as practicable after the end of each fiscal year an annual report (including a balance sheet and statements of income, stockholders' equity and cash flows of the Company certified by independent public accountants) and, as soon as practicable after the end of each of the first three quarters of each fiscal year (beginning with the fiscal quarter ending after the effective date of the Registration Statement), to make available to its stockholders summary financial information of the Company for such quarter in reasonable detail;

(g) During a period of five years from the effective date of the Registration Statement, to furnish to you copies of all reports or other communications (financial or other) furnished to stockholders, and to deliver to you (i) as soon as they are available, copies of any reports and financial statements furnished to or filed with the Commission or any national securities exchange on which any class of securities of the Company is listed; and (ii) such additional information concerning the business and financial condition of the Company as you may from time to time reasonably request;

(h) To use the net proceeds received by it from the sale of the Shares pursuant to this Agreement in the manner specified in the Pricing Prospectus under the caption "Use of Proceeds"; and

(i) To use its best efforts to list for quotation the Shares on the NASDAQ;

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

(k) Upon request of any Underwriter, to furnish, or cause to be furnished, to such Underwriter an electronic version of the Company's trademarks, servicemarks and corporate logo for use on the website, if any, operated by such Underwriter for the purpose of facilitating the on-line offering of the Shares (the "License"); provided, however, that the License shall be used solely for the purpose described above, is granted without any fee and may not be assigned or transferred.

6. (a) The Company represents and agrees that, without the prior consent of the Representatives, it has not made and will not make any offer

relating to the Shares that would constitute a "free writing prospectus" as defined in Rule 405 under the Act, other than any such free writing prospectus the use of which has been consented to by the Representatives and which is listed on Schedule II(b) hereto; each Underwriter severally represents and agrees that, without the prior consent of the Company and the Representatives, it has not made and will not make any offer relating to the Shares that would constitute a free writing prospectus that would be required to be filed with the Commission; any such free writing prospectus the use of which has been consented to by the Company and the Representatives is listed on Schedule II(b) hereto;

(b) The Company has complied and will comply with the requirements of Rule 433 under the Act applicable to any Issuer Free Writing Prospectus, including timely filing with the Commission or retention where required and legending; and

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

7. The Company covenants and agrees with the several Underwriters that the Company will pay or cause to be paid the following: (i) the fees, disbursements and expenses of the Company's counsel and accountants in connection with the registration of the Shares under the Act and all other expenses in connection with the preparation, printing, reproduction and filing of the Registration Statement, any Preliminary Prospectus, any Issuer Free Writing Prospectus and the Prospectus and amendments and supplements thereto and the mailing and delivering of copies thereof to the Underwriters and dealers; (ii) the cost of printing or producing any Agreement among Underwriters, this Agreement, the Blue Sky Memorandum, closing documents (including any compilations thereof) and any other documents in connection with the offering, purchase, sale and delivery of the Shares; (iii) all expenses in connection with the qualification of the Shares for offering and sale under state securities laws as provided in Section 5(b) hereof, including the reasonable fees and disbursements

of counsel for the Underwriters in connection with such qualification and in connection with the Blue Sky survey (iv) all fees and expenses in connection with listing the Shares on NASDAQ; (v) the filing fees incident to, and the fees and disbursements of counsel for the Underwriters in connection with, any required review and approval by FINRA of the terms of the sale of the Shares; (vi) the costs incidental to the issuance of the Shares, including the costs of preparation of certificates representing the Shares; (vii) the cost and charges of any transfer agent or registrar; (viii) the costs incurred by the Company and its employees associated with any "road show" undertaken in connection with the marketing of the offering of the Shares; and (ix) all other costs and expenses incident to the performance of its obligations hereunder which are not otherwise specifically provided for in this Section. It is understood, however, that, except as provided in this Section, and Sections 9 and 12 hereof, the Underwriters will pay all of their own costs and expenses, including the fees of their counsel, stock transfer taxes on resale of any of the Shares by them, and any advertising expenses connected with any offers they may make.

8. The obligations of the Underwriters hereunder, as to the Shares to be delivered at each Time of Delivery, shall be subject, in their discretion, to the condition that all representations and warranties and other statements of the Company herein are, as of the date hereof and at and as of such Time of Delivery, true and correct, the condition that the Company shall have performed all of its obligations hereunder theretofore to be performed, and the following additional conditions:

(a) The Prospectus shall have been filed with the Commission pursuant to Rule 424(b) under the Act within the applicable time period prescribed for such filing by the rules and regulations under the Act and in accordance with Section 5(a) hereof; all material required to be filed by the Company pursuant to Rule 433(d) under the Act shall have been filed with the Commission within the applicable time period prescribed for such filing by Rule 433; if the Company has elected to rely upon Rule 462(b) under the Act, the Rule 462(b) Registration Statement shall have become effective by 10:00 P.M., Washington, D.C. time, on the date of this Agreement; no stop order suspending the effectiveness of the Registration Statement or any part thereof shall have been issued and no proceeding for that purpose or pursuant to Section 8A of the Act shall have been initiated or, to the knowledge of the Company, threatened by the Commission; no stop order suspending or preventing the use of the Prospectus or any Issuer Free Writing Prospectus shall have been initiated or threatened by the Commission; and all requests for additional information on the part of the Commission shall have been complied with to your reasonable satisfaction;

20

(b) Ropes & Gray LLP, counsel for the Underwriters, shall have furnished to you an opinion and negative assurance letter, dated such Time of Delivery, in form and substance satisfactory to you, with respect to such matters as you may reasonably request, and such counsel shall have received such papers and information as they may reasonably request to enable them to pass upon such matters;

(c) Wilmer Cutler Pickering Hale and Dorr LLP, corporate counsel for the Company, shall have furnished to you an opinion and negative assurance letter, dated such Time of Delivery, in form and substance satisfactory to you;

(d) Morgan, Lewis & Bockius LLP, the Company's intellectual property counsel, shall have furnished to you an opinion and negative assurance letter, dated such Time of Delivery, in form and substance satisfactory to you;

(e) On the date of the Prospectus, on the effective date of any post-effective amendment to the Registration Statement filed subsequent to the date of this Agreement and also at each Time of Delivery, Ernst & Young LLP shall furnish to you a letter or letters, dated the respective dates of delivery thereof, in form and substance satisfactory to you;

(f) (i) Since the date of the latest audited financial statements included or incorporated by reference in the Pricing Prospectus, the Company shall not have sustained any loss or interference with its business from fire, explosion, flood or other calamity, whether or not covered by insurance, or from any labor dispute or court or governmental action, order or decree, otherwise than as set forth or contemplated in the Pricing Prospectus, and (ii) since the respective dates as of which information is given in the Pricing Prospectus there shall not have been any change in the capital stock (other than pursuant to the conversion, exchange or exercise of convertible, exchangeable or exercisable securities, including without limitation options and warrants, and grant of equity incentives, in each case in the ordinary course of business) or any increase in long-term debt of the Company or any change, or any development involving a prospective change, in or affecting the general affairs, management, financial position, stockholders' equity or results of operations of the Company, otherwise than as set forth or contemplated in the Pricing Prospectus, the effect of which, in any such case described in clause (i) or (ii), is in your judgment so material and adverse as to make it impracticable or inadvisable to proceed with the public offering or the delivery of the Shares being delivered at such Time of Delivery on the terms and in the manner contemplated in this Agreement and in the Pricing Disclosure Package and the Prospectus;

21

(g) On or after the Applicable Time (i) no downgrading shall have occurred in the rating accorded the Company's debt securities or preferred stock by any "nationally recognized statistical rating organization", as that term is defined by the Commission for purposes in Section 3(a)(62) of the Exchange Act, and (ii) no such organization shall have publicly announced that it has under surveillance or review, with possible negative implications, its rating of any of the Company's debt securities or preferred stock;

(h) On or after the Applicable Time there shall not have occurred any of the following: (i) a suspension or material limitation in trading in securities generally on the New York Stock Exchange or on NASDAQ; (ii) a suspension or material limitation in trading in the Company's securities on NASDAQ; (iii) a general moratorium on commercial banking activities declared by either Federal or New York State authorities or a material disruption in commercial banking or securities settlement or clearance services in the United States; (iv) the outbreak or escalation of hostilities involving the United States or the declaration by the United States of a national emergency or war or (v) the occurrence of any other calamity or crisis or any change in financial, political or economic conditions in the United States or elsewhere, if the effect of any such event specified in clause (iv) or (v) in your judgment makes it impracticable or inadvisable to proceed with the public offering or the delivery of the Shares being delivered at such Time of Delivery on the terms and in the manner contemplated in the Pricing Disclosure Package and the Prospectus;

(i) The Shares to be sold at such Time of Delivery shall have been duly listed, subject to official notice of issuance, on NASDAQ; and

(j) The Company shall have obtained and delivered to the Underwriters executed copies of an agreement from each director and officer of the Company and each stockholder listed on Schedule A hereto, substantially in the form of Schedule B hereto;

(k) The Company shall have complied with the provisions of Section 5(c) hereof with respect to the furnishing of prospectuses on the New York Business Day next succeeding the date of this Agreement; and

(l) The Company shall have furnished or caused to be furnished to you at such Time of Delivery certificates of officers of the Company satisfactory to you as to the accuracy of the representations and warranties of the Company herein at and as of such Time of Delivery, as to the performance by the Company of all of its obligations hereunder to be performed at or prior to such Time of Delivery, as to the matters set forth in subsections (a) and (e) of this Section and as to such other matters as you may reasonably request.

22

9. (a) The Company will indemnify and hold harmless each Underwriter against any losses, claims, damages or liabilities, joint or several, to which such Underwriter may become subject, under the Act or otherwise, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon (i) any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement or caused by any omission or alleged omission to state therein a material fact required to be stated therein or necessary in order to make the statements therein, not misleading, or (ii) any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, any Preliminary Prospectus, any Pricing Disclosure Package (including any Pricing Disclosure Package that has subsequently been amended) or the Prospectus, or any amendment or supplement thereto, any Issuer Free Writing Prospectus or any "issuer information" filed or required to be filed pursuant to Rule 433(d) under the Act, or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading, and will reimburse each Underwriter for any legal or other expenses reasonably incurred by such Underwriter in connection with investigating or defending any such action or claim as such expenses are incurred; provided, however, that the Company shall not be liable in any such case to the extent that any such loss, claim, damage or liability arises out of or is based upon an untrue statement or alleged untrue statement or omission or alleged omission made in the Registration Statement, any Preliminary Prospectus, the Pricing Prospectus or the Prospectus, or any amendment or supplement thereto, or any Issuer Free Writing Prospectus, in reliance upon and in conformity with written information furnished to the Company by any Underwriter through the Representatives expressly for use therein.

(b) Each Underwriter will, severally and not jointly, indemnify and hold harmless the Company against any losses, claims, damages or liabilities to which the Company may become subject, under the Act or otherwise, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon an untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, any Preliminary Prospectus, any Pricing Disclosure Package (including any Pricing Disclosure Package that has subsequently been amended) or the Prospectus, or any amendment or supplement thereto, or any Issuer Free Writing Prospectus, or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, 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, any Preliminary Prospectus, the Pricing Prospectus or the Prospectus, or any amendment or supplement thereto, or any Issuer Free Writing Prospectus, in reliance upon and in conformity with written information

23

furnished to the Company by such Underwriter through the Representatives expressly for use therein; and will reimburse the Company for any legal or other expenses reasonably incurred by the Company in connection with investigating or defending any such action or claim as such expenses are incurred. For avoidance of doubt, the Company and each of the Underwriters acknowledge and agree that the only written information furnished to the Company by the Underwriters through the Underwriters are as follows: (i) the discount figure in the third paragraph of text under the caption "Underwriting" in the Registration Statement; (ii) the third and fourth sentences of the third paragraph of text under the caption "Underwriting" in the Registration Statement concerning the reoffering terms; (iii) the ninth paragraph of text under the caption "Underwriting" in the Registration Statement concerning short sales, stabilization and purchases to cover short sales by the Underwriters; and (iv) the tenth paragraph of text under the caption "Underwriting" in the Registration Statement concerning penalty bids imposed by the Underwriters.

(c) Promptly after receipt by an indemnified party under subsection (a) or (b) above of notice of the commencement of any action, such indemnified party shall, if a claim in respect thereof is to be made against the indemnifying party under such subsection, notify the indemnifying party in writing of the commencement thereof; but the omission so to notify the indemnifying party shall not relieve it from any liability which it may have to any indemnified party otherwise than under such subsection. In case any such action shall be brought against any indemnified party and it shall notify the indemnifying party of the commencement thereof, the indemnifying party shall be entitled to participate therein and, to the extent that it shall wish, jointly with any other indemnifying party similarly notified, to assume the defense thereof, with counsel satisfactory to such indemnified party (who shall not, except with the consent of the indemnified party, be counsel to the indemnifying party), and, after notice from the indemnifying party to such indemnified party of its election so to assume the defense thereof, the indemnifying party shall not be liable to such indemnified party under such subsection for any legal expenses of other counsel (other than any local counsel) or any other expenses, in each case subsequently incurred by such indemnified party, in connection with the defense thereof other than reasonable costs of investigation. In any such proceeding, any indemnified party shall have the right to retain its own counsel, but the fees and expenses of such counsel shall be at the expense of such indemnified party unless (i) the indemnifying party and the indemnified party shall have mutually agreed to the contrary; (ii) the indemnifying party has failed within a reasonable time to retain counsel reasonably satisfactory to the indemnified party; (iii) the indemnified party shall have reasonably concluded that there may be legal defenses available to it that are different from or in addition to those available to the indemnifying party; or (iv) the named parties in any such proceeding (including any impleaded parties) include both the indemnifying party and the indemnified party and representation

24

of both parties by the same counsel would be inappropriate due to actual or potential differing interest between them. No indemnifying party shall, without the written consent of the indemnified party, effect the settlement or compromise of, or consent to the entry of any judgment with respect to, any pending or threatened action or claim in respect of which indemnification or contribution may be sought hereunder (whether or not the indemnified party is an actual or potential party to such action or claim) unless such settlement, compromise or judgment (i) includes an unconditional release of the indemnified party from all

liability arising out of such action or claim and (ii) does not include a statement as to or an admission of fault, culpability or a failure to act, by or on behalf of any indemnified party.

(d) If the indemnification provided for in this Section 9 is unavailable to or insufficient to hold harmless an indemnified party under subsection (a) or (b) above in respect of any losses, claims, damages or liabilities (or actions in respect thereof) referred to therein, then each indemnifying party shall contribute to the amount paid or payable by such indemnified party as a result of such losses, claims, damages or liabilities (or actions in respect thereof) in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and the Underwriters on the other from the offering of the Shares. If, however, the allocation provided by the immediately preceding sentence is not permitted by applicable law or if the indemnified party failed to give the notice required under subsection (c) above, then each indemnifying party shall contribute to such amount paid or payable by such indemnified party in such proportion as is appropriate to reflect not only such relative benefits but also the relative fault of the Company on the one hand and the Underwriters on the other in connection with the statements or omissions which resulted in such losses, claims, damages or liabilities (or actions in respect thereof), as well as any other relevant equitable considerations. The relative benefits received by the Company on the one hand and the Underwriters on the other shall be deemed to be in the same proportion as the total net proceeds from the offering (net of underwriting discounts and commissions but before deducting any other expenses) received by the Company bear to the total underwriting discounts and commissions received by the Underwriters, in each case as set forth in the table on the cover page of the Prospectus. The relative fault shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the Company on the one hand or the Underwriters on the other and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission. The Company and the Underwriters agree that it would not be just and equitable if contribution pursuant to this subsection (d) were determined by *pro rata* allocation (even if the Underwriters were treated as one entity for such purpose) or by any other method of allocation which does not take account of the equitable considerations referred to above in this subsection (d). The amount paid or payable by an indemnified

25

party as a result of the losses, claims, damages or liabilities (or actions in respect thereof) referred to above in this subsection (d) shall be deemed to include any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any such action or claim. Notwithstanding the provisions of this subsection (d), no Underwriter shall be required to contribute any amount in excess of the amount by which the total price at which the Shares underwritten by it and distributed to the public were offered to the public exceeds the amount of any damages which such Underwriter has otherwise been required to pay by reason of such untrue or alleged untrue statement or omission or alleged omission. No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. The Underwriters' obligations in this subsection (d) to contribute are several in proportion to their respective underwriting obligations and not joint.

(e) The obligations of the Company under this Section 9 shall be in addition to any liability which the Company may otherwise have and shall extend, upon the same terms and conditions, to each officer and director of each Underwriter and each person, if any, who controls any Underwriter within the meaning of the Act and each broker-dealer affiliate of any Underwriter; and the obligations of the Underwriters under this Section 9 shall be in addition to any liability which the respective Underwriters may otherwise have and shall extend, upon the same terms and conditions, to each officer and director of the Company and to each person, if any, who controls the Company within the meaning of the Act.

10. (a) If any Underwriter shall default in its obligation to purchase the Shares which it has agreed to purchase hereunder at a Time of Delivery, you may in your discretion arrange for you or another party or other parties to purchase such Shares on the terms contained herein. If within thirty-six hours after such default by any Underwriter you do not arrange for the purchase of such Shares, then the Company shall be entitled to a further period of thirty-six hours within which to procure another party or other parties satisfactory to you to purchase such Shares on such terms. In the event that, within the respective prescribed periods, you notify the Company that you have so arranged for the purchase of such Shares, or the Company notifies you that it has so arranged for the purchase of such Shares, you or the Company shall have the right to postpone such Time of Delivery for a period of not more than seven days, in order to effect whatever changes may thereby be made necessary in the Registration Statement or the Prospectus, or in any other documents or arrangements, and the Company agrees to file promptly any amendments or supplements to the Registration Statement or the Prospectus which in your opinion may thereby be made necessary. The term "Underwriter" as used in this Agreement shall include any

26

person substituted under this Section with like effect as if such person had originally been a party to this Agreement with respect to such Shares.

(b) If, after giving effect to any arrangements for the purchase of the Shares of a defaulting Underwriter or Underwriters by you and the Company as provided in subsection (a) above, the aggregate number of such Shares which remains unpurchased does not exceed one-eleventh of the aggregate number of all the Shares to be purchased at such Time of Delivery, then the Company shall have the right to require each non-defaulting Underwriter to purchase the number of shares which such Underwriter agreed to purchase hereunder at such Time of Delivery and, in addition, to require each non-defaulting Underwriter to purchase its pro rata share (based on the number of Shares which such Underwriter agreed to purchase hereunder) of the Shares of such defaulting Underwriter or Underwriters for which such arrangements have not been made; but nothing herein shall relieve a defaulting Underwriter from liability for its default.

(c) If, after giving effect to any arrangements for the purchase of the Shares of a defaulting Underwriter or Underwriters by you and the Company as provided in subsection (a) above, the aggregate number of such Shares which remains unpurchased exceeds one-eleventh of the aggregate number of all the Shares to be purchased at such Time of Delivery, or if the Company shall not exercise the right described in subsection (b) above to require non-defaulting Underwriters to purchase Shares of a defaulting Underwriter or Underwriters, then this Agreement (or, with respect to the Second Time of Delivery, the obligations of the Underwriters to purchase and of the Company to sell the Optional Shares) shall thereupon terminate, without liability on the part of any non-defaulting Underwriter or the Company, except for the expenses to be borne by the Company and the Underwriters as provided in Section 7 hereof and the indemnity and contribution agreements in Section 9 hereof (provided that if such default occurs with respect to Optional Shares after the First Time of Delivery, this Agreement will not terminate as to the Firm Shares or any Optional Shares purchased prior to such termination); but nothing herein shall relieve a defaulting Underwriter from liability for its default.

11. The respective indemnities, agreements, representations, warranties and other statements of the Company and the several Underwriters, as set forth in this Agreement or made by or on behalf of them, respectively, pursuant to this Agreement, shall remain in full force and effect, regardless of any

investigation (or any statement as to the results thereof) made by or on behalf of any Underwriter, any officer, director, broker-dealer affiliate of any Underwriter or any controlling person of any Underwriter, or the Company, or any officer or director or controlling person of the Company, and shall survive delivery of and payment for the Shares.

12. If this Agreement shall be terminated pursuant to Section 10 hereof, the Company shall not then be under any liability to any Underwriter except as provided in Sections 7 and 9 hereof; but, if for any other reason, any Shares are

27

not delivered by or on behalf of the Company as provided herein, the Company will reimburse the Underwriters through you for all out-of-pocket expenses approved in writing by you, including fees and disbursements of counsel, reasonably incurred by the Underwriters in making preparations for the purchase, sale and delivery of the Shares not so delivered, but the Company shall then be under no further liability to any Underwriter except as provided in Sections 7 and 9 hereof.

13. In all dealings hereunder, you shall act on behalf of each of the Underwriters, and the parties hereto shall be entitled to act and rely upon any statement, request, notice or agreement on behalf of any Underwriter made or given by the Representatives.

In accordance with the requirements of the USA Patriot Act (Title III of Pub. L. 107-56 (signed into law October 26, 2001)), the underwriters are required to obtain, verify and record information that identifies their respective clients, including the Company, which information may include the name and address of their respective clients, as well as other information that will allow the underwriters to properly identify their respective clients. All statements, requests, notices and agreements hereunder shall be in writing, and if to the Underwriters shall be delivered or sent by mail, telex or facsimile transmission to you as the Representatives in care of J.P. Morgan Securities LLC, 383 Madison Avenue, New York, New York 10179, Attention: Equity Syndicate Desk; Goldman Sachs & Co. LLC, 200 West Street, New York, New York 10282-2198, Attention: Registration Department; and Barclays Capital Inc., 745 Seventh Avenue, New York, New York 10019, Attention: Syndicate Registration (Fax: (646) 834-8133); with a copy to Ropes & Gray LLP 800 Boylston Street Boston, MA 02199, Attention: Patrick O'Brien, Esq. and if to the Company shall be delivered or sent by mail, telex or facsimile transmission to the address of the Company set forth in the Registration Statement, Attention: Secretary; with a copy to Wilmer Cutler Pickering Hale and Dorr LLP, 60 State Street, Boston, MA 02019, Attention: Stuart M. Falber; provided, however, that any notice to an Underwriter pursuant to Section 9(c) hereof shall be delivered or sent by mail, telex or facsimile transmission to such Underwriter at its address set forth in its Underwriters' Questionnaire, or telex constituting such Questionnaire, which address will be supplied to the Company by you upon request. Any such statements, requests, notices or agreements shall take effect upon receipt thereof.

14. This Agreement shall be binding upon, and inure solely to the benefit of, the Underwriters, the Company and, to the extent provided in Sections 9 and 11 hereof, the officers and directors of the Company and each person who controls the Company or any Underwriter (or any officer, director, broker-dealer affiliate of any Underwriter), and their respective heirs, executors, administrators, successors and assigns, and no other person shall acquire or have any right

28

under or by virtue of this Agreement. No purchaser of any of the Shares from any Underwriter shall be deemed a successor or assign by reason merely of such purchase.

15. Time shall be of the essence of this Agreement. As used herein, the term "business day" shall mean any day when the Commission's office in Washington, D.C. is open for business.

16. The Company acknowledges and agrees that (i) the purchase and sale of the Shares pursuant to this Agreement is an arm's-length commercial transaction between the Company, on the one hand, and the several Underwriters, on the other, (ii) in connection therewith and with the process leading to such transaction each Underwriter is acting solely as a principal and not the agent or fiduciary of the Company, (iii) no Underwriter has assumed an advisory or fiduciary responsibility in favor of the Company with respect to the offering contemplated hereby or the process leading thereto (irrespective of whether such Underwriter has advised or is currently advising the Company on other matters) or any other obligation to the Company except the obligations expressly set forth in this Agreement and (iv) the Company has consulted its own legal and financial advisors to the extent it deemed appropriate. The Company agrees that it will not claim that the Underwriters, or any of them, has rendered advisory services of any nature or respect, or owes a fiduciary or similar duty to the Company, in connection with such transaction or the process leading thereto.

17. This Agreement supersedes all prior agreements and understandings (whether written or oral) between the Company and the Underwriters, or any of them, with respect to the subject matter hereof.

18. **THIS AGREEMENT AND ANY MATTERS RELATED TO THIS TRANSACTION SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK WITHOUT REGARD TO PRINCIPLES OF CONFLICT OF LAWS THAT WOULD RESULT IN THE APPLICATION OF ANY LAW OTHER THAN THE LAWS OF THE STATE OF NEW YORK. The Company agrees that any suit or proceeding arising in respect of this agreement or our engagement will be tried exclusively in the U.S. District Court for the Southern District of New York or, if that court does not have subject matter jurisdiction, in any state court located in The City and County of New York and the Company agrees to submit to the jurisdiction of, and to venue in, such courts.**

19. **THE COMPANY AND EACH OF THE UNDERWRITERS HEREBY IRREVOCABLY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATING TO THIS AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY.**

29

20. This Agreement may be executed by any one or more of the parties hereto in any number of counterparts, each of which shall be deemed to be an original, but all such counterparts shall together constitute one and the same instrument.

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

If the foregoing is in accordance with your understanding, please sign and return to us five counterparts hereof, and upon the acceptance hereof by you, on behalf of each of the Underwriters, this letter and such acceptance hereof shall constitute a binding agreement between each of the Underwriters and the Company. It is understood that your acceptance of this letter on behalf of each of the Underwriters is pursuant to the authority set forth in a form of Agreement among Underwriters, the form of which shall be submitted to the Company for examination upon request, but without warranty on your part as to the authority of the signers thereof.

[Signature Page Follows]

30

Very truly yours,

Idera Pharmaceuticals, Inc.

By: /s/ Louis Arcudi III
Name: Louis Arcudi III
Title: Senior Vice President of Operations, Chief Financial Officer and Treasurer

Accepted as of the date hereof:

J.P. MORGAN SECURITIES LLC

By: /s/ David Ke
Name: David Ke
Title: Vice President

GOLDMAN SACHS & CO. LLC

By: /s/ Raffael Fiumara
Name: Raffael Fiumara
Title: Vice President

BARCLAYS CAPITAL INC.

By: /s/ Victoria Hale
Name: Victoria Hale
Title: Vice President

On behalf of each of the Underwriters

SCHEDULE I

Underwriter	Total Number of Firm Shares to be Purchased	Number of Optional Shares to be Purchased if Maximum Option Exercised
J.P. Morgan Securities LLC	12,833,334	1,925,000
Goldman Sachs & Co. LLC	12,833,334	1,925,000
Barclays Capital Inc.	6,000,000	900,000
H.C. Wainwright & Co., LLC	1,666,666	250,000

Total

33,333,334

5,000,000

SCHEDULE II

(a) Pricing Information

Price to public: \$1.50 per share
Number of Firm Shares: 33,333,334
Optional Shares: 5,000,000

Issuer Free Writing Prospectus Dated October 25, 2017

(b) Issuer Free Writing Prospectuses not included in the Pricing Disclosure Package

None.

SCHEDULE A

Youseff El Zein

Pillar Pharmaceuticals I, L.P.

Pillar Pharmaceuticals II, L.P.

Pillar Pharmaceuticals III, L.P.

Pillar Pharmaceuticals IV, L.P.

Pillar Pharmaceuticals V, L.P.

Participation Besancon

SCHEDULE B

Form of Lock-Up Agreement

Idera Pharmaceuticals, Inc.

Lock-Up Agreement

, 2017

J.P. Morgan Securities LLC
Goldman Sachs & Co. LLC

c/o J.P. Morgan Securities LLC
383 Madison Avenue
New York, NY 10179

c/o Goldman Sachs & Co. LLC
200 West Street,
New York, New York 10282

Re: Idera Pharmaceuticals, Inc. - Lock-Up Agreement

Ladies and Gentlemen:

The undersigned understands that you, as representatives (the "Representatives"), propose to enter into an Underwriting Agreement on behalf of the several Underwriters named in Schedule I to such agreement (collectively, the "Underwriters"), with Idera Pharmaceuticals, Inc., a Delaware corporation (the "Company"), providing for a public offering (the "Offering") of the Common Stock of the Company (the "Shares") pursuant to a prospectus (the "Prospectus") to be filed with the Securities and Exchange Commission (the "SEC").

In consideration of the agreement by the Underwriters to offer and sell the Shares, and of other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the undersigned agrees that, during the period specified in the following paragraph (the "Lock-Up Period"), the undersigned will not offer, sell, contract to sell, pledge, grant any option to purchase, make any short sale or otherwise dispose of any shares of Common

Stock of the Company, or any options or warrants to purchase any shares of Common Stock of the Company, or any securities convertible into, exchangeable for or that represent the right to receive shares of Common Stock of the Company, whether now owned or hereinafter acquired, owned directly by the undersigned (including holding as a custodian) or with respect to which the undersigned has beneficial ownership within the rules and regulations of the SEC (collectively the "Undersigned's Shares"). The foregoing restriction is expressly agreed to preclude the undersigned from engaging in any hedging or other transaction which is designed to or which reasonably could be expected to lead to or result in a sale or disposition of the Undersigned's Shares even if such Shares would be disposed of by someone other than the undersigned. Such prohibited hedging or other transactions would include without limitation any short sale or any purchase, sale or grant of any right (including without limitation any put or call option) with respect to any of the Undersigned's Shares or with respect to any security that includes, relates to, or derives any significant part of its value from such Shares. If the undersigned is an officer or director of the issuer, the undersigned further agrees that the

foregoing provisions shall be equally applicable to any issuer-directed Shares the undersigned may purchase in the Offering.

The initial Lock-Up Period will commence on the date of this Lock-Up Agreement and continue for 90 days after the public offering date set forth on the final prospectus used to sell the Shares (the "Public Offering Date") pursuant to the Underwriting Agreement.(1)

Notwithstanding the foregoing, the undersigned may transfer the Undersigned's Shares (i) as a *bona fide* gift or gifts, provided that the donee or donees thereof agree to be bound in writing by the restrictions set forth herein, (ii) to any trust for the direct or indirect benefit of the undersigned or the immediate family of the undersigned, provided that the trustee of the trust agrees to be bound in writing by the restrictions set forth herein, and provided further that any such transfer shall not involve a disposition for value, (iii) by will, other testamentary document or intestate succession, provided that any such recipient agrees to be bound in writing by the restrictions set forth herein, and provided further that any such transfer shall not involve a disposition for value, or (iv) with the prior written consent of each Representative on behalf of the Underwriters. For purposes of this Lock-Up Agreement, "immediate family" shall mean any relationship by blood, marriage or adoption, not more remote than first cousin. In addition, notwithstanding the foregoing, if the undersigned is an entity, the undersigned may transfer the capital stock of the Company to any affiliate of the undersigned or any investment fund or other entity controlled or managed by the undersigned in a transaction; provided, however, that in any such case, (A) it shall be a condition to the transfer that the transferee execute an agreement stating that the transferee is receiving and holding such capital stock subject to the provisions of this Agreement and there shall be no further transfer of such capital stock except in accordance with this Agreement, (B) any such transfer shall not involve a disposition for value and (C) no public announcement or filing under Section 16(a) of the Exchange Act reporting a reduction in beneficial ownership of shares of Common Stock shall be required or shall be voluntarily made during the Lock-up Period. The undersigned also agrees and consents to the entry of stop transfer instructions with the Company's transfer agent and registrar against the transfer of the Undersigned's Shares except in compliance with the foregoing restrictions.

In addition to the allowed transfers listed above, during the Lock-Up Period, the undersigned may (x) transfer shares to the Company in connection with the exercise of the options set forth on Exhibit A hereto that expire by their terms during the Lock-Up Period solely to the extent necessary to cover the payment of the aggregate exercise price with respect to such options and any related tax withholding obligations, provided any filing under Section 16(a) of the Exchange Act with respect to such exercise and transfer indicates in a footnote on such filing that the sale is solely to satisfy the exercise price and related tax withholding from expiring stock options; and (y) establish a trading plan pursuant to Rule 10b5-1 under the Exchange Act, for the transfer of shares of Common Stock or other securities, provided that such plan does not provide for the transfer of shares of Common Stock or other securities during the Lock-Up Period and provided further no public announcement or filing under the Exchange Act regarding the establishment of such plan shall be required of or voluntarily made by or on behalf of the undersigned or the Company during the Lock-Up Period.(2)

Anything to the contrary notwithstanding, if (i) the Underwriting Agreement does not become effective by December 31, 2017, (ii) after becoming effective, the Underwriting Agreement (other than the provisions thereof which survive termination) shall terminate or be terminated prior to payment for and delivery of the Shares to be sold thereunder or (iii) prior to the Underwriting Agreement becoming effective, the Company notifies the Representatives in writing that it does not intend to proceed with the Offering, this Lock-Up Agreement shall lapse and become null and void and the undersigned shall be released from all obligations under this Lock-Up Agreement.

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- (1) In the Lock-Up Agreements signed by Youssef El Zein, Pillar Pharmaceuticals I, L.P., Pillar Pharmaceuticals II, L.P., Pillar Pharmaceuticals III, L.P., Pillar Pharmaceuticals IV, L.P., Pillar Pharmaceuticals V, L.P. and Participation Besancon, the initial Lock-Up Period ends on November 30, 2017.
- (2) In the Lock-Up Agreements signed by Pillar Pharmaceuticals I, L.P., Pillar Pharmaceuticals II, L.P., Pillar Pharmaceuticals III, L.P., Pillar Pharmaceuticals IV, L.P., Pillar Pharmaceuticals V, L.P. and Participation Besancon, an additional subclause (z) states that such shareholders may pledge or hypothecate up to an aggregate of 22,788,247 shares of Common Stock to a lender as collateral for a full recourse loan.
-

The undersigned understands that the Company and the Underwriters are relying upon this Lock-Up Agreement in proceeding toward consummation of the Offering. The undersigned hereby represents and warrants that the undersigned has full power and authority to enter into this Lock-Up Agreement. The undersigned further understands that this Lock-Up Agreement is irrevocable and shall be binding upon the undersigned's heirs, legal representatives, successors, and assigns.

This Lock-Up Agreement and any claim, controversy or dispute arising under or related to this Lock-Up Agreement shall be governed by, and construed in accordance with, the laws of the State of New York, without regard to the conflict of laws principles thereof.

[Signature page follows]

Very truly yours,

Exact Name of Shareholder

Authorized Signature

Exhibit A

[None.]

October 26, 2017

+1 617 526 6000 (t)
+1 617 526 5000 (f)
wilmerhale.comIdera Pharmaceuticals, Inc.
167 Sidney Street
Cambridge, MA 02139Re: Registration Statement on Form S-3

Ladies and Gentlemen:

This opinion is being furnished to you in connection with (i) the Registration Statement on Form S-3 (File No. 333-219851) (the "Registration Statement") filed by Idera Pharmaceuticals, Inc., a Delaware corporation (the "Company"), with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act"), for the registration of an aggregate of 38,333,334 shares (the "Shares") of common stock, \$0.001 par value per share (the "Common Stock") of the Company, including up to 5,000,000 shares issuable upon exercise of an option to purchase additional shares granted by the Company.

The Shares are to be issued and sold by the Company pursuant to the underwriting agreement, dated as of October 25, 2017 (the "Underwriting Agreement"), among the Company and the several Underwriters listed on Schedule I to the Underwriting Agreement, the form of which is being filed with the Commission as Exhibit 1.1 to the Company's Current Report on Form 8-K, filed on the date hereof.

We are acting as counsel for the Company in connection with the issue and sale by the Company of the Shares pursuant to the Underwriting Agreement. We have examined and relied upon signed copies of the Registration Statement and a copy of the Prospectus Supplement, each as filed with the Commission. We have also examined and relied upon the minutes of meetings of the stockholders and the Board of Directors of the Company as provided to us by the Company, the Certificate of Incorporation and By-Laws of the Company, each as restated and/or amended to date, and such other documents as we have deemed necessary for purposes of rendering the opinions hereinafter set forth.

In our examination of the foregoing documents, 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 copies, the authenticity of the originals of such latter documents and the legal capacity of all signatories to such documents.

We also express no opinion herein as to any laws other than the General Corporation Law of the State of Delaware and the federal laws of the United States of America.

Wilmer Cutler Pickering Hale and Dorr LLP, 60 State Street, Boston, Massachusetts 02109

Beijing Berlin Boston Brussels Denver Frankfurt London Los Angeles New York Oxford Palo Alto Washington

Based upon and subject to the foregoing, we are of the opinion that the Shares have been duly authorized for issuance and, when the Shares are issued and paid for in accordance with the terms and conditions of the Underwriting Agreement, the Shares will be validly issued, fully paid and non-assessable.

Please note that we are opining only as to the matters expressly set forth herein, and no opinion should be inferred as to any other matters. This opinion is based upon currently existing statutes, rules, regulations and judicial decisions, and we disclaim any obligation to advise you of any change in any of these sources of law or subsequent legal or factual developments which might affect any matters or opinions set forth herein.

We hereby consent to the filing of this opinion in accordance with the requirements of Item 601(b)(5) of Regulation S-K under the Securities Act with the Commission as an exhibit to the Current Report on Form 8-K to be filed by the Company on the date hereof in connection with the issue and sale of the Shares and to the use of our name in the Prospectus Supplement under the caption "Legal matters." In giving such consent, we do not hereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission.

Very truly yours,

WILMER CUTLER PICKERING
HALE AND DORR LLPBy: /s/ Stuart M. Falber
Stuart M. Falber, a Partner



Idera Pharmaceuticals Announces Pricing of Public Offering of Common Stock

CAMBRIDGE, Mass. and EXTON, Pa. — (GLOBE NEWSWIRE)— October 26, 2017—Idera Pharmaceuticals, Inc. (NASDAQ: IDRA) (“Idera” or the “Company”) today announced the pricing of its underwritten public offering of 33,333,334 shares of its common stock at a public offering price of \$1.50 per share. The Company has granted the underwriters a 30-day option to purchase up to an additional 5,000,000 shares of common stock. All of the shares in the offering are to be sold by Idera. The offering is expected to close on or about October 30, 2017, subject to customary closing conditions.

The net proceeds to Idera from this offering are expected to be approximately \$46.8 million, after deducting underwriting discounts and commissions and estimated offering expenses. Idera intends to use the net proceeds from this offering, together with existing cash, cash equivalents and investments, to advance the development of IMO-2125 in its immuno-oncology program and for working capital and other general corporate purposes.

J.P. Morgan and Goldman Sachs & Co. LLC are acting as joint bookrunning managers on the transaction. Barclays is also acting as a joint bookrunning manager on the transaction. H.C. Wainwright & Co. is acting as a co-manager on the transaction.

The shares are being offered by the Company pursuant to a shelf registration statement initially filed with the Securities and Exchange Commission (the “SEC”) on August 10, 2017 and declared effective by the SEC on September 8, 2017. A preliminary prospectus supplement describing the terms of the offering was filed with the SEC on October 24, 2017. The final prospectus supplement relating to the offering will be filed with the SEC and will form a part of the effective registration statement, and will also be available on the SEC’s website at <http://www.sec.gov>. The offering will be made only by means of the written prospectus and prospectus supplement that form a part of the registration statement. When available, copies of the final prospectus supplement and the accompanying prospectus relating to the securities being offered may also be obtained from J.P. Morgan Securities LLC, c/o Broadridge Financial Solutions, 1155 Long Island Avenue, Edgewood, NY 11717 (telephone: 866-803-9204); from Goldman Sachs & Co. LLC, Attention: Prospectus Department, 200 West Street, New York, NY 10282, or by telephone at (866) 471-2526 or e-mail at prospectusgroup-ny@ny.email.gs.com; or from Barclays Capital Inc., c/o Broadridge Financial Solutions, 1155 Long Island Avenue, Edgewood, NY 11717, or by telephone at (888) 603-5847 or email at barclaysprospectus@broadridge.com.

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

About Idera Pharmaceuticals, Inc.

Harnessing the approach of the earliest researchers in immunotherapy and the company’s vast experience in developing proprietary immunology platforms, Idera’s lead development program is focused on priming the immune system to play a more powerful role in fighting cancer, ultimately increasing the number of people who can benefit from immunotherapy. Idera continues to invest in research and development, and is committed to working with investigators and partners who share the common goal of addressing the unmet needs of patients suffering from rare, life-threatening diseases.

Forward-Looking Statements

This press release contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. All statements, other than statements of historical fact, included or incorporated in this press release are forward-looking statements. The words “believes,” “anticipates,” “estimates,” “plans,” “expects,” “intends,” “may,” “could,” “should,” “potential,” “likely,” “projects,” “continue,” “will,” and “would” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. Idera cannot guarantee that it will actually achieve the plans, intentions or expectations disclosed in its forward-looking statements and you should not place undue reliance on the Company’s forward-looking statements. There are a number of important factors that could cause Idera’s actual results to differ materially from those indicated or implied by its forward-looking statements. Factors that may cause such a difference include, without limitation, risks and uncertainties related to whether or not Idera will be able to complete the public offering and raise capital through the sale of shares of common stock, the satisfaction of customary closing conditions related to the public public offering, the impact of general economic, industry or political conditions in the United States or internationally, and such other important factors as are set forth under the caption “Risk Factors” in the Company’s Annual Report on Form 10-K for the period ended December 31, 2016. Although Idera may elect to do so at some point in the future, the Company does not assume any obligation to update any forward-looking statements and it disclaims any intention or obligation to update or revise any forward-looking statement, whether as a result of new information, future events or otherwise.

Source: Idera Pharmaceuticals, Inc.

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