
**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

FORM 8-K

CURRENT REPORT

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

Date of report (Date of earliest event reported): **December 11, 2018**

RA PHARMACEUTICALS, INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

001- 37926
(Commission
File Number)

26-2908274
(I.R.S. Employer
Identification No.)

87 Cambridge Park Drive
Cambridge, MA
(Address of principal executive offices)

02140
(Zip Code)

(617) 401-4060
(Registrant's telephone number, include area code)

Not Applicable
(Former Name or Former Address, if Changed Since Last Report)

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

- 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 8.01. Other Events.

On December 11, 2018, Ra Pharmaceuticals, Inc. (the “Company”) entered into an underwriting agreement (the “Underwriting Agreement”) with Jefferies LLC, BMO Capital Markets Corp. and Stifel, Nicolaus & Company, Incorporated, as representatives of the several underwriters named therein (collectively, the “Underwriters”), in connection with the public offering, issuance and sale by the Company of 8,387,097 shares of the Company’s common stock, \$0.001 par value per share, at a public offering price of \$15.50 per share, less underwriting discounts and commissions, pursuant to an effective shelf registration statement on Form S-3 (Registration No. 333-221266) and a related prospectus supplement filed with the Securities and Exchange Commission. Under the terms of the Underwriting Agreement, the Company also granted the Underwriters an option exercisable for 30 days to purchase up to an additional 1,258,064 shares of its common stock at the public offering price, less underwriting discounts and commissions. On December 12, 2018, the Underwriters exercised their option to purchase additional shares in full. The closing of the offering and the option exercise is expected to occur on or about December 14, 2018, subject to the satisfaction of customary closing conditions.

The Company expects to receive net proceeds from the offering of approximately \$140.2 million, after deducting underwriting discounts and commissions and estimated offering expenses payable by the Company. The Company intends to use the net proceeds of the offering to fund the clinical development of zilucoplan, including the Phase 3 clinical program in gMG and the advancement of other pipeline programs, and for working capital and general corporate and administrative expenses.

The Underwriting Agreement contains customary representations, warranties and agreements by the Company, customary conditions to closing, indemnification obligations of the Company and the Underwriters, including for liabilities under the Securities Act of 1933, as amended, other obligations of the parties and termination provisions.

The foregoing description of the Underwriting Agreement is not complete and is qualified in its entirety by reference to the full text of the Underwriting Agreement, a copy of which is filed as Exhibit 1.1 to this Current Report on Form 8-K and is incorporated by reference herein.

Latham & Watkins LLP, counsel to the Company, has issued an opinion to the Company, dated December 14, 2018, regarding the validity of the shares of common stock to be issued and sold in the offering. A copy of the opinion is filed as Exhibit 5.1 to this Current Report on Form 8-K.

Item 9.01. Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Description
1.1	<u>Underwriting Agreement, dated December 11, 2018, between the Company and Jefferies LLC, BMO Capital Markets Corp. and Stifel, Nicolaus & Company, Incorporated, as representatives of the several underwriters named therein.</u>
5.1	<u>Opinion of Latham & Watkins LLP.</u>
23.1	<u>Consent of Latham & Watkins LLP (included in Exhibit 5.1).</u>

SIGNATURES

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

RA PHARMACEUTICALS, INC.

Date: December 14, 2018

By: /s/ David C. Lubner

David C. Lubner

Executive Vice President and Chief Financial Officer

8,387,097 Shares

RA PHARMACEUTICALS, INC.

Common Stock

UNDERWRITING AGREEMENT

December 11, 2018

Jefferies LLC
BMO Capital Markets Corp.
Stifel, Nicolaus & Company, Incorporated
As Representatives of the Several Underwriters,

c/o Jefferies LLC
520 Madison Avenue
New York, N.Y. 10022

c/o BMO Capital Markets Corp.
3 Times Square, 25th Floor
New York, N.Y. 10036

c/o Stifel, Nicolaus & Company, Incorporated
787 7th Avenue, 11th Floor
New York, N.Y. 10019

Dear Sir or Madam:

1. *Introductory.* Ra Pharmaceuticals, Inc., a Delaware corporation (“**Company**”), agrees with Jefferies LLC (“**Jefferies**”), BMO Capital Markets Corp. (“**BMO**”) and Stifel, Nicolaus & Company, Incorporated (“**Stifel**”) and the several Underwriters named in Schedule A hereto (collectively, the “**Underwriters**”), for whom Jefferies, BMO and Stifel are acting as representatives (in such capacity, the “**Representatives**”), to issue and sell to the several Underwriters 8,387,097 shares (“**Firm Securities**”) of its common stock, par value \$0.001 per share (“**Securities**”), and also agrees to issue and sell to the Underwriters, at the option of the Underwriters, an aggregate of not more than 1,258,064 additional shares (“**Optional Securities**”) of its Securities as set forth below. The Firm Securities and the Optional Securities are herein collectively called the “**Offered Securities**”.

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

(a) *Filing and Effectiveness of Registration Statement; Certain Defined Terms.* The Company has filed with the Commission a registration statement on Form S-3 (No. 333-221266), including a related prospectus or prospectuses, covering the registration of the Offered Securities under the Act, which has become effective. “**Initial Registration Statement**” at any particular time, means such registration statement in the form then filed with the Commission, including any amendment thereto, any document incorporated by reference therein and all 430B Information and all 430C Information with respect to such registration statement, that in any case has not been superseded or modified. “Registration Statement” without reference to a time means the Registration Statement as of the Effective Time. For purposes of this definition, 430B Information shall be considered to be included in the Registration Statement as of the time specified in Rule 430B.

The Company may also have filed, or may file with the Commission, a Rule 462(b) registration statement covering the registration of Offered Securities. At any particular time, this Rule 462(b) registration statement, in the form then on file with the Commission, including the contents of the Initial Registration Statement incorporated by reference therein and including all 430B Information and all 430C Information, that in any case has not then been superseded or modified, shall be referred to as the “**Additional Registration Statement**.” As of the time of execution and delivery of this Agreement, the Initial Registration Statement has been declared effective under the Act and is not proposed to be amended. Any Additional Registration Statement has or will become effective upon filing with the Commission pursuant to Rule 462(b) and is not proposed to be amended. The Offered Securities all have been or will be duly registered under the Act pursuant to the Initial Registration Statement and, if applicable, the Additional Registration Statement.

For purposes of this Agreement:

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

“**430C Information**” with respect to any Registration Statement, means information included in a prospectus then deemed to be a part of such Registration Statement pursuant to Rule 430C.

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

“**Applicable Time**” means 5:30 p.m. (Eastern time) on the date of this Agreement.

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

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

“**Effective Time**” with respect to the Initial Registration Statement or, if filed prior to the execution and delivery of this Agreement, the Additional Registration Statement means the date and time as of which such Registration Statement was declared effective by the Commission or has become effective upon filing pursuant to Rule 462, and as of the time of the first contract of sale for the Offered Securities. If an Additional Registration Statement has not been filed prior to the execution and delivery of this Agreement but the Company has advised the Representatives that it proposes to file one, “**Effective Time**” with respect to such Additional Registration Statement means the date and time as of which such Registration Statement is filed and becomes effective pursuant to Rule 462(b), and as of the time of the first contract of sale for the Offered Securities.

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

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

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

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

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

The Initial Registration Statement and the Additional Registration Statement, if any, are referred to collectively as the “**Registration Statements**” and individually as a “**Registration Statement**”. A “**Registration Statement**” with reference to a particular time means the Initial Registration Statement and any Additional Registration Statement as of such time. A “**Registration Statement**” without reference to a time means such Registration Statement as of its Effective Time.

“**Rules and Regulations**” means the rules and regulations of the Commission.

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

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

“**Testing-the-Waters Communication**” means any oral or written communication with potential investors undertaken in reliance on Section 5(d) of the Act.

“**Testing-the-Waters Writing**” means any Testing-the-Waters Communication that is a written communication within the meaning of Rule 405 under the Act.

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

(a) *Compliance with Securities Act Requirements.* (i) (A) At the time the Initial Registration Statement initially became effective, (B) at the time of each amendment thereto for the purposes of complying with Section 10(a)(3) of the Act (whether by post-effective amendment, incorporated report or form of prospectus), (C) at the Effective Time relating to the Offered Securities and (D) on the Closing Date, each of the Initial Registration Statement and the Additional Registration Statement (if any) conformed and will conform in all material respects to the requirements of the Act and the Rules and Regulations, and did not and will not include any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein not misleading, and (ii) (A) on its date, (B) at the time of filing of the Final Prospectus pursuant to Rule 424(b) or (if no such filing is required) at the Effective Time of the Additional Registration Statement in which the Final Prospectus is included, and (C) on each Closing Date, the Final Prospectus will conform in all material respects to the requirements of the Act and the Rules and Regulations and will not include any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances in which they were made, not misleading. The preceding sentence does not apply to statements in or omissions from any such document based upon written information furnished to the Company by any Underwriter through the Representatives specifically for use therein, it being understood and agreed that the only such information is that described as such in Section 8(b) hereof.

(b) *Shelf Registration Statement.* The date of this Agreement is not more than three years subsequent to the initial effective time of the Initial Registration Statement. If, immediately prior to the third anniversary of the initial effective time of the Initial Registration Statement any of the Offered Securities remain unsold by the Underwriters, the Company will prior to that third anniversary file, if it has not

already done so, a new shelf registration statement relating to the Offered Securities, in a form satisfactory to the Representatives, will use its best efforts to cause such registration statement to be declared effective within 180 days after that third anniversary, and will take all other action necessary or appropriate to permit the public offering and sale of the Offered Securities to continue as contemplated in the expired registration statement relating to the Offered Securities. References herein to a Registration Statement shall include such new shelf registration statement.

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

(d) *General Disclosure Package.* As of the Applicable Time, none of (i) the General Use Issuer Free Writing Prospectus(es) issued at or prior to the Applicable Time, the preliminary prospectus supplement, dated December 10, 2018, including the base prospectus, dated November 14, 2017 (which is the most recent Statutory Prospectus distributed to investors generally), and the other information, if any, stated in Schedule B to this Agreement to be included in the General Disclosure Package, all considered together (collectively, the “**General Disclosure Package**”), (ii) any individual Limited Use Issuer Free Writing Prospectus, when considered together with the General Disclosure Package, or (iii) any individual Testing-the-Waters Communication, when considered together with the General Disclosure Package, included any untrue statement of a material fact or omitted to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading. The preceding sentence does not apply to statements in or omissions from any Statutory Prospectus, any Issuer Free Writing Prospectus or any Testing-the-Waters Communication made in reliance upon and in conformity with written information furnished to the Company by any Underwriter through the Representatives relating to such Underwriter specifically for use therein, it being understood and agreed that the only such information furnished by any Underwriter consists of the information described as such in Section 8(b) hereof.

(e) *Incorporated Documents.* The documents incorporated by reference in the Registration Statement and the General Disclosure Package, when they were filed or became effective with the Commission, conformed in all material respects to

the requirements of the Exchange Act and the rules and regulations thereunder and none of such documents contained any 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, in the light of the circumstances under which they were made, not misleading; and any further documents so filed and incorporated by reference in the Registration Statement or the General Disclosure Package, 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 will not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading.

(f) *Issuer Free Writing Prospectuses.* Each Issuer Free Writing Prospectus, as of its issue date and at all subsequent times through the completion of the public offer and sale of the Offered Securities or until any earlier date that the Company notified or notifies the Representatives as described in the next sentence, did not, does not and will not include any information that conflicted, conflicts or will conflict with the information then contained in the Registration Statement. If at any time following issuance of an Issuer Free Writing Prospectus there occurred or occurs an event or development as a result of which such Issuer Free Writing Prospectus conflicted or would conflict with the information then contained in the Registration Statement or as a result of which such Issuer Free Writing Prospectus, if republished immediately following such event or development, would include an untrue statement of a material fact or omitted or would omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading, (i) the Company has promptly notified or will promptly notify the Representatives and (ii) the Company has promptly amended or will promptly amend or supplement such Issuer Free Writing Prospectus to eliminate or correct such conflict, untrue statement or omission. The preceding sentence does not apply to statements in or omissions from any Issuer Free Writing Prospectus made in reliance upon and in conformity with written information furnished to the Company by any Underwriter through the Representatives specifically for use therein, it being understood and agreed that the only such information furnished by any Underwriter consists of the information described as such in Section 8(b) hereof.

(g) *Good Standing of the Company.* The Company has been duly incorporated and is existing and 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 General Disclosure Package and the Final Prospectus; and the Company is duly qualified to do business as a foreign corporation in good standing in all other jurisdictions in which its ownership or lease of property or the conduct of its business requires such qualification except where the failure to be so qualified or in such good standing would not, individually or in

the aggregate, result in a material adverse effect on the condition (financial or otherwise), results of operations, business, properties or prospects of the Company and its subsidiaries taken as a whole (a “**Material Adverse Effect**”).

(h) *Subsidiaries.* Each subsidiary of the Company has been duly incorporated and is existing and in good standing under the laws of the jurisdiction of its incorporation, with power and authority (corporate and other) to own its properties and conduct its business as described in the General Disclosure Package and the Final Prospectus; and each subsidiary of the Company is duly qualified to do business as a foreign corporation in good standing in all other jurisdictions in which its ownership or lease of property or the conduct of its business requires such qualification, except where the failure to be so qualified or in such good standing would not reasonably be expected to have a Material Adverse Effect; all of the issued and outstanding capital stock of each subsidiary of the Company has been duly authorized and validly issued and is fully paid and nonassessable; and the capital stock of each subsidiary owned by the Company, directly or through subsidiaries, is owned free from liens, encumbrances and defects.

(i) *Offered Securities.* The Offered Securities and all other outstanding shares of capital stock of the Company have been duly authorized; the authorized equity capitalization of the Company is as set forth in the General Disclosure Package and the Final Prospectus; all outstanding shares of capital stock of the Company are, and, when the Offered Securities have been delivered and paid for in accordance with this Agreement on each Closing Date, such Offered Securities will have been, validly issued, fully paid and nonassessable, will conform in all material respects to the information in the General Disclosure Package and to the description of such Offered Securities contained in the Final Prospectus; the stockholders of the Company have no preemptive rights with respect to the Offered Securities; and none of the outstanding shares of capital stock of the Company have been issued in violation of any preemptive or similar rights of any security holder.

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

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

“**registration rights**”), and any person to whom the Company has granted registration rights has agreed not to exercise such rights or is contractually prohibited from exercising such rights until after the expiration of the Lock-Up Period referred to in Section 5(l) hereof.

(l) *Listing.* The Offered Securities have been approved for listing on the Nasdaq Stock Market, subject to notice of issuance.

(m) *Absence of Further Requirements.* No consent, approval, authorization, or order of, or filing or registration with, any person (including any governmental agency or body or any court) is required for the consummation of the transactions contemplated by this Agreement in connection with the offering, issuance and sale of the Offered Securities by the Company, except such as have been obtained, or made and such as may be required under state securities laws.

(n) *Title to Property.* Except as disclosed in the General Disclosure Package and the Final Prospectus (i) the Company and its subsidiaries have good and marketable title to all real properties and all other tangible personal properties and assets owned by them, in each case free from liens, charges, encumbrances and defects that would materially affect the value thereof or materially interfere with the use made or to be made thereof by them and (ii) the Company and its subsidiaries hold any leased real or personal property under valid and enforceable leases with no terms or provisions that would materially interfere with the use made or to be made thereof by them.

(o) *Absence of Defaults and Conflicts Resulting from Transaction.* The execution, delivery and performance of this Agreement, and the issuance and sale of the Offered Securities will not result in a breach or violation of any of the terms and provisions of, or constitute a default or a Debt Repayment Triggering Event (as defined below) under, or result in the imposition of any lien, charge or encumbrance upon any property or assets of the Company or any of its subsidiaries pursuant to, (i) the charter or by-laws of the Company or any of its subsidiaries, (ii) any statute, rule, regulation or order of any governmental agency or body or any court, domestic or foreign, having jurisdiction over the Company or any of its subsidiaries or any of their properties, or (iii) any agreement or instrument to which the Company or any of its subsidiaries is a party or by which the Company or any of its subsidiaries is bound or to which any of the properties of the Company or any of its subsidiaries is subject, except with respect to clauses (ii) and (iii) above where such breach, violation or default would not have a Material Adverse Effect and as would not have a material adverse effect on the consummation of the transactions contemplated by this Agreement; a “**Debt Repayment Triggering Event**” means any event or condition that gives, or with the giving of notice or lapse of time would give, the holder of any note, debenture, or other evidence of indebtedness (or any person acting on such holder’s behalf) the right to require the repurchase, redemption or

repayment of all or a portion of such indebtedness by the Company or any of its subsidiaries.

(p) *Absence of Existing Defaults and Conflicts.* Neither the Company nor any of its subsidiaries is in violation of its respective charter or by-laws or in default (or with the giving of notice or lapse of time would be in default) under any existing obligation, agreement, covenant or condition contained in any indenture, loan agreement, mortgage, lease or other agreement or instrument to which any of them is a party or by which any of them is bound or to which any of the properties of any of them is subject, except such defaults that would not reasonably be expected to have a Material Adverse Effect.

(q) *Authorization of Agreement.* This Agreement has been duly authorized, executed and delivered by the Company.

(r) *Possession of Licenses and Permits.* The Company and its subsidiaries possess, and are in compliance in all material respects with the terms of, all applicable certificates, franchises, licenses, approvals, clearances, exemptions, registrations, consents, permits and other authorizations (collectively, "**Licenses**") necessary for the conduct of the business, including, without limitation, all such Licenses required by the U.S. Food and Drug Administration ("**FDA**"), and all such Licenses are valid and in full force and effect. The Company and each of its subsidiaries has fulfilled and performed all of their material obligations with respect to the Licenses and, 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 License. Neither the Company nor any of its subsidiaries has received any notice of proceedings related to the revocation of, modification of, or non-compliance with, any Licenses that, if determined adversely to the Company or any of its subsidiaries, would, individually or in the aggregate, have or reasonably be expected to have a Material Adverse Effect.

(s) *Studies.* The preclinical studies and clinical trials conducted by, on behalf of or sponsored by the Company or its subsidiaries, or in which the Company or its subsidiaries participated, were and, if still pending are being, conducted in all material respects in accordance with the experimental protocols established for each study and trial and with all applicable local, state and federal laws, rules and regulations, including, without limitation, the Federal Food, Drug, and Cosmetic Act and its applicable implementing regulations; the descriptions of the results of such studies and trials contained in the General Disclosure Package or the Final Prospectus are accurate and complete in all material respects and fairly present the data derived from such studies and trials; except to the extent disclosed in the General Disclosure Package and the Final Prospectus, the Company is not aware of any studies or trials, the results of which are inconsistent with or otherwise call into question the study and trial results described or referred to in the General Disclosure Package or the Final Prospectus; and neither the FDA nor any applicable foreign

regulatory agency has commenced, or, to the knowledge of the Company, threatened to initiate, any action to place a hold order on, or otherwise terminate, delay or suspend, any proposed or ongoing preclinical studies or clinical trials conducted or proposed to be conducted by or on behalf of the Company.

(t) *Health Care Laws and Compliance.* The Company and each of its subsidiaries has operated and currently is in compliance in all material respects with all applicable Health Care Laws (defined herein), and has not engaged in activities which are, as applicable, cause for false claims liability, civil penalties, or mandatory or permissive exclusion from Medicare, Medicaid, or any other state or federal health care program. For purposes of this Agreement, "Health Care Laws" shall mean the federal Anti-kickback Statute (42 U.S.C. § 1320a-7b(b)), the Physician Payments Sunshine Act (42 U.S.C. § 1320a-7h), the civil False Claims Act (31 U.S.C. §§ 3729 et seq.), the criminal False Claims Act (42 U.S.C. § 1320a-7b(a)), all criminal laws relating to health care fraud and abuse, including but not limited to 18 U.S.C. Sections 286 and 287, and the health care fraud criminal provisions, including 18 U.S.C. § 1347, under the Health Insurance Portability and Accountability Act of 1996 (42 U.S.C. § 1320d et seq.) ("HIPAA"), the exclusion laws (42 U.S.C. § 1320a-7), the civil monetary penalties law (42 U.S.C. § 1320a-7a), HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act (42 U.S.C. §§ 17921 et seq.), the Federal Food, Drug, and Cosmetic Act (21 U.S.C. §§ 301 et seq.), Medicare (Title XVIII of the Social Security Act), Medicaid (Title XIX of the Social Security Act), the regulations promulgated pursuant to such laws, and any other similar local, state or federal law and regulations. The Company has not received any FDA Form 483, notice of adverse finding, warning letter, untitled letter or other correspondence, communication or notice from the U.S. Food and Drug Administration or any other governmental or regulatory authority alleging or asserting noncompliance with any Health Care Laws applicable to the Company. The Company is not a party to nor has any ongoing reporting obligations pursuant to any corporate integrity agreements, deferred prosecution agreements, monitoring agreements, consent decrees, settlement orders, plans of correction or similar agreements with or imposed by any governmental or regulatory authority. Neither the Company nor any of its respective employees, officers or directors has been excluded, suspended or debarred from participation in any U.S. federal health care program or human clinical research or, to the knowledge of the Company after due inquiry, is subject to a governmental inquiry, investigation, proceeding, or other similar action that would reasonably be expected to result in debarment, suspension, or exclusion.

(u) *Absence of Labor Dispute.* No labor dispute with the employees of the Company or any of its subsidiaries exists or, to the knowledge of the Company, is imminent that would, individually or in the aggregate, have or reasonably be expected to have a Material Adverse Effect.

(v) *Possession of Intellectual Property.* Except as disclosed in the General Disclosure Package and the Final Prospectus, the Company and its subsidiaries own, possess or, to the knowledge of the Company, can acquire on reasonable terms sufficient trademarks, trade names, patent rights, copyrights, domain names, licenses, approvals, trade secrets, inventions, technology, know-how and other intellectual property and similar rights, including registrations and applications for registration thereof (collectively, “**Intellectual Property Rights**”) described in the General Disclosure Package and the Final Prospectus as owned or possessed by the Company and its subsidiaries or that are, to the Company’s knowledge, necessary or material to the conduct of the business now conducted or proposed in the General Disclosure Package or the Final Prospectus to be conducted by them. To the Company’s knowledge, none of the patents of the Company or its subsidiaries are invalid or unenforceable, in whole or in part, and the Company is unaware of any facts that would form a reasonable basis for such a determination. None of the Intellectual Property Rights of the Company or its subsidiaries, other than patents and patent applications, are invalid or unenforceable, in whole or in part, and the Company is unaware of any facts that would form a reasonable basis for such a determination. To the knowledge of the Company, there are no unreleased liens or security interests which have been filed against any of the patents owned by or licensed to the Company, except those that would not, individually or in the aggregate, have or reasonably be expected to have a Material Adverse Effect. Except as disclosed in the General Disclosure Package and the Final Prospectus, (i) the Company is not obligated to pay a material royalty, grant a license or provide other material consideration to any third party in connection with its Intellectual Property Rights; (ii) to the Company’s knowledge, there are no rights of third parties to any of the Intellectual Property Rights owned by the Company or its subsidiaries, in any field of use, other than the respective licensor to the Company of such Intellectual Property Rights; (iii) to the Company’s knowledge, there is no material infringement, misappropriation breach, default or other violation, or the occurrence of any event that with notice or the passage of time would constitute any of the foregoing, by the Company, its subsidiaries or third parties of any of the Intellectual Property Rights of the Company or its subsidiaries; (iv) there is no pending or, to the Company’s knowledge, threatened action, suit, proceeding or claim by others (a) challenging the Company’s or any of its subsidiary’s rights in or to, or the violation of any of the terms of, any of their Intellectual Property Rights; (b) challenging the validity, enforceability or scope of any such Intellectual Property Rights; or (c) that alleges the Company or any of its subsidiaries infringes, misappropriates or otherwise violates or conflicts with any Intellectual Property Rights or other proprietary rights of others, and, in each case, the Company is unaware of any facts which would form a reasonable basis for any such claim; (v) none of the Intellectual Property Rights used by the Company or its subsidiaries in their businesses has been obtained or is being used by the Company or its subsidiaries in violation of any contractual obligation binding on the Company, any of its subsidiaries in violation of the rights of any persons; and (vi) to the Company’s knowledge, no employee of the Company or any of its subsidiaries 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 any of its subsidiaries or actions undertaken by the employee while employed with the Company or any of its subsidiaries. To the knowledge of the Company, except as otherwise disclosed in the General Disclosure Package and the Final Prospectus, (1) neither the commercial development nor the sale of any of the proposed products or processes of the Company, as described in the General Disclosure Package or the Final Prospectus, infringes, misappropriates or otherwise violates, or would infringe, misappropriate or otherwise violate, upon the commercialization of such proposed products or processes, any existing Intellectual Property Rights of any third party; and (2) each current and former employee and consultant of the Company (a) has executed an inventions assignment and confidentiality agreement with the Company, on or about the respective date of hire, and signed copies of such agreements have been made available to the Representatives and their counsel; and (b) has signed or agreed to assign to the Company any and all Intellectual Property Rights he or she may possess or may have possessed that are related to the Company's business, as currently conducted and as proposed to be conducted, as described in the General Disclosure Package and the Final Prospectus, except where such failure to execute such agreement or to agree to assign such Intellectual Property Rights would not reasonably be expected to have a Material Adverse Effect. All patents and patent applications described in the General Disclosure Package and the Final Prospectus as being owned by or licensed to the Company or under which the Company has rights have, to the knowledge of the Company, been duly and properly filed and maintained; to the knowledge of the Company, the parties prosecuting such applications have complied with their duty of candor and disclosure to the U.S. Patent and Trademark Office (the "USPTO") in connection with such applications; and the Company is not aware of any facts required to be disclosed to the USPTO that were not disclosed to the USPTO and which would preclude the grant of a patent in connection with any such application or could form the basis of a finding of invalidity with respect to any patents that have issued with respect to such applications.

(w) *Environmental Laws.* Except as disclosed in the General Disclosure Package and the Final Prospectus, neither the Company nor any of its subsidiaries is in violation of any statute, any rule, regulation, decision or order of any governmental agency or body or any court, domestic or foreign, relating to the use, disposal or release of hazardous or toxic substances or relating to the protection or restoration of the environment or human exposure to hazardous or toxic substances (collectively, "**environmental laws**"), owns or operates any real property contaminated with any substance that is subject to any environmental laws, is liable for any off-site disposal or contamination pursuant to any environmental laws, or is subject to any claim relating to any environmental laws, which violation, contamination, liability or claim would, individually or in the aggregate, have or

reasonably be expected to have a Material Adverse Effect; and the Company is not aware of any pending investigation which might lead to such a claim.

(x) *Accurate Disclosure.* The statements in the General Disclosure Package and the Final Prospectus under the headings “Risk Factors — Risks Related to Our Intellectual Property”; “Business — Our Merck Collaboration and License Agreement”; “Business — Intellectual Property”; “Legal Proceedings”; “Certain Relationships and Related Party Transactions, and Director Independence”; “Description of Capital Stock”; and “Material U.S. Federal Income Tax Consequences to Non-U.S. Holders of our Common Stock,” insofar as such statements summarize legal matters, agreements, documents, licenses or proceedings discussed therein, are accurate and fair summaries of such legal matters, agreements, documents, licenses or proceedings and present the information required to be shown.

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

(z) *Statistical and Market-Related Data.* Any third-party statistical and market-related data included in the Registration Statements, a Statutory Prospectus, the General Disclosure Package or any Testing-the-Waters Writing are based on or derived from sources that the Company believes to be reliable and accurate.

(aa) *Internal Controls and Compliance with the Sarbanes-Oxley Act.* Except as set forth in the General Disclosure Package and the Final Prospectus, the Company, its subsidiaries and the Company’s Board of Directors (the “**Board**”) are in compliance with Sarbanes-Oxley (to the extent applicable) and all applicable Exchange Rules. The Company maintains a system of internal controls, including, but not limited to, disclosure controls and procedures, internal controls over accounting matters and financial reporting and legal and regulatory compliance controls (collectively, “**Internal Controls**”) that comply with the Securities Laws (to the extent applicable) and are sufficient to provide reasonable assurances that (i) transactions are executed in accordance with management’s general or specific authorizations, (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with U.S. General Accepted Accounting Principles (“**GAAP**”) and to maintain accountability for assets, (iii) access to assets is permitted only in accordance with management’s general or specific authorization and (iv) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences. The Internal Controls are, or upon consummation of the offering of the Offered Securities will be, overseen by the Audit Committee (the “**Audit Committee**”) of the Board in accordance with Exchange Rules. The Company has not publicly

disclosed or reported to the Audit Committee or the Board, and within the next 135 days the Company has no current reason to expect to publicly disclose or report to the Audit Committee or the Board, a “significant deficiency” or “material weakness” (each, as defined in Rule 12b-2 of the Exchange Act), a change in Internal Controls or fraud involving management or other employees who have a significant role in Internal Controls (each, an “**Internal Control Event**”), any violation of, or failure to comply with, the Securities Laws, or any matter which, if determined adversely, would, individually or in the aggregate, have or reasonably be expected to have a Material Adverse Effect.

(bb) *Absence of Accounting Issues.* A member of the Audit Committee has confirmed to the Chief Executive Officer or Chief Financial Officer of the Company that, except as set forth in the General Disclosure Package and the Final Prospectus, the Audit Committee is not reviewing or investigating, and the Company’s independent auditors have not recommended that the Audit Committee review or investigate, (i) adding to, deleting, changing the application of, or changing the Company’s disclosure with respect to, any of the Company’s material accounting policies; (ii) any matter which would reasonably be expected to result in a restatement of the Company’s financial statements for any annual or interim period during the current or prior three fiscal years; or (iii) any Internal Control Event.

(cc) *Litigation.* Except as disclosed in the General Disclosure Package and the Final Prospectus, there are no pending actions, suits or proceedings (including any inquiries or investigations by any court or governmental agency or body, domestic or foreign) against or affecting the Company, any of its subsidiaries or any of their respective properties that, if determined adversely to the Company or any of its subsidiaries, would, individually or in the aggregate, have or reasonably be expected to have a Material Adverse Effect, or would materially and adversely affect the ability of the Company to perform its obligations under this Agreement, or which are otherwise material in the context of the sale of the Offered Securities; and no such actions, suits or proceedings (including any inquiries or investigations by any court or governmental agency or body, domestic or foreign) are threatened or, to the Company’s knowledge, contemplated.

(dd) *Financial Statements.* The financial statements included in each Registration Statement and the General Disclosure Package and the Final Prospectus present fairly in all material respects the financial position of the Company and its consolidated subsidiaries as of the dates shown and their results of operations and cash flows for the periods shown, and such financial statements have been prepared in conformity with GAAP applied on a consistent basis; and the schedules to the financial statements included in each Registration Statement present fairly in all material respects the information required to be stated therein; and the assumptions used in preparing the pro forma financial data, if any, included in the General Disclosure Package and the Final Prospectus provide a reasonable basis for presenting the significant effects directly attributable to the transactions or events

described therein, the related pro forma adjustments give appropriate effect to those assumptions, and the pro forma columns therein reflect the proper application of those adjustments to the corresponding historical financial statement amounts. No other financial statements or schedules are required by Form S-3 or otherwise to be included in the General Disclosure Package or the Final Prospectus. The interactive data in eXtensible Business Reporting Language included in the General Disclosure Package and the Final Prospectus fairly presents the required information and has been prepared in accordance with the Commission's rules and guidelines applicable thereto.

(ee) *No Material Adverse Change in Business.* Except as disclosed in the General Disclosure Package and the Final Prospectus, since the end of the period covered by the latest audited financial statements included in the General Disclosure Package and the Final Prospectus (i) there has been no change, nor any development or event involving a prospective change, in the condition (financial or otherwise), results of operations, business, properties or prospects of the Company and its subsidiaries, taken as a whole that is material and adverse, (ii) except as disclosed in or contemplated by the General Disclosure Package and the Final Prospectus, there has been no dividend or distribution of any kind declared, paid or made by the Company on any class of its capital stock, (iii) except as disclosed in or contemplated by the General Disclosure Package and the Final Prospectus, there has been no material adverse change in the capital stock, short-term indebtedness, long-term indebtedness, net current assets or net assets of the Company and its subsidiaries, (iv) except as disclosed in the General Disclosure Package and the Final Prospectus, there has been no transaction entered into by the Company or any of its subsidiaries that is material to the Company and its subsidiaries taken as a whole and there is no transaction that is probable of being entered into by the Company or any of its subsidiaries that is material to the Company and its subsidiaries taken as a whole, other than transactions in the ordinary course of business, (v) except as disclosed in the General Disclosure Package and the Final Prospectus, there has been no obligation, direct or contingent, incurred by the Company or any of its subsidiaries that is material to the Company and its subsidiaries taken as a whole, except obligations incurred in the ordinary course of business and (vi) except as disclosed in the General Disclosure Package and the Final Prospectus, neither the Company nor any of its subsidiaries has sustained any material loss or material interference with any of their respective businesses from fire, explosion, flood or other calamity, whether or not covered by insurance, or from any labor disturbance or dispute or any action, order or decree of any court or arbitrator or governmental or regulatory authority.

(ff) *Investment Company Act.* The Company is not and, after giving effect to the offering and sale of the Offered Securities and the application of the proceeds thereof as described in the General Disclosure Package and the Final Prospectus, will not be an "investment company" as defined in the Investment Company Act of 1940, as amended (the "**Investment Company Act**").

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

(hh) *No Unlawful Payments.* Neither the Company nor any of its subsidiaries, nor any director, officer or employee of the Company or any of its subsidiaries nor, to the knowledge of the Company, any agent, affiliate or other person associated with or acting on behalf of the Company or any of its subsidiaries has (i) used any corporate funds for any unlawful contribution, gift, entertainment or other unlawful expense relating to political activity; (ii) made or taken an act in furtherance of an offer, promise or authorization of any direct or indirect unlawful payment or benefit to any foreign or domestic government official, “foreign official” (as defined in the U.S. Foreign Corrupt Practices Act of 1977, as amended, and the rules and regulations thereunder (collectively, the “FCPA”) or employee, including of any government-owned or controlled entity or of a public international organization, or any person acting in an official capacity for or on behalf of any of the foregoing, or any political party or party official or candidate for political office; (iii) violated or is in violation of any provision of the FCPA or any applicable law or regulation implementing the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, or committed an offence under the Bribery Act 2010 of the United Kingdom or any other applicable anti-bribery or anti-corruption law; or (iv) made, offered, agreed, requested or taken an act in furtherance of any unlawful bribe or other unlawful benefit, including, without limitation, any rebate, influence payment, payoff, kickback or other unlawful or improper payment or benefit; and the Company and its subsidiaries, any affiliate under the control of the Company or any of its subsidiaries and, to the Company’s knowledge, any affiliate not under control of the Company or any of its subsidiaries have conducted their respective businesses in compliance with the FCPA and have instituted, maintain and enforce, and will continue to maintain and enforce, policies and procedures designed to promote and ensure, and which are reasonably expected to continue to ensure, continued compliance with all applicable anti-bribery and anti-corruption laws.

(ii) *Anti-Money Laundering.* The operations of the Company and its subsidiaries are and have been conducted at all times in compliance with all applicable financial recordkeeping and reporting requirements, including those of the Bank Secrecy Act, as amended by Title III of the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act of 2001 (USA PATRIOT Act), and the applicable anti-money laundering statutes of all jurisdictions in which the Company or any of its subsidiaries conduct business, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any

governmental agency (collectively, the “**Anti-Money Laundering Laws**”), and no action, suit or proceeding by or before any court or governmental agency, authority or body or any arbitrator involving the Company or any of its subsidiaries with respect to the Anti-Money Laundering Laws is pending or, to the Company’s knowledge, threatened.

(jj) *No Conflicts with Sanctions Laws.*

(i) Neither the Company nor any of its subsidiaries, directors, officers, or employees, nor, to the knowledge of the Company, any agent, affiliate or other person associated with or acting on behalf of the Company or any of its subsidiaries is an individual or entity that is, or is owned or controlled by an individual or entity that is:

(A) the subject or 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 or the U.S. Department of State and including, without limitation, the designation as “specially designated national” or “blocked person”), the United Nations Security Council, the European Union, Her Majesty’s Treasury, the Swiss Secretariat of Economic Affairs, the Hong Kong Monetary Authority, the Monetary Authority of Singapore or other relevant sanctions authority (collectively, “**Sanctions**”), nor

(B) located, organized or resident in a country or territory that is the subject or target of Sanctions (including, without limitation, Cuba, Iran, North Korea, Sudan, Syria and Crimea (each, a “**Sanctioned Country**”)).

(ii) The Company will not, directly or indirectly, use the proceeds of the offering of the Offered Securities hereunder, or lend, contribute or otherwise make available such proceeds to any subsidiary, joint venture partner or other individual or entity:

(A) to fund or facilitate any activities or business of or with any individual or entity that, at the time of such funding or facilitation, is the subject or target of Sanctions;

(B) to fund or facilitate any activities of or business in any Sanctioned Country; or

(C) in any other manner that will result in a violation of Sanctions by any individual or entity (including any individual or

entity participating in the offering, whether as underwriter, advisor, investor or otherwise).

(iii) For the past five (5) years, the Company and its subsidiaries have not knowingly engaged in, are not now knowingly engaged in, and will not engage in, any dealings or transactions with any individual or entity that at the time of the dealing or transaction is or was the subject or target of Sanctions or with or in any Sanctioned Country.

(kk) *Tax Matters.* The Company and its subsidiaries have filed all federal, state, local and non-U.S. tax returns that are required to have been filed by them or have requested extensions thereof (except in any case in which the failure so to file would not reasonably be expected to have a Material Adverse Effect). Except as set forth in the General Disclosure Package and the Final Prospectus, the Company and its subsidiaries have paid all taxes (including any assessments, fines or penalties) required to be paid by them, except for any such taxes, assessments, fines or penalties currently being contested in good faith or as would not reasonably be expected to have a Material Adverse Effect. There are no deficiencies for taxes, including any interest and penalties thereon, with respect to the Company or any of its subsidiaries that have been claimed, proposed or assessed by any tax authority, except as would not reasonably be expected to have a Material Adverse Effect.

(ll) *Insurance.* (i) The Company and its subsidiaries are insured by insurers with appropriately rated claims paying abilities against such losses and risks and in such amounts as are prudent and customary for similarly sized companies in the businesses in which they are engaged; (ii) all material policies of insurance insuring the Company or any of its subsidiaries or their respective businesses, assets, employees, officers and directors are in full force and effect; (iii) the Company and its subsidiaries are in compliance with the terms of such policies and instruments in all material respects; and (iv) except in respect of certain legal proceedings disclosed in the General Disclosure Package and the Final Prospectus, there are no material claims by the Company or any of its subsidiaries under any such policy or instrument as to which any insurance company is denying liability or defending under a reservation of rights clause. Neither the Company nor any of its subsidiaries has (i) been refused any insurance coverage sought or applied or (ii) 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 necessary to continue its business at a cost that would not, individually or in the aggregate, have or reasonably be expected to have a Material Adverse Effect, except as set forth in or contemplated in the General Disclosure Package and the Final Prospectus.

(mm) *No Restrictions on Payments by Subsidiaries.* Except as described in the General Disclosure Package and the Final Prospectus, no subsidiary of the Company is currently prohibited, directly or indirectly, under any agreement or other

instrument to which it is a party or is subject, (i) from paying any dividends to the Company, (ii) from making any other distribution on such subsidiary's capital stock, (iii) from repaying to the Company any loans or advances to such subsidiary from the Company or (iv) from transferring any of such subsidiary's material properties or assets to the Company or any other subsidiary of the Company.

(nn) *ERISA Compliance.* Except as would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect: (i) each employee benefit plan, within the meaning of Section 3(3) of the Employee Retirement Income Security Act of 1974, as amended ("**ERISA**"), for which the Company or an ERISA Affiliate (which means, with respect to the Company, any member of any group of organizations described in Sections 414(b),(c),(m) or (o) of the Internal Revenue Code of 1986, as amended (the "**Code**") of which the Company is a member) would have any liability (each, a "**Plan**") has been maintained in compliance with its terms and the requirements of any applicable statutes, orders, rules and regulations, including but not limited to ERISA and the Code; (ii) no prohibited transaction, within the meaning of Section 406 of ERISA or Section 4975 of the Code, has occurred with respect to any Plan excluding transactions effected pursuant to a statutory or administrative exemption; (iii) for each Plan that is subject to the funding rules of Section 412 of the Code or Section 302 of ERISA, the minimum funding standards of Section 412 of the Code or Section 302 of ERISA, as applicable, have been satisfied (without taking into account any waiver thereof or extension of any amortization period) and are reasonably expected to be satisfied in the future (without taking into account any waiver thereof or extension of any amortization period); (iv) no "reportable event" (within the meaning of Section 4043(c) of ERISA) has occurred or is reasonably expected to occur; (v) neither the Company nor any of its ERISA Affiliates has incurred or reasonably expects to incur any material liability under Title IV of ERISA (other than contributions to the Plan or premiums to the Pension Benefit Guaranty Corporation, in the ordinary course and without default) in respect of a Plan (including a "multiemployer plan," within the meaning of Section 4001(a)(3) of ERISA); and (vi) there is no pending audit or investigation by the Internal Revenue Service, the U.S. Department of Labor, the Pension Benefit Guaranty Corporation or any other governmental agency or any foreign regulatory agency with respect to any Plan.

(oo) *Emerging Growth Company Status.* From the time of filing its first registration statement with the Commission (or, if earlier, the first date on which the Company engaged directly or through any person authorized to act on its behalf in any Testing-the-Waters Communications) through the date hereof, the Company has been and is an "emerging growth company," as defined in Section 2(a) of the Act (an "**Emerging Growth Company**").

(pp) *Testing-the-Waters Communication.* The Company (a) has not alone engaged in any Testing-the-Waters Communication and (b) has not authorized anyone

other than the Representatives to engage in Testing-the-Waters Communications. The Company reconfirms that the Representatives have been authorized to act on the Company's behalf in undertaking Testing-the-Waters Communication. The Company has not distributed any Testing-the-Waters Writing.

3. *Purchase, Sale and Delivery of Offered Securities.* On the basis of the representations, warranties and agreements and subject to the terms and conditions set forth herein, the Company agrees to sell to the several Underwriters, and each of the Underwriters agrees, severally and not jointly, to purchase from the Company, at a purchase price of \$14.57 per share, the respective number of Firm Securities set forth opposite the names of the Underwriters in Schedule A hereto.

The Company will deliver the Firm Securities to or as instructed by the Representatives for the accounts of the several Underwriters in a form reasonably acceptable to the Representatives against payment of the purchase price by the Underwriters in Federal (same day) funds by wire transfer to an account at a bank reasonably acceptable to the Representative drawn to the order of the Company at the office of Cooley LLP, 500 Boylston Street, 14th Floor, Boston, Massachusetts 02116-3736, at 9:00 A.M., Eastern time, on December 14, 2018, or at such other time not later than seven full business days thereafter as the Representatives and the Company determine, such time being herein referred to as the "**First Closing Date**". For purposes of Rule 15c6-1 under the Exchange Act, the First Closing Date (if later than the otherwise applicable settlement date) shall be the settlement date for payment of funds and delivery of securities for all Offered Securities sold pursuant to the offering. The Firm Securities so to be delivered or evidence of their issuance will be made available for checking at the above office of Cooley LLP at least 24 hours prior to the First Closing Date.

In addition, upon written notice from the Representatives given to the Company from time to time not more than 30 days subsequent to the date of the Final Prospectus, the Underwriters may purchase all or less than all of the Optional Securities at the purchase price per share to be paid for the Firm Securities. The Company agrees to sell to the Underwriters the number of Optional Securities specified in such notice and the Underwriters agree, severally and not jointly, to purchase such Optional Securities. Such Optional Securities shall be purchased from the Company for the account of each Underwriter in the same proportion as the number of Firm Securities set forth opposite such Underwriter's name bears to the total number of Firm Securities (subject to adjustment by the Representatives to eliminate fractions) and may be purchased by the Underwriters only for the purpose of covering over-allotments made in connection with the sale of the Firm Securities. No Optional Securities shall be sold or delivered unless the Firm Securities previously have been, or simultaneously are, sold and delivered. Subject to the satisfaction or waiver of the notice provision of the first sentence of this paragraph, the right to purchase the Optional Securities or any portion thereof may be exercised from time to time and to the extent not previously exercised may be surrendered and terminated at any time upon notice by the Representatives to the Company.

Each time for the delivery of and payment for the Optional Securities, being herein referred to as an “**Optional Closing Date**”, which may be the First Closing Date (the First Closing Date and each Optional Closing Date, if any, being sometimes referred to as a “**Closing Date**”), shall be determined by the Representatives but shall be not later than five full business days after written notice of election to purchase Optional Securities is given. The Company will deliver the Optional Securities being purchased by the Underwriters on each Optional Closing Date to or as instructed by the Representatives for the accounts of the several Underwriters in a form reasonably acceptable to the Representatives against payment of the purchase price therefor in Federal (same day) funds by wire transfer to an account at a bank reasonably acceptable to the Representatives drawn to the order of the Company, at the above office of Cooley LLP. The Optional Securities being purchased on each Optional Closing Date or evidence of their issuance will be made available for checking at the above office of Cooley LLP at a reasonable time in advance of such Optional Closing Date.

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

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

(a) *Filing of Prospectuses.* The Company has filed or will file each Statutory Prospectus (including the Final Prospectus) pursuant to and in accordance with Rule 424(b)(2) (or, if applicable and consented to by the Representatives, subparagraph (5)) not later than 5:30 pm (Eastern time) on the business day immediately preceding the First Closing Date. The Company has complied and will comply with Rule 433.

(b) *Filing of Amendments; Response to Commission Requests.* The Company will promptly advise the Representatives of any proposal to amend or supplement the Registration Statement or any Statutory Prospectus at any time prior to the completion of the distribution of the Offered Securities within the meaning of the Act and will not effect such amendment or supplement without the Representatives’ consent (which consent shall not be unreasonably withheld, conditioned or delayed); and the Company will also advise the Representatives promptly of (i) the effectiveness of any Additional Registration Statement (if its Effective Time is subsequent to the execution and delivery of this Agreement), (ii) any amendment or supplementation of a Registration Statement or any Statutory Prospectus, (iii) any request by the Commission or its staff for any amendment to any Registration Statement, for any supplement to any Statutory Prospectus or for any additional information, (iv) the institution by the Commission of any stop order proceedings in respect of a Registration Statement or the threatening of any proceeding for that purpose, and (v) the receipt by the Company of any notification with respect to the suspension of the qualification of the Offered Securities in any jurisdiction or the institution or

threatening of any proceedings for such purpose. The Company will use its reasonable best efforts to prevent the issuance of any such stop order or the suspension of any such qualification and, if issued, to obtain as soon as possible the withdrawal thereof.

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

(d) *Testing-the-Waters Communication.* If at any time following the distribution of any Testing-the-Waters Communication there occurred or occurs an event or development as a result of which such Testing-the-Waters Communication included or would include an untrue statement of a material fact or omitted or would omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances existing at that subsequent time, not misleading, the Company will promptly notify the Representatives and will promptly amend or supplement, at its own expense, such Testing-the-Waters Communication to eliminate or correct such statement or omission.

(e) *Rule 158.* As soon as practicable, but not later than 16 months after the date of this Agreement, the Company will make generally available to its security holders an earnings statement covering a period of at least 12 months beginning after the date of this Agreement and satisfying the provisions of Section 11(a) of the Act and Rule 158 under the Act.

(f) *Furnishing of Prospectuses.* The Company will furnish to the Representatives copies of each Registration Statement (of which one will include all exhibits), each related Statutory Prospectus, and, so long as a prospectus relating to the Offered Securities is (or but for the exemption in Rule 172 would be) required to be delivered under the Act, the Final Prospectus and all amendments and supplements to such documents, in each case in such quantities as the Representatives reasonably request. The Final Prospectus shall be so furnished on

the date it was filed with the Commission pursuant to Section 5(a) hereof. All other documents shall be so furnished as soon as available. The Company will pay the expenses of printing and distributing to the Underwriters all such documents.

(g) *Blue Sky Qualifications.* The Company will arrange for the qualification of the Offered Securities for sale under the laws of such jurisdictions as the Representatives designate and will continue such qualifications in effect so long as required for the distribution; provided, however, that the Company shall not be required to qualify or register as a foreign corporation in any jurisdiction in which it is not so qualified, file a general consent to service of process in any such jurisdiction or take any action that would subject it to taxation in any such jurisdiction where it is not then so subject.

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

(i) *Payment of Expenses.* The Company will pay all expenses incident to the performance of its obligations under this Agreement, including but not limited to any filing fees and other documented expenses (including reasonable fees and disbursements of counsel to the Underwriters), incurred in connection with qualification of the Offered Securities for sale under the laws of such jurisdictions as the Representatives designate and the preparation and printing of memoranda relating thereto (in an amount not to exceed \$10,000 in the aggregate), documented costs and expenses related to the review by the Financial Industry Regulatory Authority, Inc. (“**FINRA**”) of the Offered Securities including filing fees (and also including the reasonable fees and expenses of counsel for the Underwriters relating to such review in an amount not to exceed \$35,000 in the aggregate), costs and expenses relating to investor presentations or any “road show” in connection with the offering and sale of the Offered Securities including, without limitation, any travel expenses of the Company’s officers and employees and any other expenses of the Company, including the cost of transportation in connection with the road show; provided, that 50% of the cost of any aircraft chartered in connection with the road show shall be the responsibility of the Underwriters (it being understood that the other 50% shall be the responsibility of the Company), fees and expenses incident to

listing the Offered Securities on the Nasdaq Stock Market and other national and foreign exchanges, fees and expenses in connection with the registration of the Offered Securities under the Exchange Act, and expenses incurred in distributing preliminary prospectuses and the Final Prospectus (including any amendments and supplements thereto) to the Underwriters and for expenses incurred for preparing, printing and distributing any Issuer Free Writing Prospectuses to investors or prospective investors. Except as provided in this Section 5(i) and in Section 10, the Underwriters shall pay their own costs and expenses, including the costs and expenses of their counsel.

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

(k) *Absence of Manipulation.* The Company will not take, directly or indirectly, any action designed to or that would constitute or that might reasonably be expected to cause or result in, stabilization or manipulation of the price of any securities of the Company to facilitate the sale or resale of the Offered Securities.

(l) *Restriction on Sale of Securities.* For the period specified below (the “**Lock-Up Period**”), the Company will not, directly or indirectly, take any of the following actions with respect to its Securities or any securities convertible into or exchangeable or exercisable for any of its Securities (“**Lock-Up Securities**”): (i) offer, sell, issue, contract to sell, pledge or otherwise dispose of Lock-Up Securities, (ii) offer, sell, issue, contract to sell, contract to purchase or grant any option, right or warrant to purchase Lock-Up Securities, (iii) enter into any swap, hedge or any other agreement that transfers, in whole or in part, the economic consequences of ownership of Lock-Up Securities, (iv) establish or increase a put equivalent position or liquidate or decrease a call equivalent position in Lock-Up Securities within the meaning of Section 16 of the Exchange Act or (v) file with the Commission a registration statement under the Act relating to Lock-Up Securities, or publicly disclose the intention to take any such action, without the prior written consent of the Representatives, except the Company may (a) grant stock options, restricted shares of common stock or other equity grants to employees or eligible consultants, in each case pursuant to the terms of the Company’s equity incentive plans existing as of the First Closing Date and disclosed in the General Disclosure Package and Final Prospectus, (b) issue Lock-Up Securities pursuant to the exercise of such options or equity grants, or the exercise (including net exercise) of warrants to purchase Securities or the conversion of other convertible securities outstanding on the First Closing Date and described in the General Disclosure Package and the Final Prospectus, (c) issue Lock-Up Securities upon the exercise of any other

employee or consultant stock options outstanding on the First Closing Date and described in the General Disclosure Package and Final Prospectus, (d) sell Lock-Up Securities pursuant to this Agreement, (e) file one or more registration statements on Form S-8 relating to the Lock-Up Securities granted pursuant to the Company's equity incentive plans existing as of the First Closing Date and disclosed in the General Disclosure Package and the Final Prospectus, and (f) issue Lock-Up Securities or any securities convertible into, or exercisable, or exchangeable for, Lock-Up Securities in connection with any acquisition or strategic investment (including any joint venture, strategic alliance or partnership); provided that in the case of clause (f) such issuances, sales or deliveries shall not be greater than 5% of the total outstanding shares of common stock of the Company immediately following the completion of this offering of Offered Securities and, in the cases of clauses (b), (c), and (f), the recipients of such Lock-Up Securities agree to be bound by a lockup letter in the form executed by the officers of the Company pursuant to Section 7(h) hereof. The Lock-Up Period will commence on the date hereof and continue for 90 days after the date hereof or such earlier date that the Representatives consent to in writing.

(m) *Loss of Emerging Growth Company Status.* The Company will promptly notify the Representatives if the Company ceases to be an Emerging Growth Company at any time prior to the later of (A) completion of the distribution of the Offered Securities within the meaning of the Act and (B) completion of the Lock-up Period.

6. *Free Writing Prospectuses.* The Company represents and agrees that, unless it obtains the prior consent of the Representatives, and each Underwriter represents and agrees that, unless it obtains the prior consent of the Company and the Representatives, it has not made and will not make any offer relating to the Offered Securities that would constitute an Issuer Free Writing Prospectus, or that would otherwise constitute a "free writing prospectus," as defined in Rule 405, required to be filed with the Commission. Any such free writing prospectus consented to by the Company and the Representatives is hereinafter referred to as a "**Permitted Free Writing Prospectus**." The Company represents that it has treated and agrees that it will treat each Permitted Free Writing Prospectus as an "issuer free writing prospectus," as defined in Rule 433, and has complied and will comply with the requirements of Rules 164 and 433 applicable to any Permitted Free Writing Prospectus, including timely Commission filing where required, legending and record keeping. The Company represents that it has satisfied and agrees that it will satisfy the conditions in Rule 433 to avoid a requirement to file with the Commission any electronic road show.

7. *Conditions of the Obligations of the Underwriters.* The obligations of the several Underwriters to purchase and pay for the Firm Securities on the First Closing Date and the Optional Securities to be purchased on each Optional Closing Date will be subject to the accuracy of the representations and warranties of the Company herein (as though made on such Closing Date), to the accuracy of the statements of Company officers made

pursuant to the provisions hereof, to the performance by the Company of its obligations hereunder and to the following additional conditions precedent:

(a) *Accountants' Comfort Letter.* The Representatives shall have received letters, dated, respectively, the date hereof and each Closing Date, of Deloitte & Touche LLP confirming that they are a registered public accounting firm and independent public accountants within the meaning of the Securities Laws and in form and substance satisfactory to the Representatives (except that, in any letter dated a Closing Date, the specified date referred to in such letter shall be a date no more than three days prior to such Closing Date).

(b) *Filing of Prospectus.* The Final Prospectus shall have been filed with the Commission in accordance with the Rules and Regulations and Section 5 hereof. Prior to such Closing Date, no stop order suspending the effectiveness of a Registration Statement shall have been issued and no proceedings for that purpose shall have been instituted or, to the knowledge of the Company or the Representatives, shall be threatened by the Commission.

(c) *No Material Adverse Change.* Subsequent to the execution and delivery of this Agreement, there shall not have occurred (i) any change, or any development or event involving a prospective change, in the condition (financial or otherwise), results of operations, business, properties or prospects of the Company and its subsidiaries taken as a whole which, in the judgment of the Representatives, is material and adverse and makes it impractical or inadvisable to market the Offered Securities; (ii) any downgrading in the rating of any debt securities of the Company by any "nationally recognized statistical rating organization" (as defined in Section 3(a)(62) of the Exchange Act), or any public announcement that any such organization has under surveillance or review its rating of any debt securities of the Company (other than an announcement with positive implications of a possible upgrading, and no implication of a possible downgrading, of such rating); (iii) any change in U.S. or international financial, political or economic conditions or currency exchange rates or exchange controls the effect of which is such as to make it, in the judgment of the Representatives, impractical to market or to enforce contracts for the sale of the Offered Securities, whether in the primary market or in respect of dealings in the secondary market; (iv) any suspension or material limitation of trading in securities generally on the New York Stock Exchange or the Nasdaq Stock Market, or any setting of minimum or maximum prices for trading on such exchange; (v) any suspension of trading of any securities of the Company on any exchange or in the over-the-counter market; (vi) any banking moratorium declared by any U.S. federal or New York authorities; (vii) any major disruption of settlements of securities, payment, or clearance services in the United States or any other country where such securities are listed or (viii) any attack on, outbreak or escalation of hostilities or act of terrorism involving the United States, any declaration of war by Congress or any other national or international calamity or emergency if, in the judgment of the Representatives, the effect of any such attack,

outbreak, escalation, act, declaration, calamity or emergency is such as to make it impractical or inadvisable to market the Offered Securities or to enforce contracts for the sale of the Offered Securities.

(d) *Opinion of Counsel for Company.* The Representatives shall have received an opinion and negative assurance letter, dated such Closing Date, of Latham & Watkins LLP, counsel for the Company, in form and substance reasonably satisfactory to the Representatives.

(e) *Opinion of IP Counsel for Company.* The Representatives shall have received an opinion, dated such Closing Date, of DTWard PC, special intellectual property counsel for the Company, in form and substance reasonably satisfactory to the Representatives.

(f) *Opinion of Counsel for Underwriters.* The Representatives shall have received from Cooley LLP, counsel for the Underwriters, such opinion or opinions, dated such Closing Date, with respect to such matters as the Representatives may require, and the Company shall have furnished to such counsel such documents as they request for the purpose of enabling them to pass upon such matters.

(g) *Officers' Certificate.* The Representatives shall have received a certificate, dated such Closing Date, of an executive officer of the Company and a principal financial or accounting officer of the Company in which such officers shall state that: the representations and warranties of the Company in this Agreement are true and correct; the Company has complied with all agreements and satisfied all conditions on its part to be performed or satisfied hereunder at or prior to such Closing Date; no stop order suspending the effectiveness of any Registration Statement has been issued and no proceedings for that purpose have been instituted or, to the best of their knowledge, are threatened by the Commission; the Additional Registration Statement (if any) satisfying the requirements of subparagraphs (1) and (3) of Rule 462(b) was timely filed pursuant to Rule 462(b), including payment of the applicable filing fee in accordance with Rule 111(a) or (b) of Regulation S-T of the Commission; and, subsequent to the dates of the most recent financial statements in the General Disclosure Package and the Final Prospectus, there has been no material adverse change, nor any development or event involving a prospective material adverse change, in the condition (financial or otherwise), results of operations, business, properties or prospects of the Company and its subsidiaries taken as a whole except as set forth in the General Disclosure Package and the Final Prospectus or as described in such certificate.

(h) *Lock-up Agreements.* On or prior to the date hereof, the Representatives shall have received lockup letters, in the form attached hereto as Exhibit A, from each executive officer, director, optionholder and the other equityholders of the Company specified in Schedule C to this Agreement.

(i) *Approval of Listing.* On or prior to such Closing Date, the Offered Securities shall have been approved for listing on the Nasdaq Stock Market.

(j) *No Objection.* FINRA has confirmed that it has not raised any objection with respect to the fairness and reasonableness of the underwriting terms and arrangements.

The Company will furnish the Representatives with such conformed copies of such opinions, certificates, letters and documents as the Representatives reasonably request. The Representatives may in their sole discretion waive on behalf of the Underwriters compliance with any conditions to the obligations of the Underwriters hereunder, whether in respect of an Optional Closing Date or otherwise.

8. *Indemnification and Contribution.*

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

(b) *Indemnification of Company.* Each Underwriter will severally and not jointly indemnify and hold harmless the Company, each of its directors and each of its officers who signs a Registration Statement and each person, if any, who controls the Company within the meaning of Section 15 of the Act or Section 20 of the Exchange Act (each, an “**Underwriter Indemnified Party**”), against any losses, claims, damages or liabilities to which such Underwriter Indemnified Party may become subject, under the Act, the Exchange Act, other Federal or state statutory law or regulation or otherwise, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon any untrue statement or alleged untrue statement of any material fact contained in any part of any Registration Statement at any time, any Statutory Prospectus as of any time, the Final Prospectus, any Issuer Free Writing Prospectus or any Testing-the-Waters Writing, or arise out of or are based upon the omission or the alleged omission of a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances in which they were made, not misleading, in each case to the extent, but only to the extent, that such untrue statement or alleged untrue statement or omission or alleged omission was made in reliance upon and in conformity with written information furnished to the Company by such Underwriter through the Representatives specifically for use therein, and will reimburse any legal or other expenses reasonably incurred by such Underwriter Indemnified Party in connection with investigating or defending against any such loss, claim, damage, liability, action, litigation, investigation or proceeding whatsoever (whether or not such Underwriter Indemnified Party is a party thereto), whether threatened or commenced, based upon any such untrue statement or omission, or any such alleged untrue statement or omission as such expenses are incurred, it being understood and agreed that the only such information furnished by any Underwriter consists of the following information in the Final Prospectus furnished on behalf of each Underwriter: the information contained in (i) the first two sentences of the third paragraph under the caption “Underwriting,” (ii) the first two sentences of the first paragraph under the caption “Underwriting—Commissions and Expenses,” and (iii) the first sentence of the first paragraph, the second and third sentences of the second paragraph and the second and third sentences of the third paragraph under the caption “Underwriting—Stabilization.”

(c) *Actions against Parties; Notification.* Promptly after receipt by an indemnified party under this Section of notice of the commencement of any action, such indemnified party will, if a claim in respect thereof is to be made against the indemnifying party under subsection (a) or (b) above, notify the indemnifying party of the commencement thereof; but the failure to notify the indemnifying party shall not relieve it from any liability that it may have under subsection (a) or (b) above except to the extent that it has been materially prejudiced (through the forfeiture of substantive rights or defenses) by such failure; and provided further that the failure to notify the indemnifying party shall not relieve it from any liability that it may have to an indemnified party otherwise than under subsection (a) or (b) above. In case any such action is brought against any indemnified party and it notifies the

indemnifying party of the commencement thereof, the indemnifying party will be entitled to participate therein and, to the extent that it may wish, jointly with any other indemnifying party similarly notified, to assume the defense thereof, with counsel satisfactory to such indemnified party (who shall not, except with the consent of the indemnified party be counsel to the indemnifying party), and after notice from the indemnifying party to such indemnified party of its election so to assume the defense thereof, the indemnifying party will not be liable to such indemnified party under this Section for any legal or other expenses subsequently incurred by such indemnified party in connection with the defense thereof other than reasonable costs of investigation. No indemnifying party shall, without the prior written consent of the indemnified party effect any settlement of any pending or threatened action in respect of which any indemnified party is or could have been a party and indemnity could have been sought hereunder by such indemnified party unless such settlement (i) includes an unconditional release of such indemnified party from all liability on any claims that are the subject matter of such action and (ii) does not include a statement as to, or an admission of, fault, culpability or a failure to act by or on behalf of an indemnified party.

(d) *Contribution.* If the indemnification provided for in this Section is unavailable or insufficient to hold harmless an indemnified party under subsection (a) or (b) above, then each indemnifying party shall contribute to the amount paid or payable by such indemnified party as a result of the losses, claims, damages or liabilities referred to in subsection (a) or (b) above (i) in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and the Underwriters on the other from the offering of the Securities or (ii) if the allocation provided by clause (i) above is not permitted by applicable law, in such proportion as is appropriate to reflect not only the relative benefits referred to in clause (i) above but also the relative fault of the Company on the one hand and the Underwriters on the other in connection with the statements or omissions which resulted in such losses, claims, damages or liabilities as well as any other relevant equitable considerations. The relative benefits received by the Company on the one hand and the Underwriters on the other shall be deemed to be in the same proportion as the total net proceeds from the offering (before deducting expenses) received by the Company bear to the total underwriting discounts and commissions received by the Underwriters. The relative fault shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the Company or the Underwriters and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such untrue statement or omission. The amount paid by an indemnified party as a result of the losses, claims, damages or liabilities referred to in the first sentence of this subsection (d) shall be deemed to include any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any action or claim which is the subject of this subsection (d). Notwithstanding the provisions of this subsection (d), no Underwriter shall be required to contribute any amount in excess

of the amount by which the total price at which the Securities underwritten by it and distributed to the public were offered to the public exceeds the amount of any damages which such Underwriter has otherwise been required to pay by reason of such untrue or alleged untrue statement or omission or alleged omission. No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. The Underwriters' obligations in this subsection (d) to contribute are several in proportion to their respective underwriting obligations and not joint. The Company and the Underwriters agree that it would not be just and equitable if contribution pursuant to this Section 8(d) were determined by pro rata allocation (even if the Underwriters were treated as one entity for such purpose) or by any other method of allocation which does not take account of the equitable considerations referred to in this Section 8(d).

9. *Default of Underwriters.* If any Underwriter or Underwriters default in their obligations to purchase Offered Securities hereunder on either the First Closing Date or any Optional Closing Date and the aggregate number of Offered Securities that such defaulting Underwriter or Underwriters agreed but failed to purchase does not exceed 10% of the total number of Offered Securities that the Underwriters are obligated to purchase on such Closing Date, the Representatives may make arrangements satisfactory to the Company for the purchase of such Offered Securities by other persons, including any of the Underwriters, but if no such arrangements are made by such Closing Date, the non-defaulting Underwriters shall be obligated severally, in proportion to their respective commitments hereunder, to purchase the Offered Securities that such defaulting Underwriters agreed but failed to purchase on such Closing Date. If any Underwriter or Underwriters so default and the aggregate number of Offered Securities with respect to which such default or defaults occur exceeds 10% of the total number of Offered Securities that the Underwriters are obligated to purchase on such Closing Date and arrangements satisfactory to the Representatives and the Company for the purchase of such Offered Securities by other persons are not made within 48 hours after such default, this Agreement will terminate without liability on the part of any non-defaulting Underwriter or the Company, except as provided in Section 10 (provided that if such default occurs with respect to Optional Securities after the First Closing Date, this Agreement will not terminate as to the Firm Securities or any Optional Securities purchased prior to such termination). As used in this Agreement, the term "Underwriter" includes any person substituted for an Underwriter under this Section. Nothing herein will relieve a defaulting Underwriter from liability for its default.

10. *Survival of Certain Representations and Obligations.* The respective indemnities, agreements, representations, warranties and other statements of the Company or its officers and of the several Underwriters set forth in or made pursuant to this Agreement will remain in full force and effect, regardless of any investigation, or statement as to the results thereof, made by or on behalf of any Underwriter, the Company or any of their respective representatives, officers or directors or any controlling person, and will survive delivery of and payment for the Offered Securities. If the purchase of the Offered

Securities by the Underwriters is not consummated for any reason other than any of the events specified in clauses (iii), (iv), (vi), (vii) or (viii) of Section 7(c), or because of the termination of this Agreement pursuant to Section 9 hereof, the Company will reimburse the Underwriters for all out-of-pocket expenses (including fees and disbursements of counsel) reasonably incurred by them in connection with the offering of the Offered Securities, and the respective obligations of the Company and the Underwriters pursuant to Section 8 hereof shall remain in effect. In addition, if any Offered Securities have been purchased hereunder, the representations and warranties in Section 2 and all obligations under Section 5 shall also remain in effect.

11. *Notices.* All communications hereunder will be in writing and, if sent to the Underwriters, will be mailed, delivered or telegraphed and confirmed to the Representatives, c/o Jefferies LLC, 520 Madison Avenue, New York, New York 10022, Attention: General Counsel, c/o BMO Capital Markets Corp., 3 Times Square, New York, New York 10036, Attention: Legal Department, and c/o Stifel, Nicolaus & Company, Incorporated, 787 7th Avenue, 11th Floor, New York, New York 10019, Attention: Syndicate Department, or, if sent to the Company, will be mailed, delivered or telegraphed and confirmed to it at 87 Cambridge Park Drive, Cambridge, MA 02140, Attention: Chief Financial Officer; with a copy to Latham & Watkins LLP, 200 Clarendon Street, 27th Floor, Boston, MA 02116, Attention: Peter N. Handrinos, provided, however, that any notice to an Underwriter pursuant to Section 8 will be mailed, delivered or telegraphed and confirmed to such Underwriter.

12. *Successors.* This Agreement will inure to the benefit of and be binding upon the parties hereto and their respective successors and the officers and directors and controlling persons referred to in Section 8, and no other person will have any right or obligation hereunder.

13. *Representation of Underwriters.* The Representatives will act for the several Underwriters in connection with the transactions contemplated by this Agreement, and any action under this Agreement taken by the Representatives will be binding upon all the Underwriters.

14. *Counterparts.* This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, but all such counterparts shall together constitute one and the same Agreement.

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

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

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

(c) *Absence of Obligation to Disclose.* The Company has been advised that the Representatives and their affiliates are engaged in a broad range of transactions which may involve interests that differ from those of the Company and that the Representatives have no obligation to disclose such interests and transactions to the Company by virtue of any fiduciary, advisory or agency relationship; and

(d) *Waiver.* The Company waives, to the fullest extent permitted by law, any claims it may have against the Representatives for breach of fiduciary duty or alleged breach of fiduciary duty and agrees that the Representatives shall have no liability (whether direct or indirect) to the Company in respect of such a fiduciary duty claim or to any person asserting a fiduciary duty claim on behalf of or in right of the Company, including stockholders, employees or creditors of the Company.

16. *Applicable Law.* This Agreement shall be governed by, and construed in accordance with, the laws of the State of New York.

The Company hereby submits to the non-exclusive jurisdiction of the Federal and state courts in the Borough of Manhattan in The City of New York in any suit or proceeding arising out of or relating to this Agreement or the transactions contemplated hereby. The Company irrevocably and unconditionally waives any objection to the laying of venue of any suit or proceeding arising out of or relating to this Agreement or the transactions contemplated hereby in Federal and state courts in the Borough of Manhattan in The City of New York and irrevocably and unconditionally waives and agrees not to plead or claim in any such court that any such suit or proceeding in any such court has been brought in an inconvenient forum.

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

[Signature Page Follows]

If the foregoing is in accordance with the Representatives' understanding of our agreement, kindly sign and return to the Company one of the counterparts hereof, whereupon it will become a binding agreement between the Company and the several Underwriters in accordance with its terms.

Very truly yours,

RA PHARMACEUTICALS, INC.

By: /s/ Douglas A. Treco, Ph.D.

Name: Douglas A. Treco, Ph.D.

Title: President and Chief Executive Officer

The foregoing Underwriting Agreement is hereby confirmed and accepted as of the date first above written.

JEFFERIES LLC

By: /s/ Matthew Kim

Name: Matthew Kim

Title: Managing Director

BMO CAPITAL MARKETS CORP.

By: /s/ Mihir Mantri

Name: Mihir Mantri

Title: Managing Director

STIFEL, NICOLAUS & COMPANY, INCORPORATED

By: /s/ Keith Lister

Name: Keith Lister

Title: Managing Director

Acting on behalf of themselves and as the Representatives of the several Underwriters

SCHEDULE A

Underwriter	Number of Firm Securities
Jefferies LLC	2,935,484
BMO Capital Markets Corp.	2,306,452
Stifel, Nicolaus & Company, Incorporated	2,096,774
Guggenheim Securities, LLC	838,710
Raymond James & Associates, Inc.	209,677
Total	<u>8,387,097</u>

SCHEDULE B

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

“General Use Issuer Free Writing Prospectus” includes each of the following documents:

None.

2. Other Information Included in the General Disclosure Package

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

1. The initial price per share to the public of the Offered Securities: \$15.50
 2. Number of Firm Securities: 8,387,097
 3. Number of Optional Securities 1,258,064
 4. Underwriting Discounts and Commissions: 6%
-

SCHEDULE C

Persons Signing Lock-Up Agreements

Peter Tuxen Bisgaard
Robert Heft, Ph.D.
Edward T. Mathers
Timothy R. Pearson
Rajeev Shah
Aoife M. Brennan
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Simon Read, Ph.D.
John C. King
Ramin Farzaneh-Far, M.D.
New Enterprise Associates 13, L.P.
RA Capital Management, LLC
Blackwell Partners, LLC

EXHIBIT A

Form of Lock-up Agreement

Ra Pharmaceuticals, Inc.
87 Cambridge Park Dr.
Cambridge, MA 02140

Jefferies LLC
BMO Capital Markets Corp.
Stifel, Nicolaus & Company, Incorporated
As Representatives of the Several Underwriters,

c/o Jefferies LLC
520 Madison Avenue
New York, N.Y. 10022

c/o BMO Capital Markets Corp.
3 Times Square, 25th Floor
New York, N.Y. 10036

c/o Stifel, Nicolaus & Company, Incorporated
787 7th Avenue, 11th Floor
New York, N.Y. 10019

Dear Sir or Madam:

As an inducement to the Underwriters to execute the Underwriting Agreement (the "**Underwriting Agreement**"), pursuant to which an offering will be made of shares of common stock, \$0.001 par value per share (the "**Securities**") of Ra Pharmaceuticals, Inc., a Delaware corporation, and any successor (by merger or otherwise) thereto, (the "**Company**"), the undersigned hereby agrees that during the period specified in the following paragraph (the "**Lock-Up Period**"), the undersigned will not offer, sell, contract to sell, pledge or otherwise dispose of, directly or indirectly, any Securities or securities convertible into or exchangeable or exercisable for any Securities, enter into a transaction which would have the same effect, or enter into any swap, hedge or other arrangement that transfers, in whole or in part, any of the economic consequences of ownership of the Securities, whether any such aforementioned transaction is to be settled by delivery of the Securities or such other securities, in cash or otherwise, or publicly disclose the intention to make any such offer, sale, pledge or disposition, or to enter into any such transaction, swap, hedge or other arrangement, without, in each case, the prior written consent of Jefferies LLC, BMO Capital Markets Corp. and Stifel, Nicolaus & Company, Incorporated, as representatives of the several Underwriters (collectively, the "**Representatives**"). In addition, the undersigned agrees that, without the prior written consent of the Representatives, it will not, during the Lock-Up Period, make any demand for or exercise any right with respect to, the registration of any Securities or any security convertible into or exercisable or exchangeable for the Securities.

The initial Lock-Up Period will commence on the date of this Lock-Up Agreement and include the date that is 90 days after the public offering date set forth on the final prospectus used to sell the Securities (the “**Public Offering Date**”) pursuant to the Underwriting Agreement, to which you are or expect to become parties.

Any Securities received upon exercise of options or warrants granted to the undersigned will also be subject to this Lock-Up Agreement.

Notwithstanding anything herein to the contrary, the restrictions contained in this letter agreement (this “**Lock-Up Agreement**”) shall not apply to any of the following: (i) transfers of Securities as a bona fide gift or gifts or for bona fide estate planning purposes; (ii) transfers of Securities or other securities of the Company to a trust or limited family partnership for the direct or indirect benefit of the undersigned or the immediate family of the undersigned (for purposes of this Lock-Up Agreement, “immediate family” shall mean any relationship by blood, current or former marriage or adoption, not more remote than first cousin); (iii) transfers of Securities or other securities of the Company by will, other testamentary document or intestate succession in a transaction not involving a disposition for value; (iv) transfers of Securities or other securities of the Company pursuant to a court order in respect of, or by operation of law as a result of, a divorce, in a transaction not involving a disposition for value; (v) the transfer of Securities to the Company in connection with the exercise, including by and to the extent necessary to cover any “net” exercise, of any options or warrants to acquire Securities or the conversion of any convertible security into Securities in accordance with its terms, provided that any Securities issued to the undersigned upon such exercise or conversion shall be subject to the restrictions set forth herein and no filing or public announcement by any party under the Securities Exchange Act of 1934 (the “**Exchange Act**”) or otherwise shall be required or shall be voluntarily made in connection with such transfer, exercise, or conversion (other than a filing on a Form 5 made after the expiration of the Lock-Up Period or, in the case of a “net” exercise, a filing on a Form 4 that reports such “net” exercise under the transaction code “F”); (vi) transfers of Securities or other securities of the Company to a limited liability company or partnership wholly-owned and controlled by the undersigned, provided that the transfer shall not involve a disposition for value; (vii) if the undersigned is a trust, transfers of Securities or other securities of the Company to any beneficiary of the undersigned or the estate of any such beneficiary, provided that the transfer shall not involve a disposition for value; (viii) transfers or distributions of Securities to members, limited partners, stockholders or affiliates of, or any investment fund or other entity that controls or manages, the undersigned, provided that the transfer or distribution shall not involve a disposition for value; (ix) transfers or distributions in connection with a merger or sale of all or substantially all of the voting securities or assets of the Company, regardless of how such a transaction is structured (it being further understood that this agreement shall not restrict the undersigned from entering into any agreement or arrangement in connection therewith, including an agreement to vote in favor of, or tender Securities or other securities of the Company in, any such transaction or taking any other action in connection with any such transaction), provided that the restrictions set forth herein shall continue to apply should the completion of the transaction not occur; (x) the entering into by the undersigned of a written trading plan pursuant to Rule 10b5-1 of the Exchange Act during the Lock-Up Period, provided that no sales of the undersigned’s Securities shall be made pursuant to such plan, and no public disclosures shall be

made regarding such plan, prior to the expiration of the Lock-Up Period; or (xi) Securities purchased by the undersigned in the open market or in the offering to which the Underwriting Agreement relates, including any issuer directed share program, provided that no filing or public announcement by any party under Section 16 of the Exchange Act shall be required or shall be voluntarily made in connection with such transfer (other than a filing on a Form 5 made after the expiration of the Lock-Up Period); provided further that, with respect to clauses (i), (ii), (iii), (iv), (vi), (vii) and (viii), (a) each transferee or distributee agrees to be bound in writing by the terms of this Lock-Up Agreement prior to such transfer, and (b) no filing or public announcement by any party under the Exchange Act or otherwise shall be required or shall be voluntarily made in connection with such transfer, exercise, conversion or distribution (other than a filing on a Form 5 made after the expiration of the Lock-Up Period).

In furtherance of the foregoing, the Company and its transfer agent and registrar are hereby authorized to decline to make any transfer of shares of Securities if such transfer would constitute a violation or breach of this Lock-Up Agreement.

If the undersigned is an officer or director of the Company, the undersigned further agrees that the foregoing restrictions in this Lock-Up Agreement shall be equally applicable to any issuer-directed Securities the undersigned may purchase in the above-referenced offering.

This Lock-Up Agreement shall be binding on the undersigned and the successors, heirs, personal representatives and assigns of the undersigned. This Lock-Up Agreement shall lapse and become null and void upon the earliest to occur, if any, of (i) if the Public Offering Date shall not have occurred on or before February 14, 2019, (ii) the date on which the Underwriting Agreement (other than the provisions thereof which survive termination) shall terminate or be terminated prior to payment for and delivery of the Securities to be sold thereunder, or (iii) upon written notice from an authorized officer of the Company to the Representatives, executed or delivered prior to the signing of the Underwriting Agreement, that the Company has determined not to proceed with the public offering of the Securities. **This agreement shall be governed by, and construed in accordance with, the laws of the State of New York.**

[Signature page follows]

Very truly yours,

Entity Name (if applicable): _____

By: _____

Name:

Title:

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December 14, 2018

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Ra Pharmaceuticals, Inc.
 87 Cambridge Park Drive
 Cambridge, MA 02140

Re: Registration Statement on Form S-3 (Registration No. 333-221266)

Ladies and Gentlemen:

We have acted as special counsel to Ra Pharmaceuticals, Inc., a Delaware corporation (the “*Company*”), in connection with the proposed issuance of 9,645,161 shares (the “*Shares*”) of common stock, \$0.001 par value per share (the “*Common Stock*”), pursuant to a registration statement on Form S-3 under the Securities Act of 1933, as amended (the “*Act*”), filed with the Securities and Exchange Commission (the “*Commission*”) on November 1, 2017 (Registration No. 333-221266), including the information deemed to be a part of the registration statement pursuant to Rule 430B of the Act (as so filed, the “*Registration Statement*”), a base prospectus dated November 14, 2017 (the “*Base Prospectus*”), a preliminary prospectus supplement dated December 10, 2018 filed with the Commission pursuant to Rule 424(b) under the Act (together with the Base Prospectus, the “*Preliminary Prospectus*”), and a prospectus supplement dated December 11, 2018 filed with the Commission pursuant to Rule 424(b) under the Act (together with Base Prospectus, the “*Prospectus*”). The Shares are being sold pursuant to an underwriting agreement dated December 11, 2018, by and between Jefferies LLC, BMO Capital Markets Corp. and Stifel, Nicolaus & Company, Incorporated, as representative of the several underwriters listed on Schedule A thereto, and the Company (the “*Underwriting Agreement*”). This opinion is being furnished in connection with the requirements of Item 601(b)(5) of Regulation S-K under the Act, and no opinion is expressed herein as to any matter pertaining to the contents of the Registration Statement, the Preliminary Prospectus or the Prospectus, other than as expressly stated herein with respect to the issue of the Shares.

As such counsel, we have examined such matters of fact and questions of law as we have considered appropriate for purposes of this letter. With your consent, we have relied upon certificates and other assurances of officers of the Company and others as to factual matters without having independently verified such factual matters. We are opining herein as to the General Corporation Law of the State of Delaware, and we express no opinion with respect to any other laws.

LATHAM & WATKINS LLP

Subject to the foregoing and the other matters set forth herein, it is our opinion that, as of the date hereof, when the Shares shall have been duly registered on the books of the transfer agent and registrar therefor in the name or on behalf of the purchasers, and have been issued by the Company against payment therefor (not less than par value) in the circumstances contemplated by the Underwriting Agreement, the issue and sale of the Shares will have been duly authorized by all necessary corporate action of the Company, and the Shares will be validly issued, fully paid and nonassessable. In rendering the foregoing opinion, we have assumed that the Company will comply with all applicable notice requirements regarding uncertificated shares provided in the General Corporation Law of the State of Delaware.

This opinion is for your benefit in connection with the Registration Statement and may be relied upon by you and by persons entitled to rely upon it pursuant to the applicable provisions of the Act. We consent to your filing this opinion as an exhibit to the Company's Form 8-K dated December 14, 2018 and to the reference to our firm in the Prospectus under the heading "Legal Matters." In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ LATHAM & WATKINS LLP
