

**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): September 9, 2024

IONIS PHARMACEUTICALS, INC.

(Exact Name of Registrant as Specified in its Charter)

Delaware
(State or Other Jurisdiction
of Incorporation)

000-19125
(Commission
File No.)

33-0336973
(IRS Employer
Identification No.)

2855 Gazelle Court
Carlsbad, CA 92010
(Address of Principal Executive Offices and Zip Code)

Registrant's telephone number, including area code: (760) 931-9200

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))

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading symbol	Name of each exchange on which registered
Common Stock, \$.001 Par Value	"IONS"	The Nasdaq Stock Market LLC

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (Section 230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (Section 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 September 9, 2024, Ionis Pharmaceuticals, Inc. ("***Ionis***") entered into an underwriting agreement (the "***Underwriting Agreement***") with Morgan Stanley & Co. LLC and Goldman Sachs & Co. LLC as representatives of the several underwriters named therein (collectively, the "***Underwriters***"), relating to the public offering, issuance and sale (the "***Offering***") of 11,500,000 shares of its common stock, par value \$0.001 per share ("***Common Stock***"), at a price to the public of \$43.50 per share. Pursuant to the Underwriting Agreement, the Underwriters purchased the shares of Common Stock from Ionis at a price of \$42.6020 per share. Ionis also granted the Underwriters a 30-day option to purchase up to an additional 1,725,000 shares of Common Stock from Ionis at the public offering price, less the underwriting discounts and commissions.

The gross proceeds to Ionis from the Offering were approximately \$500.3 million, before deducting underwriting discounts and commissions and other estimated offering expenses payable by Ionis. The closing of the Offering occurred on September 11, 2024.

The Offering is being made pursuant to Ionis' effective registration statement on Form S-3 (Registration Statement No. 333-275741), as previously filed with the Securities and Exchange Commission, and a related prospectus and prospectus supplement.

The Underwriting Agreement contains customary representations, warranties and covenants by Ionis, customary conditions to closing, indemnification obligations of Ionis and the Underwriters, including for liabilities under the Securities Act of 1933, as amended, other obligations of the parties and termination provisions. The representations, warranties and covenants contained in the Underwriting Agreement were made only for purposes of such agreement and as of specific dates, were solely for the benefit of the parties to such agreement and may be subject to limitations agreed upon by such parties.

The Underwriting Agreement is filed as Exhibit 1.1 hereto. The foregoing description of the terms of the Underwriting Agreement does not purport to be complete and is qualified in its entirety by reference to such exhibit hereto. A copy of the opinion of Cooley LLP relating to the legality of the issuance and sale of the securities in the Offering is attached as Exhibit 5.1 hereto.

Item 9.01. Financial Statements and Exhibits.

(d) Exhibits.

Exhibit No.	Description
1.1*	Underwriting Agreement, dated September 9, 2024.
5.1	Opinion of Cooley LLP.
23.1	Consent of Cooley LLP (contained in Exhibit 5.1).
104	Cover Page Interactive Data File (embedded within the Inline XBRL document).

* Schedules have been omitted pursuant to Item 601(a)(5) of Regulation S-K. The registrant undertakes to furnish supplemental copies of any of the omitted schedules upon request by the SEC.

SIGNATURE

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

IONIS PHARMACEUTICALS, INC.

Dated: September 11, 2024

By: /s/ Patrick R. O'Neil

PATRICK R. O'NEIL

Executive Vice President, Chief Legal Officer and General Counsel

Ionis Pharmaceuticals, Inc.**11,500,000 shares of common stock,
par value \$0.001 per share**

Underwriting Agreement

September 9, 2024

Morgan Stanley & Co. LLC
Goldman Sachs & Co. LLCAs representatives of the several Underwriters
named in Schedule I hereto,c/o Morgan Stanley & Co. LLC
1585 Broadway
New York, New York 10036c/o Goldman Sachs & Co. LLC
200 West Street
New York, New York 10282

Ladies and Gentlemen:

Ionis Pharmaceuticals, Inc., a Delaware corporation (the “Company”), proposes, subject to the terms and conditions stated in this underwriting agreement (this “Agreement”), to issue and sell to the Underwriters named in Schedule I hereto (the “Underwriters”), for whom Morgan Stanley & Co. LLC and Goldman Sachs & Co. LLC are acting as representatives (the “Representatives”), an aggregate of 11,500,000 shares (the “Firm Securities”), and at the election of the Representatives, up to an aggregate of 1,725,000 additional shares (the “Optional Securities”) of the common stock of the Company, par value \$0.001 per share (“Stock”). The Firm Securities and the Optional Securities that the Representatives elect to purchase pursuant to Section 2 hereof are collectively referred to herein as the “Securities.” Unless otherwise specified, for purposes of this Agreement, a “subsidiary” of the Company will mean any entity the financial statements of which are consolidated with the financial statements of the Company in accordance with generally accepted accounting principles in the United States from time to time (“U.S. GAAP”).

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

(a) An “automatic shelf registration statement” as defined under Rule 405 under the Securities Act of 1933, as amended (the “Act”), on Form S-3 (File No. 333- 275741) in respect of the Securities has been filed with the Securities and Exchange Commission (the “Commission”) not earlier than three years prior to the date hereof; such

registration statement, and any post-effective amendment thereto, became effective on filing; and no stop order suspending the effectiveness of such registration statement or any part thereof has been issued and no proceeding for that purpose has been initiated or threatened by the Commission, and no notice of objection of the Commission to the use of such registration statement or any post-effective amendment thereto pursuant to Rule 401(g)(2) under the Act has been received by the Company (the base prospectus filed as part of such registration statement, in the form in which it has most recently been filed with the Commission on or prior to the date of this Agreement, is hereinafter called the “Basic Prospectus”; any preliminary prospectus (including any preliminary prospectus supplement) relating to the Securities filed with the Commission pursuant to Rule 424(b) under the Act is hereinafter called a “Preliminary Prospectus”; the various parts of such registration statement, including all exhibits thereto and including any prospectus supplement relating to the Securities that is filed with the Commission and deemed by virtue of Rule 430B to be part of such registration statement, each as amended at the time such part of the registration statement became effective, are hereinafter collectively called the “Registration Statement”; the Basic Prospectus, as amended and supplemented immediately prior to the Applicable Time (as defined in Section 1(c) hereof), is hereinafter called the “Pricing Prospectus”; the form of the final prospectus relating to the Securities filed with the Commission pursuant to Rule 424(b) under the Act in accordance with Section 5(a) hereof is hereinafter called the “Prospectus”; any reference herein to the Basic Prospectus, the Pricing Prospectus, any Preliminary Prospectus or the Prospectus shall be deemed to refer to and include the documents incorporated by reference therein pursuant to Item 12 of Form S-3 under the Act, as of the date of such prospectus; any reference to any amendment or supplement to the Basic Prospectus, any Preliminary Prospectus or the Prospectus shall be deemed to refer to and include any post-effective amendment to the Registration Statement, any prospectus supplement relating to the Securities filed with the Commission pursuant to Rule 424(b) under the Act and any documents filed under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and incorporated therein, in each case after the date of the Basic Prospectus, such Preliminary Prospectus, or the Prospectus, as the case may be; any reference to any amendment to the Registration Statement shall be deemed to refer to and include any annual report of the Company filed pursuant to Section 13(a) or 15(d) of the Exchange Act after the effective date of the Registration Statement that is incorporated by reference in the Registration Statement; and any “issuer free writing prospectus” as defined in Rule 433 under the Act relating to the Securities is hereinafter called an “Issuer Free Writing Prospectus”);

(b) (A) No order preventing or suspending the use of any Preliminary Prospectus or any Issuer Free Writing Prospectus has been issued by the Commission, and (B) each Preliminary Prospectus, at the time of filing thereof, conformed in all material respects to the requirements of the Act and the rules and regulations of the Commission thereunder, and did not contain an untrue statement of a material fact or omit to state a material fact 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; provided, however, that this representation and warranty shall not apply to any statements or omissions made in reliance upon and in conformity with the Underwriter Information (as defined in Section 9(b));

(c) For the purposes of this Agreement, the “Applicable Time” is 7:20 p.m. (Eastern time) on the date of this Agreement; the Pricing Prospectus, as supplemented by the information set forth on Schedule II(c) hereto, taken together (collectively, the “Pricing

Disclosure Package”), as of the Applicable Time did not, and as of each Time of Delivery (as defined in Section 4(a) of this Agreement) will not, include any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements made therein, in the light of the circumstances under which they were made, not misleading; and each Issuer Free Writing Prospectus listed on Schedule II(a) hereto does not conflict with the information contained in the Registration Statement, the Pricing Prospectus or the Prospectus; and each such Issuer Free Writing Prospectus, as supplemented by and taken together with the Pricing Disclosure Package as of the Applicable Time, did not, and as of each Time of Delivery will not, include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided, however, that this representation and warranty shall not apply to statements or omissions made in an Issuer Free Writing Prospectus in reliance upon and in conformity with the Underwriter Information;

(d) The documents incorporated by reference in the Pricing Disclosure Package and the Prospectus, when they became effective or were filed with the Commission, as the case may be, conformed in all material respects to the requirements of the Act or the Exchange Act, as applicable, and the rules and regulations of the Commission thereunder, and none of such documents contained an untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary to make the statements therein not misleading; any further documents so filed and incorporated by reference in the Pricing Disclosure Package and the Prospectus or any further amendment or supplement thereto, when such documents become effective or are filed with the Commission, as the case may be, will conform in all material respects to the requirements of the Act or the Exchange Act, as applicable, and the rules and regulations of the Commission thereunder and will not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading; provided, however, that this representation and warranty shall not apply to any statements or omissions made in reliance upon and in conformity with the Underwriter Information; and no such or any other documents were filed with the Commission since the Commission’s close of business on the business day immediately prior to the date of this Agreement and prior to the execution of this Agreement, except as set forth on Schedule II(c) hereto;

(e) The Registration Statement conforms, at the time it was declared effective, and the Prospectus and any further amendments or supplements to the Registration Statement and the Prospectus, on the date when such Prospectus, amendment or supplement is filed, will conform, in all material respects to the requirements of the Act and the rules and regulations of the Commission thereunder and do not and will not, as of the applicable effective date as to each part of the Registration Statement, as of the applicable filing date as to the Prospectus and any amendment or supplement thereto, and as of each Time of Delivery, contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading; provided, however, that this representation and warranty shall not apply to any statements or omissions made in reliance upon and in conformity with the Underwriter Information;

(f) (A) (i) At the time of filing the Registration Statement, (ii) at the time of the most recent amendment thereto for the purposes of complying with Section 10(a)(3) of the Act (whether such amendment was by post-effective amendment, incorporated report filed

pursuant to Section 13 or 15(d) of the Exchange Act or form of prospectus), and (iii) at the time the Company or any person acting on its behalf (within the meaning, for this clause only, of Rule 163(c) under the Act) made any offer relating to the Securities in reliance on the exemption of Rule 163 under the Act, the Company was a “well-known seasoned issuer” as defined in Rule 405 under the Act; and (B) at the earliest time after the filing of the Registration Statement that the Company or another offering participant made a bona fide offer (within the meaning of Rule 164(h)(2) under the Act) of the Securities, the Company was not an “ineligible issuer” as defined in Rule 405 under the Act;

(g) Each of the Company and its subsidiaries (as defined in Rule 405 under the Act) has been duly organized and is validly existing and in good standing as a corporation or other business entity under the laws of its jurisdiction of organization and is duly qualified to do business and in good standing as a foreign corporation or other business entity in each jurisdiction in which its ownership or lease of property or the conduct of its businesses requires such qualification, except where the failure to be so qualified or in good standing would not, in the aggregate, reasonably be expected to have a material adverse effect on the condition (financial or otherwise), results of operations, stockholders’ equity, properties, business or prospects of the Company and its subsidiaries taken as a whole or a material adverse effect on the performance by the Company of its obligations under this Agreement or the consummation of any of the transactions contemplated by this Agreement (a “Material Adverse Effect”); each of the Company and its subsidiaries has all power and authority necessary to own or hold its properties and to conduct the businesses in which it is engaged. The Company does not own or control, directly or indirectly, any corporation, association or other entity other than the subsidiaries listed in the Company’s Annual Report on Form 10-K for the most recent fiscal year. Other than Akcea Therapeutics, Inc., none of the subsidiaries of the Company is a “significant subsidiary” (as defined in Rule 405 under the Act);

(h) Except as described in each of the Pricing Disclosure Package and the Prospectus, neither the Company nor any of its subsidiaries has sustained, since the date of the latest financial statements reviewed or audited by Ernst & Young LLP and included or incorporated by reference in the Pricing Disclosure Package, any loss or interference with its business from fire, explosion, flood or other calamity, whether or not covered by insurance, or from any labor dispute or court or governmental action, order or decree, and, since such date, there has not been any change in the total current assets, capital stock or long-term debt of the Company or any of its subsidiaries (other than a change in the number of outstanding shares of Stock due to the issuance of shares upon the exercise of options or the vesting of restricted Stock awards under the Company’s previous or currently existing equity incentive and other similar officer, director or employee benefit plans or the conversion of the Company’s convertible promissory notes outstanding prior to the date of this Agreement and provided such options, restricted Stock awards and convertible promissory notes are described in the Pricing Disclosure Package) or any adverse change, or any development involving a prospective adverse change, in or affecting the condition (financial or otherwise), results of operations, stockholders’ equity, properties, management, business or prospects of the Company and its subsidiaries, taken as a whole, in each case except as would not, in the aggregate, reasonably be expected to have a Material Adverse Effect;

(i) (i) The Company and each of its subsidiaries, as applicable, have good and marketable title in fee simple to all real property owned by the Company and good and marketable title to all personal property owned by them, in each case free and clear of all

liens, encumbrances and defects, except such as are described in the Pricing Disclosure Package and the Prospectus and such as do not affect the value of such property and do not interfere with the use made and proposed to be made of such property by the Company or any of its subsidiaries; and (ii) all assets held under lease by the Company or any of its subsidiaries are held by them under valid, subsisting and enforceable leases, with such exceptions as do not interfere with the use made and proposed to be made of such assets by the Company or any of its subsidiaries; except, in the case of (i) and (ii), as would not, in the aggregate, reasonably be expected to have a Material Adverse Effect;

(j) The Company has an authorized capitalization as set forth in each of the Pricing Disclosure Package and the Prospectus on the dates indicated therein, and all of the issued shares of capital stock of the Company have been duly authorized and validly issued, are fully paid and non-assessable, conform in all material respects to the description thereof contained in each of the Pricing Disclosure Package and the Prospectus and were issued in compliance with federal and state securities laws and not in violation of any preemptive right, resale right, right of first refusal or similar right. All of the Company's options, warrants and other rights to purchase or exchange any securities for shares of the Company's capital stock have been duly authorized and validly issued, conform to the description thereof contained in each of the Pricing Disclosure Package and the Prospectus and were issued in compliance with federal and state securities laws. There are no outstanding options to purchase, or any rights or warrants to subscribe for, or any securities or obligations convertible into, or any contracts or commitments to issue or sell, any shares of the Company's capital stock, any shares of capital stock of any subsidiary, or any such warrants, convertible securities or obligations, except as set forth in the Pricing Disclosure Package and the Prospectus and except for shares of the Company's capital stock and options to purchase shares of the Company's capital stock granted under, or contracts or commitments pursuant to, the Company's previous or currently existing equity incentive and other similar officer, director or employee benefit plans. There is no and has been no policy or practice of the Company to intentionally coordinate the grant of options to employees with the release or other public announcement of material information regarding the Company or its results of operations or prospects to minimize the exercise price of such options. All of the issued shares of capital stock of each subsidiary of the Company have been duly authorized and validly issued, are fully paid and non-assessable and are owned directly or indirectly by the Company, free and clear of all liens, encumbrances, equities or claims, except for such liens, encumbrances, equities or claims as would not, in the aggregate, reasonably be expected to have a Material Adverse Effect;

(k) Except as identified in the Pricing Disclosure Package and the 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 any securities being registered pursuant to the Registration Statement or any other registration statement filed by the Company under the Act;

(l) The Company has all requisite corporate power to execute, deliver and perform its obligations under this Agreement. This Agreement has been duly and validly authorized, executed and delivered by the Company;

(m) The Securities have been duly and validly authorized and, when issued and delivered against payment therefor as provided herein, will be duly and validly issued and fully paid and non-assessable and will conform in all material respects to the description of the Securities contained in the Pricing Disclosure Package and the Prospectus; and the issuance of the Securities is not subject to any preemptive or similar rights;

(n) Prior to the date hereof, the Company and its affiliates have not taken, directly or indirectly, any action (A) designed to or that has constituted or that reasonably can be expected to cause or result in the stabilization or manipulation of the price of any security of the Company in connection with the offering of the Securities to facilitate the sale or resale of the Securities or (B) prohibited by Regulation M under the Exchange Act;

(o) The issue and sale of the Securities, the execution, delivery and performance by the Company of its obligations under this Agreement, the application of the net proceeds from the sale of the Securities as described under "Use of Proceeds" in each of the Pricing Disclosure Package and the Prospectus and the consummation of the transactions contemplated by this Agreement, will not (i) conflict with or result in a breach or violation of any of the terms or provisions of, impose any lien, charge or encumbrance upon any property or assets of the Company or its subsidiaries, or constitute a default under, any indenture, mortgage, deed of trust, loan agreement, license, lease or other 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 property or assets of the Company or any of its subsidiaries is subject, (ii) result in any violation of the provisions of the charter or by-laws or similar organizational document of the Company or any of its subsidiaries or (iii) result in any violation of any statute or any judgment, order, decree, rule or regulation of any court or arbitrator or federal, state, local or foreign governmental agency or regulatory authority having jurisdiction over the properties or assets of the Company or any of its subsidiaries or any of their properties or assets ("Governmental Authority"), except, with respect to clauses (i) and (iii), conflicts, breaches, violations, impositions or defaults that would not reasonably be expected to have a Material Adverse Effect;

(p) No consent, approval, authorization or order of, or filing, registration or qualification with, any Governmental Authority is required for the issue and sale of the Securities, the execution, delivery and performance by the Company of its obligations under this Agreement, the application of the net proceeds from the sale of the Securities as described under "Use of Proceeds" in each of the Pricing Disclosure Package and the Prospectus and the consummation of the transactions contemplated by this Agreement, except for such consents, approvals, authorizations, orders, filings, registrations or qualifications as have been obtained under the Act or may be required under state securities or Blue Sky laws in connection with the purchase and distribution of the Securities by the Underwriters and listing of the Securities on The Nasdaq Global Select Market ("Nasdaq");

(q) Neither the Company nor any of its subsidiaries (i) is in violation of its charter or by-laws (or similar organizational documents), (ii) is in default, and no event has occurred that, with notice or lapse of time or both, would constitute such a default, in the due performance or observance of any term, covenant, condition or other obligation contained in any indenture, mortgage, deed of trust, loan agreement, license or other agreement or instrument to which it is a party or by which it is bound or to which any of its properties or assets is subject or (iii) is in violation of any statute or any order, rule or

regulation of any Governmental Authority or has failed to obtain any license, permit, certificate, franchise or other governmental authorization or permit necessary to the ownership of its property or to the conduct of its business, except in the case of clauses (ii) and (iii), to the extent any such conflict, breach, violation or default would not, in the aggregate, reasonably be expected to have a Material Adverse Effect;

(r) (i) The statements set forth in each of the Pricing Disclosure Package and the Prospectus under the caption “Description of Capital Stock,” insofar as they purport to constitute a summary of the terms of the Securities and the provisions of the laws and documents referred to therein, and under the caption “Underwriting,” insofar as they purport to describe the provisions of the laws and documents referred to therein, are accurate in all material respects; provided that the Company makes no such representation or warranty under this Section 1(r) to the extent, but only to the extent, that such statement was made under the caption “Underwriting” in the Pricing Disclosure Package or the Prospectus in reliance upon and in conformity with the Underwriter Information and (ii) the statements set forth in each of the Pricing Disclosure Package and the Prospectus under the caption “Material U.S. Federal Income Tax Consequences to Non-U.S. Holders of our Common Stock,” insofar as such statements purport to summarize matters of U.S. federal income tax laws and legal conclusions with respect thereto, fairly present, to the extent required by the Act and the rules and regulations thereunder, in all material respects, such matters;

(s) The statistical and market-related data included under the captions “Business” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the Company’s annual report on Form 10-K for the year ended December 31, 2023 and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the Company’s quarterly reports on Form 10-Q for the periods ended March 31, 2024 and June 30, 2024, incorporated by reference in the Pricing Disclosure Package and the consolidated financial statements of the Company and its subsidiaries included or incorporated by reference in the Pricing Disclosure Package are based on or derived from sources which the Company reasonably believes are reliable and accurate, and such data agree with the sources from which they are derived in all material respects;

(t) Except as described in the Pricing Disclosure Package and the Prospectus, there are no legal or governmental proceedings pending to which the Company or any of its subsidiaries is a party or of which any property or assets of the Company or any of its subsidiaries is the subject that would, in the aggregate, reasonably be expected to have a Material Adverse Effect; and to the Company’s knowledge, no such proceedings are threatened in writing or contemplated by Governmental Authorities or others;

(u) There are no legal or governmental proceedings or contracts or other documents that would be required to be described in a registration statement of the Company filed under the Act or, in the case of documents, would be required to be filed as exhibits to a registration statement of the Company pursuant to Item 601(10) of Regulation S-K that have not been described or incorporated by reference in the Registration Statement, the Pricing Disclosure Package and the Prospectus. Neither the Company nor any of its subsidiaries has knowledge that any other party to any such contract, agreement or arrangement has any intention not to render full performance as contemplated by the terms thereof. The statements made or incorporated by reference in the Registration Statement, the Pricing Disclosure Package and the Prospectus insofar as

they purport to constitute summaries of the terms of statutes, rules or regulations, legal or governmental proceedings or contracts and other documents, constitute accurate summaries of the terms of such statutes, rules and regulations, legal and governmental proceedings and contracts and other documents in all material respects;

(v) The Company is subject to Section 13 or 15(d) of the Exchange Act;

(w) Neither the Company nor any of its subsidiaries is, and after giving effect to the offer and sale of the Securities and the application of the net proceeds therefrom as described under "Use of Proceeds" in each of the Pricing Disclosure Package and the Prospectus, neither the Company nor any of its subsidiaries will be, an "investment company," as such term is defined in the United States Investment Company Act of 1940, as amended (the "Investment Company Act");

(x) Neither the Company nor its affiliates nor any other person acting on behalf of the Company has sold or issued any securities that would be integrated with the offering of the Securities contemplated by this Agreement pursuant to the Act, the rules and regulations thereunder or the interpretations thereof by the Commission;

(y) The historical financial statements (including the related notes and supporting schedules) included or incorporated by reference in the Registration Statement, the Pricing Disclosure Package and the Prospectus present fairly in all material respects the financial condition, results of operations and cash flows of the entities purported to be shown thereby, at the dates and for the periods indicated, and have been prepared in conformity with U.S. GAAP applied on a consistent basis throughout the periods involved. The other financial information and data included or incorporated by reference in the Prospectus are, in all material respects, accurately presented and prepared on a basis consistent with such financial statements and the books and records of the Company. The interactive data in eXtensible Business Reporting Language incorporated by reference in the Pricing Disclosure Package and the Prospectus fairly present the information called for in all material respects and has been prepared in all material respects in accordance with the Commission's rules and guidelines applicable thereto;

(z) (i) The Company and each of its subsidiaries have established and maintain disclosure controls and procedures (as such term is defined in Rule 13a-15 under the Exchange Act), (ii) such disclosure controls and procedures are designed to ensure that the information required to be disclosed by the Company in the reports they file or submit under the Exchange Act is accumulated and communicated to management of the Company and its subsidiaries, including their respective principal executive officers and principal financial officers, as appropriate, to allow timely decisions regarding required disclosure to be made; and (iii) such disclosure controls and procedures are effective in all material respects to perform the functions for which they were established;

(aa) The Company and each of its subsidiaries (i) make and keep accurate books and records and (ii) maintain and have maintained effective internal control over financial reporting as defined in Rule 13a-5 under the Exchange Act and a system of internal accounting controls sufficient to provide reasonable assurance that (A) transactions are executed in accordance with management's general or specific authorization, (B) transactions are recorded as necessary to permit preparation of its financial statements in conformity with U.S. GAAP and to maintain accountability for its

assets, (C) access to its assets is permitted only in accordance with management's general or specific authorization, (D) the reported accountability for its assets is compared with existing assets at reasonable intervals and appropriate action is taken with respect to any differences and (E) the interactive data in eXtensible Business Reporting Language incorporated by reference in the Registration Statement, the Pricing Disclosure Package and the Prospectus fairly present the information called for in all material respects and is prepared in all material respects in accordance with the Commission's rules and guidelines applicable thereto;

(bb) Ernst & Young LLP, who have certified certain financial statements of the Company, whose report appears or is incorporated by reference in the Registration Statement, the Pricing Disclosure Package and the Prospectus are independent public accountants as required by the Act and the rules and regulations thereunder;

(cc) Since the date of the most recent balance sheet of the Company and its consolidated subsidiaries reviewed or audited by Ernst & Young LLP and the audit committee of the board of directors of the Company, (i) the Company has not been advised of (A) any significant deficiencies in the design or operation of internal controls that would adversely affect the ability of the Company or any of its subsidiaries to record, process, summarize and report financial data, or any material weaknesses in internal controls or (B) any fraud, whether or not material, that involves management or other employees who have a significant role in the internal controls of the Company and each of its subsidiaries, and (ii) since that date, there have been no significant changes in internal controls or in other factors that would significantly affect internal controls, including any corrective actions with regard to significant deficiencies and material weaknesses;

(dd) Since the date as of which information is given in the Pricing Disclosure Package and except as otherwise described in the Pricing Disclosure Package and the Prospectus, the Company has not (i) issued or granted any securities (except pursuant to the Company's previous or currently existing equity incentive and other similar officer, director or employee benefit plans), (ii) incurred any liability or obligation, direct or contingent, other than liabilities and obligations that were incurred in the ordinary course of business, (iii) entered into any material transaction not in the ordinary course of business or (iv) declared or paid any dividend on its capital stock;

(ee) "Intellectual Property" means all patents, inventions, trademarks, service marks, trade names, domain names and other source indicators, copyrights and copyrightable works, licenses, know-how, software, systems and technology (including trade secrets, data and other unpatented and/or unpatentable proprietary or confidential information, systems or procedures) and all other worldwide intellectual property or proprietary rights (including all registrations and applications for registration of, and all goodwill associated with, the foregoing), including, as applicable, without limitation, all such property described in the Pricing Disclosure Package or the Prospectus as being owned or licensed by the Company or its subsidiaries. To the knowledge of the Company, the Company and each of its subsidiaries owns or possesses adequate rights to use all Intellectual Property used in, held for use in or necessary for the conduct of its respective business as currently conducted and as proposed to be conducted in the Pricing Disclosure Package or the Prospectus, except where the failure to own or possess such rights would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect. To the knowledge of the Company, the Company's and its subsidiaries' conduct of their respective businesses has not infringed, misappropriated or

otherwise violated, and does not infringe, misappropriate or otherwise violate, any Intellectual Property of any person, other than such infringements, misappropriations or violations which would not, individually or in the aggregate, have a Material Adverse Effect. Except as disclosed in the Pricing Disclosure Package and the Prospectus, (A) there is no infringement, misappropriation or other violation by third parties of any Intellectual Property of the Company or its subsidiaries, except as such infringement, misappropriation or violation would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect; (B) there is no pending or, to the knowledge of the Company and its subsidiaries, threatened in writing action, suit, proceeding or claim by others challenging or seeking to deny or restrict the rights of the Company or its subsidiaries in or to any Intellectual Property, and the Company is unaware of any facts which would form a reasonable basis for any such claim which would, individually or in the aggregate, have a Material Adverse Effect; (C) the Intellectual Property owned by the Company and its subsidiaries and, to the knowledge of the Company, the Intellectual Property licensed to the Company and its subsidiaries has not been adjudged invalid or unenforceable, in whole or in part, and there is no pending or threatened in writing action, suit, proceeding or claim by others challenging the validity, enforceability or scope of any Intellectual Property of the Company or its subsidiaries, and the Company is unaware of any facts which would form a reasonable basis for any such claim which would, individually or in the aggregate, have a Material Adverse Effect; (D) there is no pending or threatened in writing action, suit, proceeding or claim by others that the Company or its subsidiaries have infringed, misappropriated or otherwise violated any Intellectual Property or other proprietary rights of others, the Company and its subsidiaries have not received any written notice of such action, suit, proceeding or claim and the Company is unaware of any other facts which would form a reasonable basis for any such action, suit, proceeding or claim which would, individually or in the aggregate, have a Material Adverse Effect; and (E) to the Company's knowledge, no employee of the Company or a subsidiary of the Company is in or has ever been in violation of any term of any employment contract, patent disclosure agreement, invention assignment agreement, non-competition agreement, non-solicitation agreement, nondisclosure agreement or any restrictive covenant to or with a former employer, where the basis of such violation relates to (i) such employee's employment with the Company or a subsidiary of the Company, or (ii) actions undertaken by the employee while employed with the Company or a subsidiary of the Company, except (in the case of (i) and (ii)) for such violations as would not, individually or in the aggregate, have a Material Adverse Effect. (i) The Company and its subsidiaries have at all times taken reasonable steps to maintain the confidentiality of all Intellectual Property the value of which to the Company and its subsidiaries is contingent upon maintaining the confidentiality thereof, and (ii), to the knowledge of the Company, no such Intellectual Property has been disclosed other than to employees, representatives and agents of the Company, all of whom are bound by written confidentiality agreements, except, in each case, as would not, individually or in the aggregate, have a Material Adverse Effect. The Company is not a party to or bound by any options, licenses or agreements with respect to Intellectual Property that are required to be described in a registration statement filed under the Act or would be required to be filed as exhibits to a registration statement of the Company pursuant to Item 601(10) of Regulation S-K that have not been described or incorporated by reference in the Registration Statement, the Pricing Disclosure Package and the Prospectus;

(ff) The Company and its subsidiaries' information technology assets and equipment, computers, systems, networks, hardware, software, websites, applications and databases (collectively, "IT Systems") are adequate for, and to the Company's

knowledge operate and perform in all material respects as required in connection with, the operation of the business of the Company and its subsidiaries as currently conducted and as proposed to be conducted in the Pricing Disclosure Package or the Prospectus, free and clear of all material bugs, errors, defects, Trojan horses, time bombs, malware and other corruptants which would, individually or in the aggregate, reasonably be expected to result in a Material Adverse Effect. The Company and its subsidiaries have implemented and maintained commercially reasonable controls, policies, procedures, and safeguards designed to maintain and protect their confidential information and the integrity, continuous operation, redundancy and security of all IT Systems and data (including all personal, personally identifiable, household, sensitive, confidential or regulated data (including protected health information)) (“Personal Data”) collected, stored, used or otherwise processed in connection with their businesses, and to the Company’s knowledge there have been no breaches, violations, outages or unauthorized uses of or accesses to same, nor any incidents under internal review or investigations relating to the same, in each case, other than as described in the Pricing Disclosure Package or the Prospectus, or which would, individually or in the aggregate, have a Material Adverse Effect;

(gg) To the extent applicable, the Company and each of its subsidiaries have complied with and are presently in compliance with all Applicable Laws (including without limitation, to the extent applicable, the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act, the California Consumer Privacy Act, as amended by the California Privacy Rights Act, and the European Union’s General Data Protection Regulation) and all judgments, orders, rules and regulations of any court or arbitrator or governmental or regulatory authority, internal and external policies, and contractual obligations, relating to the privacy and security of IT Systems and the collection, use, transfer, import, export, storage, disposal and disclosure of Personal Data and to the protection of such IT Systems and Personal Data from unauthorized use, access, misappropriation or modification (“Data Security Obligations”), except for such non-compliance which would not, individually or in the aggregate, have a Material Adverse Effect. The Company and its subsidiaries have not received any notification of or complaint regarding, and, to the knowledge of the Company, are not aware of any other facts that, individually or in the aggregate, would reasonably indicate, non-compliance with any Data Security Obligation where such notification, complaint or non-compliance would, individually or in the aggregate, reasonably be expected to result in a Material Adverse Effect. There is no pending, or to the knowledge of the Company, threatened, claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action by or before any Governmental Authority pending or threatened alleging non-compliance with any Data Security Obligation. To the knowledge of the Company, there has been no material unauthorized access to such Personal Data. The Company and its subsidiaries have made all disclosures to users or customers required by Data Security Obligations, and no such disclosures have been inaccurate or in violation of any Data Security Obligations, except for such disclosure failures, inaccuracies or violations which would not, individually or in the aggregate, have a Material Adverse Effect;

(hh) Except as described in the Pricing Disclosure Package and the Prospectus, the Company and each of its subsidiaries: (A) are and at all times have been in compliance in all material respects with all statutes, rules, regulations, or guidance applicable to the ownership, testing, development, manufacture, packaging, processing, use, distribution, marketing, labeling, promotion, sale, offer for sale, storage, import, export or disposal of

any product or product candidate manufactured or distributed by the Company and its subsidiaries (“Applicable Laws”); (B) have not received any U.S. Food and Drug Administration (“FDA”) Form 483, notice of adverse finding, material warning letter, untitled letter or other correspondence or notice from the FDA or any other Governmental Authority alleging or asserting material noncompliance with any Applicable Laws or any licenses, certificates, approvals, clearances, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws (“Authorizations”); (C) possess all Authorizations and such Authorizations are valid and in full force and effect and are not in violation of any material term of any such Authorizations; (D) have not received written notice of any claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from any Governmental Authority or third party alleging that any product operation or activity is in violation of any Applicable Laws or Authorizations and have no knowledge that any such Governmental Authority or third party is considering any such claim, litigation, arbitration, action, suit, investigation or proceeding (except in each case as it relates to such a notice from a third party or knowledge of possible action by a third party (and for clarity, not from a Governmental Authority) that the Company reasonably believes is (i) without merit or (ii) unlikely to be material); (E) have not received notice that any Governmental Authority has taken, is taking or intends to take action to limit, suspend, modify or revoke any Authorizations and have no knowledge that any such Governmental Authority is considering such action; (F) have filed, obtained, maintained or submitted all reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by any Applicable Laws or Authorizations and represent that all such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were complete and correct on the date filed (or were corrected or supplemented by a subsequent submission), except where the failure to so file, obtain, maintain or submit would not reasonably be expected to have a Material Adverse Effect; and (G) have not, either voluntarily or involuntarily, initiated, conducted, or issued or caused to be initiated, conducted or issued, any recall, market withdrawal or replacement, material safety alert, post-sale warning, “dear doctor” letter, or other notice or action relating to the alleged lack of safety or efficacy of any of its products or any alleged product defect or violation and, to the Company’s knowledge, no third party has initiated, conducted or intends to initiate any such notice or action;

(ii) The studies, tests and preclinical and clinical trials conducted by or on behalf of the Company and each of its subsidiaries or with respect to the Company’s, or its subsidiaries’ products or product candidates were and, if still pending, are being conducted in all material respects in accordance with experimental protocols, procedures and controls pursuant to accepted professional scientific standards and all Applicable Laws and Authorizations, including, without limitation, the Federal Food, Drug and Cosmetic Act and the rules and regulations promulgated thereunder; the descriptions of the results of such studies, tests and trials contained in the Pricing Disclosure Package and the Prospectus are accurate and complete in all material respects and fairly present the data derived from such studies, tests and trials; except to the extent disclosed in the Pricing Disclosure Package and the Prospectus, the Company is not aware of any studies, tests or trials, the results of which the Company believes reasonably refute the study, test, or trial results described or referred to in the Pricing Disclosure Package and the Prospectus when viewed in the context in which such results are described and the clinical state of development; and, to the knowledge of the Company, neither the Company nor its subsidiaries, nor any of the Company’s or its subsidiaries’ collaboration partners, have received any notices or correspondence from any Governmental Authority requiring the

termination, suspension or material modification of any studies, tests or preclinical or clinical trials conducted by or on behalf of the Company or its subsidiaries or with respect to the Company's or its subsidiaries' products or product candidates. All of the descriptions in the Pricing Disclosure Package and the Prospectus of the legal and governmental procedures and requirements of the FDA or any foreign, state or local governmental body exercising comparable authority are accurate in all material respects. Except as described in the Pricing Disclosure Package and the Prospectus and except as would not reasonably be expected to have a Material Adverse Effect, the Company has not received any notices or statements from any Governmental Authority, and otherwise has no knowledge, that (1) any investigational new drug application for any potential product of the Company is or has been rejected or determined to be non-approvable or conditionally approvable; and (2) any license, approval, permit or authorization to conduct any clinical trial of any potential product of the Company has been, will be or may be suspended, revoked, materially modified or limited;

(jj) The Company and each of its subsidiaries have such permits, licenses, patents, franchises, certificates of need and other approvals or authorizations of such Governmental Authorities ("Permits") as are necessary under applicable law to own their properties and conduct their businesses in the manner described in the Pricing Disclosure Package and the Prospectus, except for any of the foregoing that would not, in the aggregate, reasonably be expected to have a Material Adverse Effect or except as described in the Pricing Disclosure Package and the Prospectus; each of the Company and its subsidiaries has fulfilled and performed all of its obligations with respect to the Permits, and no event has occurred that allows, or after notice or lapse of time would allow, revocation or termination thereof or results in any other impairment of the rights of the holder or any such Permits, except for any of the foregoing that would not reasonably be expected to have a Material Adverse Effect or except as described in the Pricing Disclosure Package;

(kk) (i) Each "employee benefit plan" (within the meaning of Section 3(3) of the Employee Retirement Security Act of 1974, as amended ("ERISA")) for which the Company or any member of its "Controlled Group" (defined as any organization which is a member of a controlled group of corporations within the meaning of Section 414 of the Internal Revenue Code of 1986, as amended (the "Code")) would have any liability (each a "Plan") has been maintained in material compliance with its terms and with the requirements of all applicable statutes, rules and regulations including ERISA and the Code; (ii) with respect to each Plan subject to Title IV of ERISA (a) no "reportable event" (within the meaning of Section 4043(c) of ERISA) has occurred or is reasonably expected to occur, (b) for each Plan that is subject to the funding rules of Section 412 of the Code or Section 302 of ERISA, no Plan has failed (whether or not waived), or is reasonably expected to fail, to satisfy the minimum funding standards (within the meaning of Section 302 of ERISA or Section 412 of the Code) applicable to such Plan, (c) the fair market value of the assets under each Plan exceeds the present value of all benefits accrued under such Plan (determined based on those assumptions used to fund such Plan) and (d) neither the Company or any member of its Controlled Group has incurred, or reasonably expects to incur, any 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 (iii) each Plan that is intended to be qualified under Section 401(a) of the Code is so qualified and nothing has occurred, whether by action or by failure to act, which would cause the loss of such qualification;

(ll) Neither the Company nor any subsidiary is in violation of or has received notice of any violation with respect to any federal or state law relating to discrimination in the hiring, promotion or pay of employees, nor any applicable federal or state wage and hour laws, nor any state law precluding the denial of credit due to the neighborhood in which a property is situated, the violation of any of which would reasonably be expected to have a Material Adverse Effect;

(mm) Except as described in the Pricing Disclosure Package and the Prospectus, no labor disturbance by the employees of the Company or any of its subsidiaries exists or, to the knowledge of the Company, is imminent that would reasonably be expected to have a Material Adverse Effect, and the Company is not aware of any existing or imminent labor disturbance by, or dispute with, the employees of any of the Company's or any of the Company's subsidiaries' collaborative partners, principal suppliers, contractors or customers that would reasonably be expected to have a Material Adverse Effect;

(nn) The Company and each of its subsidiaries have filed all U.S. federal, state, local and foreign tax returns required to be filed through the date hereof, subject to permitted extensions, such tax returns are true and complete, all taxes due thereon have been paid, and no tax deficiency has been determined adversely to the Company or any of its subsidiaries (nor does the Company nor any of its subsidiaries have any knowledge of any tax deficiencies which could reasonably be expected to be determined adversely to the Company or its subsidiaries), except, in each case, as would not, in the aggregate, reasonably be expected to have a Material Adverse Effect;

(oo) The Company and each of its subsidiaries (i) are, and at all times prior hereto were, in compliance with all laws, regulations, ordinances, rules, orders, judgments, decrees, permits or other legal requirements of any Governmental Authority, including without limitation any international, national, state, provincial, regional, or local authority, relating to the protection of human health or safety, the environment, or natural resources, or to hazardous or toxic substances or wastes, pollutants or contaminants ("Environmental Laws") applicable to such entity, which compliance includes, without limitation, obtaining, maintaining and complying with all permits and authorizations and approvals required by Environmental Laws to conduct their respective businesses, and (ii) have not received written notice of any actual or alleged violation of Environmental Laws, or of any potential liability for or other obligation concerning the presence, disposal or release of hazardous or toxic substances or wastes, pollutants or contaminants, except in the case of clause (i) or (ii) where such non-compliance, violation, liability, or other obligation would not, in the aggregate, reasonably be expected to have a Material Adverse Effect. Except as described in the Pricing Disclosure Package and the Prospectus, (A) there are no proceedings that are pending, or known to be contemplated, against the Company or any of its subsidiaries under Environmental Laws in which a Governmental Authority is also a party, other than such proceedings regarding which it is reasonably believed no monetary sanctions of \$250,000 or more will be imposed, (B) the Company and its subsidiaries are not aware of any issues regarding compliance with Environmental Laws, or liabilities or other obligations under Environmental Laws or concerning hazardous or toxic substances or wastes, pollutants or contaminants, that would reasonably be expected to have a Material Adverse Effect, and (C) none of the Company and its subsidiaries anticipates material capital expenditures relating to Environmental Laws;

(pp) Except such as are described in the Pricing Disclosure Package and the Prospectus, the Company and each of its subsidiaries carry, or are covered by, insurance

from insurers of recognized financial responsibility in such amounts and covering such risks as, based on the Company's internal assessments, is adequate for the conduct of their respective businesses and the value of their respective properties and as is customary for companies engaged in similar businesses in similar industries. All policies of insurance of the Company and its subsidiaries are in full force and effect; the Company and its subsidiaries are in compliance with the terms of such policies in all material respects; and neither the Company nor any of its subsidiaries has received notice from any insurer or agent of such insurer that capital improvements or other expenditures are required or necessary to be made in order to continue such insurance; there are no 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; and neither the Company nor any such subsidiary has 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 reasonably be expected to have a Material Adverse Effect;

(qq) The operations of the Company and its subsidiaries are and have been conducted at all times in compliance with the requirements of applicable anti-money laundering laws, including, but not limited to, the Bank Secrecy Act of 1970, as amended by the USA PATRIOT ACT of 2001, and the rules and regulations promulgated thereunder, and the anti-money laundering laws of the various jurisdictions in which the Company and 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 Authority (collectively, the "Money Laundering Laws"), and no action, suit or proceeding by or before any court or Governmental Authority involving the Company or any of its subsidiaries with respect to the Money Laundering Laws is pending or, to the knowledge of the Company, threatened;

(rr) Neither the Company nor any of its subsidiaries nor, to the knowledge of the Company, any director, officer, agent, employee or affiliate of the Company or any of its subsidiaries is currently the subject or the target of any sanctions administered or enforced by the U.S. Government, including, without limitation, the Office of Foreign Assets Control of the U.S. Department of the Treasury ("OFAC"), or the U.S. Department of State and including, without limitation, the designation as a "specially designated national" or "blocked person," the European Union, His Majesty's Treasury, the United Nations Security Council or other relevant sanctions authority (collectively, "Sanctions"), nor is the Company or any of its subsidiaries located, organized or resident in a country or territory that is the subject or target of comprehensive Sanctions (a "Sanctioned Country"), and the Company will not directly or indirectly use the proceeds of the offering of the Securities hereunder, or lend, contribute or otherwise make available such proceeds to any subsidiary, joint venture partner or other person or entity (i) to fund or facilitate any activities of or business with any person, that, at the time of such funding, is the subject or the target of Sanctions, or in or with a Sanctioned Country or (ii) in any other manner that will result in a violation by any person (including any person participating in the transaction, whether as underwriter, advisor, investor or otherwise) of Sanctions;

(ss) Neither the Company nor any of its subsidiaries, nor, to the knowledge of the Company, any director, officer, agent, employee, affiliate or other person associated with or acting on behalf of the Company or any of its subsidiaries, has (i) used any corporate funds for any unlawful contribution, gift, entertainment or other unlawful expense

relating to political activity; (ii) made any direct or indirect unlawful payment to any foreign or domestic government official or employee from corporate funds; (iii) violated or is in violation of any provision of the Foreign Corrupt Practices Act of 1977, the Bribery Act 2010 of the United Kingdom or any other applicable anti-bribery or anti-corruption law; or (iv) made any bribe, improper rebate, payoff, influence payment, kickback or other unlawful payment;

(tt) No subsidiary of the Company is currently prohibited, directly or indirectly, from paying any dividends to the Company, from making any other distribution on such subsidiary's capital stock, from repaying to the Company any loans or advances to such subsidiary from the Company or from transferring any of such subsidiary's property or assets to the Company or any other subsidiary of the Company, except as described in the Pricing Disclosure Package;

(uu) There is and has been no failure on the part of the Company and any of the Company's directors or officers, in their capacities as such, to comply in all material respects with the provisions of the Sarbanes-Oxley Act of 2002, as amended, and the rules and regulations promulgated in connection therewith;

(vv) The Company is not aware of any relationship, direct or indirect, that would be required to be described in a registration statement of the Company pursuant to Item 404 of Regulation S-K, exists between or among the Company, on the one hand, and the directors, officers, stockholders, customers or suppliers of the Company, on the other hand, that has not been described in the Registration Statement, the Pricing Disclosure Package and the Prospectus;

(ww) Each forward-looking statement (within the meaning of Section 27A of the Act and Section 21E of the Exchange Act) contained or incorporated by reference in the Pricing Disclosure Package and the Prospectus has been made with a reasonable basis, at the time it was made, or has been disclosed in good faith, at the time it was disclosed;

(xx) On and immediately after each Time of Delivery, each of the Company and its subsidiaries (after giving effect to the issuance of the Securities and to the other transactions related thereto as described in each of the Pricing Disclosure Package and the Prospectus) will be Solvent. As used in this paragraph, the term "Solvent" means, with respect to a particular date, that on such date (i) the present fair market value (or present fair saleable value) of the assets of each of the Company and its subsidiaries is not less than the total amount required to pay the probable liabilities on its total existing debts and liabilities (including contingent liabilities) as they become absolute and matured, (ii) each of the Company and its subsidiaries is able to realize upon its assets and pay its debts and other liabilities, contingent obligations and commitments as they mature and become due in the normal course of business, (iii) assuming the sale of the Securities as contemplated by this Agreement and each of the Pricing Disclosure Package and the Prospectus, neither the Company nor its subsidiaries is incurring debts or liabilities beyond its ability to pay as such debts and liabilities mature; and (iv) neither the Company nor its subsidiaries is engaged in any business or transaction, and neither of them is about to engage in any business or transaction, for which its property would constitute unreasonably small capital after giving due consideration to the prevailing practice in the industry in which each of the Company and its subsidiaries is engaged. In computing the amount of such contingent liabilities at any time, it is intended that such liabilities will be computed at the amount that, in the light of all the facts and circumstances existing at such time, represents the amount that can reasonably be expected to become an actual or matured liability; and

(yy) There are no debt securities or preferred stock of, or guaranteed by, the Company that are rated by a “nationally recognized statistical rating organization,” as such term is defined in Section 3(a)(62) of the Exchange Act.

2. Subject to the terms and conditions herein set forth, (a) the Company agrees to issue and sell to each of the Underwriters, and each such Underwriter agrees, severally and not jointly, to purchase from the Company, at a purchase price per share of \$42.6020, the number of Firm Securities set forth opposite the name of such Underwriter in Schedule I hereto, and (b) in the event and to the extent that the Representatives shall exercise the election to purchase Optional Securities on behalf of the Underwriters as provided below, the Company agrees to issue and sell to each of the Underwriters, and each such Underwriter agrees, severally and not jointly, to purchase from the Company, at the purchase price per share set forth in clause (a) of this Section 2 (provided that the purchase price per Optional Security shall be reduced by an amount per share equal to any dividends or distributions declared by the Company and payable on the Firm Securities but not payable on the Optional Securities), that portion of the number of Optional Securities as to which such election shall have been exercised (to be adjusted by the Representatives so as to eliminate fractional shares), determined by multiplying such number of Optional Securities by a fraction, the numerator of which is the maximum number of Optional Securities that such Underwriter is entitled to purchase as set forth opposite the name of such Underwriter in Schedule I hereto and the denominator of which is the maximum number of Optional Securities that all of the Underwriters are entitled to purchase hereunder.

The Company hereby grants to the Underwriters the right to purchase at their election up to 1,725,000 Optional Securities, at the purchase price per share set forth in clause (a) of this Section 2, for the sole purpose of covering sales of shares in excess of the number of Firm Securities, provided that the purchase price per Optional Security shall be reduced by an amount per share equal to any dividends or distributions declared by the Company and payable on the Firm Securities but not payable on the Optional Securities. Any such election to purchase Optional Securities may be exercised only by written notice from the Representatives to the Company, given within a period of 30 calendar days from the date of this Agreement, setting forth the aggregate number of Optional Securities to be purchased and the date on which such Optional Securities are to be delivered, as determined by the Representatives but in no event earlier than the First Time of Delivery (as defined in Section 4(a) hereof) or, unless the Representatives and the Company otherwise agree in writing, earlier than one or later than ten New York Business Days (as defined in Section 4(b) hereof) after the date of such notice.

3. Upon the authorization by the Representatives of the release of the Securities, the several Underwriters propose to offer the Securities for sale upon the terms and conditions set forth in this Agreement, the Pricing Prospectus and the Prospectus.

4. (a) The Securities to be purchased by each Underwriter hereunder, in definitive or book-entry form, and in such authorized denominations and registered in such names as the Representatives may request upon at least forty-eight hours' prior notice to the Company, shall be delivered by or on behalf of the Company to the Representatives, through the facilities of the Depository Trust Company (“DTC”), for the account of such Underwriter, against payment by or on behalf of such Underwriter of the purchase price therefor by wire transfer of Federal (same-day) funds to the account specified by the Company to the Representatives at least forty-eight hours in advance. The Company will cause the certificates, if any, representing the Securities to

be made available for checking and packaging at least twenty-four hours prior to each Time of Delivery with respect thereto at the office of DTC or its designated custodian (the "Designated Office"). The time and date of such delivery and payment shall be, with respect to the Firm Securities, 9:30 a.m., New York City time, on September 11, 2024 or such other time and date as the Representatives and the Company may agree upon in writing, and, with respect to the Optional Securities, 9:30 a.m., New York City time, on the date specified by the Representatives in the written notice given by the Representatives of the Representatives' election to purchase such Optional Securities on behalf of the Underwriters, or such other time and date as the Representatives and the Company may agree upon in writing; provided, however, that such delivery date must be at least one New York Business Day after such written notice is given and may not be earlier than the First Time of Delivery (as defined below) nor later than ten New York Business Days after the date of such notice. Such time and date for delivery of the Firm Securities are herein called the "First Time of Delivery," any such time and date for delivery of the Optional Securities, if not the First Time of Delivery, are herein called a "Subsequent Time of Delivery," and each such time and date for delivery are herein called a "Time of Delivery."

(b) The documents to be delivered at each Time of Delivery by or on behalf of the parties hereto pursuant to Section 8 hereof, including the cross-receipt for the Securities and any additional documents requested by the Underwriters pursuant to Section 8 hereof, will be delivered at such time and date at the offices of Davis Polk & Wardwell LLP, 1600 El Camino Real, Menlo Park, California 94025 (the "Closing Location"), and the Securities will be delivered at the Designated Office, all at such Time of Delivery. A meeting will be held at the Closing Location at 5:00 p.m., New York City time, on the New York Business Day next preceding such Time of Delivery, at which meeting the final drafts of the documents to be delivered pursuant to the preceding sentence will be available for review by the parties hereto. For the purposes of this Section 4, "New York Business Day" shall mean each Monday, Tuesday, Wednesday, Thursday and Friday which is not a day on which banking institutions in New York City are generally authorized or obligated by law or executive order to close.

5. The Company agrees with each of the Underwriters:

(a) To prepare the Prospectus in a form approved by the Representatives and to file such Prospectus pursuant to Rule 424(b) under the Act not later than the Commission's close of business on the second business day following the execution and delivery of this Agreement or such earlier time as may be required under the Act; to make no further amendment or any supplement to the Registration Statement, the Basic Prospectus or the Prospectus prior to the last Time of Delivery which shall be disapproved by the Representatives promptly after reasonable notice thereof; to advise the Representatives, promptly after it receives notice thereof, of the time when any amendment to the Registration Statement has been filed or becomes effective or any amendment or supplement to the Prospectus has been filed and to furnish the Representatives with copies thereof; to file promptly all other material required to be filed by the Company with the Commission pursuant to Rule 433(d) under the Act; to file promptly all reports and any definitive proxy or information statements required to be filed by the Company with the Commission pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act subsequent to the date of the Prospectus and for so long as the delivery of a prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) is required in connection with the offering or sale of the Securities; to advise the Representatives, promptly after it receives notice thereof, of the issuance by the Commission of any stop order or of any order preventing or suspending the use of any Preliminary Prospectus or other prospectus in respect of the Securities, of any notice of objection of the Commission to the use of the Registration Statement or any post-effective amendment thereto pursuant to Rule 401(g)(2) under the Act, of the suspension of the qualification of the

Securities for offering or sale in any jurisdiction, of the initiation or threatening of any proceeding for any such purpose, or of any request by the Commission for the amending or supplementing of the Registration Statement or the Prospectus or for additional information; and, in the event of the issuance of any stop order or of any order preventing or suspending the use of any Preliminary Prospectus or other prospectus or suspending any such qualification, to promptly use its best efforts to obtain the withdrawal of such order; and in the event of any such issuance of a notice of objection, or any other event that causes the Company to be ineligible to use the Registration Statement (including a loss of “well-known seasoned issuer” status), promptly to take such steps including, without limitation, amending the Registration Statement or filing a new registration statement, at its own expense, as may be necessary to permit offers and sales of the Securities by the Underwriters (references herein to the Registration Statement shall include any such amendment or new registration statement);

(b) If required by Rule 430B(h) under the Act, to prepare a form of prospectus in a form approved by the Representatives and to file such form of prospectus pursuant to Rule 424(b) under the Act not later than may be required by Rule 424(b) under the Act; and to make no further amendment or supplement to such form of prospectus which shall be disapproved by the Representatives promptly after reasonable notice thereof;

(c) If by the third anniversary (the “Renewal Deadline”) of the initial effective date of the Registration Statement, any of the Securities remain unsold by the Underwriters, the Company will file, if it has not already done so and is eligible to do so, a new automatic shelf registration statement relating to the Securities, in a form satisfactory to the Representatives. If at the Renewal Deadline the Company is no longer eligible to file an automatic shelf registration statement, the Company will, if it has not already done so, file a new shelf registration statement relating to the Securities, in a form satisfactory to the Representatives and will use its best efforts to cause such registration statement to be declared effective within 180 days after the Renewal Deadline. The Company will take all other action necessary or appropriate to permit the public offering and sale of the Securities to continue as contemplated in the expired registration statement relating to the Securities. References herein to the Registration Statement shall include such new automatic shelf registration statement or such new shelf registration statement, as the case may be;

(d) Promptly from time to time to take such action as the Representatives may reasonably request to qualify the Securities for offering and sale under the securities laws of such jurisdictions as the Representatives may reasonably request and to comply with such laws so as to permit the continuance of sales and dealings therein in such jurisdictions for as long as may be necessary to complete the distribution of the Securities, provided that in connection therewith the Company shall not be required to qualify as a foreign corporation or to file a general consent to service of process in any jurisdiction or otherwise subject itself to taxation in any such jurisdiction in which it was not otherwise subject to taxation;

(e) Prior to 10:00 a.m., New York City time, on the New York Business Day next succeeding the date of this Agreement (or such later time or date as may be agreed by the Company and the Representatives) and from time to time, to furnish the Underwriters with written and electronic copies of the Prospectus in New York City in such quantities as the Representatives may reasonably request, and, if the delivery of a prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) is required at any time prior to the expiration of nine months after the time of issue of the Prospectus in connection with the offering or sale of the Securities and if at such time any event shall have occurred as a result of which the Prospectus as then amended or supplemented would include an untrue statement of a material fact or omit to state any material

fact necessary in order to make the statements therein, in the light of the circumstances under which they were made when such Prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) is delivered, not misleading, or, if for any other reason it shall be necessary during such same period to amend or supplement the Prospectus or to file under the Exchange Act any document incorporated by reference in the Prospectus in order to comply with the Act or the Exchange Act, to notify the Representatives and upon the Representatives' request to file such document and to prepare and furnish without charge to each Underwriter and to any dealer in securities (whose name and address the Underwriters shall furnish to the Company) as many written and electronic copies as the Representatives may from time to time reasonably request of an amended Prospectus or a supplement to the Prospectus which will correct such statement or omission or effect such compliance; and in case any Underwriter is required to deliver a prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) in connection with sales of any of the Securities at any time nine months or more after the time of issue of the Prospectus, upon the Representatives' request but at the expense of such Underwriter, to prepare and deliver to such Underwriter as many written and electronic copies as the Representatives may request of an amended or supplemented Prospectus complying with Section 10(a)(3) of the Act;

(f) To make generally available to its securityholders as soon as practicable (which may be satisfied by filing with the Commission's Electronic Data Gathering, Analysis, and Retrieval System), but in any event not later than sixteen months after the effective date of the Registration Statement (as defined in Rule 158(c) under the Act), an earnings statement of the Company and its subsidiaries (which need not be audited) complying with Section 11(a) of the Act and the rules and regulations of the Commission thereunder (including, at the option of the Company, Rule 158);

(g) During the period beginning from the date hereof and continuing until the date that is 45 days after the date of this Agreement, not to, and not to publicly disclose the intention to, without the prior written consent of the Representatives, (i) offer, issue, sell, contract to sell, pledge, grant any option to purchase, make any short sale or otherwise transfer or dispose of, directly or indirectly, or file with the Commission a registration statement under the Act relating to any securities of the Company that are substantially similar to the Securities or the Stock, including but not limited to any securities that are convertible into, exercisable or exchangeable for, or that represent the right to receive, Stock or any such substantially similar securities or (ii) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of the Stock or any such other securities, whether any such transaction is to be settled by delivery of Stock or such other securities, in cash or otherwise other than (A) the Securities, (B) pursuant to the Company's equity incentive plans existing on, or pursuant to the terms of securities convertible, exercisable or exchangeable for Stock or other substantially similar securities of the Company outstanding as of, the date of this Agreement and disclosed in the Pricing Prospectus, (C) pursuant to the terms of securities exercisable for Stock issued after the date of this Agreement pursuant to the Company's equity incentive plans existing on the date of this Agreement and disclosed in the Pricing Prospectus, (D) registration statements on Form S-8 or any successor form or (E) the entry into an agreement providing for the issuance of, or the actual issuance of, shares of Stock or securities that are convertible into, exercisable or exchangeable for, or that represent the right to receive Stock, in connection with one or more license agreements, collaboration agreements or joint ventures; provided that in the case of this clause (E), the aggregate number of shares of Stock that the Company may issue or sell or agree to issue or agree to sell shall not exceed 5% of the total number of shares of Stock issued and outstanding as of the date of this Agreement, and that the Company shall (1) cause each recipient of such securities to execute and deliver to the Representatives, on or prior to the issuance of

such securities, a lock-up agreement in the form attached hereto as Exhibit A covering the remainder of the applicable Lock-up Period (as defined therein), and (2) enter stop transfer instructions with the Company's transfer agent and registrar on such securities, which the Company agrees it will not waive or amend without the prior written consent of the Representatives;

(h) To pay the required Commission filing fees relating to the Securities within the time required by Rule 456(b)(1) under the Act without regard to the proviso therein and otherwise in accordance with Rules 456(b) and 457(r) under the Act;

(i) To use the net proceeds received by the Company from the sale of the Securities pursuant to this Agreement in the manner specified in the Pricing Disclosure Package under the caption "Use of Proceeds";

(j) To use its best efforts to list, subject to notice of issuance, the Securities on Nasdaq;

(k) That the Company and its affiliates will not take, directly or indirectly, any action prohibited by Regulation M under the Exchange Act (other than the Underwriters, as to whom the Company makes no agreement); and

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

6.

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

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

(c) The Company agrees that if at any time following issuance of an Issuer Free Writing Prospectus any event occurred or occurs as a result of which such Issuer Free Writing Prospectus would conflict with the information in the Registration Statement, the Pricing Prospectus or the Prospectus or would include an untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances then prevailing, not misleading, the Company will give prompt notice thereof to the Representatives and, if requested by the Representatives, will prepare and furnish without charge to each Underwriter an Issuer Free Writing Prospectus or other document which will correct such

conflict, statement or omission; provided, however, that this representation and warranty shall not apply to any statements or omissions in an Issuer Free Writing Prospectus made in reliance upon and in conformity with the Underwriter Information.

7. The Company covenants and agrees with the several Underwriters that the Company will pay or cause to be paid the following: (i) the fees, disbursements and expenses of the Company's counsel and accountants in connection with the registration of the Securities under the Act and all other expenses in connection with the preparation, printing, reproduction and filing of the Registration Statement, the Basic Prospectus, any Preliminary Prospectus, any Issuer Free Writing Prospectus and the Prospectus and amendments and supplements thereto and the mailing and delivering of copies thereof to the Underwriters and dealers; (ii) the cost of printing or producing any agreement among Underwriters, this Agreement, any Blue Sky memoranda (subject to the limitations set forth below), closing documents (including any compilations thereof) and any other documents in connection with the offering, purchase, sale and delivery of the Securities; (iii) all reasonable and documented expenses in connection with the qualification of the Securities for offering and sale under state securities laws as provided in Section 5(d) hereof, including the reasonable fees and disbursements of counsel for the Underwriters in connection with such qualification; (iv) the cost of preparing the Securities; (v) the fees and expenses of any transfer agent or registrar; (vi) any cost incurred in connection with the listing of the Securities on Nasdaq; and (vii) all other costs and expenses incident to the performance of its obligations under this Agreement which are not otherwise specifically provided for in this Section (including any transfer taxes on the issuance and sale of the Securities to the Underwriters). It is understood, however, that, except as provided in this Section, and Sections 9 and 12 hereof, the Underwriters will pay all of their own costs and expenses, including the fees of their counsel (other than fees of such counsel plus reasonable disbursements incurred in connection with the preparation, printing and delivery of such Blue Sky memoranda, not to exceed \$7,500), transfer taxes on resale of any of the Securities by them, and any advertising expenses connected with any offers they may make.

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

(a) The Prospectus shall have been filed with the Commission pursuant to Rule 424(b) under the Act within the applicable time period prescribed for such filing by the rules and regulations under the Act and in accordance with Section 5(a) hereof; all material required to be filed by the Company pursuant to Rule 433(d) under the Act shall have been filed with the Commission within the applicable time period prescribed for such filings by Rule 433; no stop order suspending the effectiveness of the Registration Statement or any part thereof shall have been issued and no proceeding for that purpose shall have been initiated or threatened by the Commission and no notice of objection of the Commission to the use of the Registration Statement or any post-effective amendment thereto pursuant to Rule 401(g)(2) under the Act shall have been received; no stop order suspending or preventing the use of the Preliminary Prospectus, Prospectus or any Issuer Free Writing Prospectus shall have been initiated or threatened by the Commission; and all requests for additional information on the part of the Commission shall have been complied with to the Representatives' reasonable satisfaction;

(b) Davis Polk & Wardwell LLP, counsel for the Underwriters, shall have furnished to the Representatives such written opinion or opinions, dated such Time of Delivery, with respect to such matters as the Representatives may reasonably request, and such counsel shall have received such papers and information as they may reasonably request to enable them to pass upon such matters;

(c) Cooley LLP, outside counsel for the Company, shall have furnished to the Representatives their written opinion and negative assurance letters, each dated such Time of Delivery, in form and substance satisfactory to the Representatives:

(d) On the date of the Prospectus at a time prior to the execution of this Agreement, at 9:30 a.m., New York City time, on the effective date of any post-effective amendment to the Registration Statement filed subsequent to the date of this Agreement and also at each Time of Delivery, Ernst & Young LLP shall have furnished to the Representatives a letter or letters, dated the respective dates of delivery thereof, in form and substance reasonably satisfactory to the Representatives, containing statements and information of the type customarily included in accountants' "comfort letters" to underwriters with respect to the historical financial statements and certain financial information contained or incorporated by reference in the Pricing Disclosure Package and the Prospectus;

(e) (i) Neither the Company nor any of its subsidiaries shall have sustained since the date of the latest audited financial statements included or incorporated by reference in the Pricing Disclosure Package any loss or interference with its business from fire, explosion, flood or other calamity, whether or not covered by insurance, or from any labor dispute or court or governmental action, order or decree, otherwise than as set forth or contemplated in the Pricing Disclosure Package, and (ii) since the respective dates as of which information is given in the Pricing Disclosure Package there shall not have been any change in the capital stock (except for (i) changes made in the ordinary course of business consistent with past practice pursuant to the Company's equity incentive plans existing on the date of this Agreement and disclosed in the Pricing Disclosure Package and (ii) changes pursuant to the exercise of options, the vesting of restricted Stock awards or the conversion of the Company's convertible promissory notes, provided that, in each case, such options, restricted Stock awards or convertible promissory notes were outstanding prior to the date of this Agreement and described in the Pricing Disclosure Package) or long-term debt of the Company or any of its subsidiaries or any change or effect, or any development involving a prospective change or effect, in or affecting (x) the business, properties, general affairs, management, financial position, stockholders' equity or results of operations or prospects of the Company and its subsidiaries, taken as a whole, except as set forth or contemplated in the Pricing Disclosure Package, or (y) the ability of the Company to perform its obligations under this Agreement, including the issuance and sale of the Securities, or to consummate the transactions contemplated in the Pricing Disclosure Package and the Prospectus, the effect of which, in any such case described in clause (i) or (ii), is in the Representatives' judgment so material and adverse as to make it impracticable or inadvisable to proceed with the offering or the delivery of the Securities being delivered at such Time of Delivery on the terms and in the manner contemplated in this Agreement and in the Pricing Disclosure Package and the Prospectus;

(f) [Reserved];

(g) On or after the Applicable Time there shall not have occurred any of the following: (i) a suspension or material limitation in trading in securities generally on the New York Stock Exchange or on Nasdaq; (ii) a suspension or material limitation in trading in the Company's

securities on Nasdaq; (iii) a general moratorium on commercial banking activities declared by either Federal, New York or California State authorities or a material disruption in commercial banking or securities settlement or clearance services in the United States; (iv) the outbreak or escalation of hostilities involving the United States or the declaration by the United States of a national emergency or war or (v) the occurrence of any other calamity or crisis or any change in financial, political or economic conditions in the United States or elsewhere, if the effect of any such event specified in clause (iv) or (v) in the Representatives' judgment makes it impracticable or inadvisable to proceed with the public offering or the delivery of the Securities being delivered at such Time of Delivery on the terms and in the manner contemplated in the Pricing Disclosure Package and the Prospectus;

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

(i) The Securities shall have been duly listed, subject to notice of issuance, on Nasdaq;

(j) The Company shall have obtained and delivered to the Underwriters executed copies of a lock-up agreement in the form attached hereto as Exhibit A from each of the parties listed on Schedule I thereto; and

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

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

(b) Each Underwriter will indemnify and hold harmless the Company against any losses, claims, damages or liabilities to which the Company may become subject, under the Act or otherwise, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon an untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, the Basic Prospectus, any Preliminary Prospectus, the Pricing Disclosure Package or the Prospectus, or any amendment or supplement thereto, or any Issuer Free Writing Prospectus, or any road show, or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, in each case to the extent, but only to the extent, that such untrue statement or alleged untrue statement or omission or alleged omission was made in the Registration Statement, the Basic Prospectus, any Preliminary Prospectus, the Pricing Disclosure Package or the Prospectus or any such amendment or supplement thereto, or any Issuer Free Writing Prospectus, or any road show, in reliance upon and in conformity with the Underwriter Information; and will reimburse the Company for any legal or other expenses reasonably incurred by the Company in connection with investigating or defending any such action or claim as such expenses are incurred. As used in this Agreement with respect to an Underwriter and an applicable document, "Underwriter Information" shall mean the written information furnished to the Company by such Underwriter through the Representatives expressly for use therein; it being understood and agreed upon that the only such information furnished by any Underwriter consists of the following information in the Prospectus furnished on behalf of each Underwriter: the selling concession figure appearing in the third paragraph under the caption "Underwriters", and the information contained in the first and second sentences, the fourth through the seventh sentences and the ninth through eleventh sentences of the twelfth paragraph under the caption "Underwriters."

(c) Promptly after receipt by an indemnified party under subsection (a) or (b) above of notice of the commencement of any action, such indemnified party shall, if a claim in respect thereof is to be made against the indemnifying party under such subsection, notify the indemnifying party in writing of the commencement thereof (an "Indemnity Notice"); but the omission so to notify the indemnifying party shall not relieve it from any liability which it may have to any indemnified party otherwise than under such subsection except to the extent such omission shall have actually materially prejudiced the indemnifying party. In case any such action shall be brought against any indemnified party and it shall have provided the indemnifying party an Indemnity Notice, the indemnifying party shall be entitled to participate therein and, to the extent that it shall wish, jointly with any other indemnifying party similarly notified, to assume the defense thereof, with counsel reasonably satisfactory to such indemnified party (who shall not, except with the consent of the indemnified party, be counsel to the indemnifying party), and, after notice from the indemnifying party to such indemnified party of its election so to assume the defense thereof, the indemnifying party shall not be liable to such indemnified party under such subsection for any legal expenses of other counsel or any other expenses, in each case subsequently incurred by such indemnified party, in connection with the defense thereof other than reasonable costs of investigation unless (i) the indemnifying party and the indemnified party shall have mutually agreed to the contrary; (ii) the indemnifying party has failed within a reasonable time to retain counsel reasonably satisfactory to the indemnified party; (iii) the indemnified party shall have reasonably concluded that there may be legal defenses available to it that are different from or in addition to those available to the indemnifying party; or (iv) the named parties in any such proceeding (including any impleaded parties) include both the indemnifying party and the indemnified party and representation of both parties by the same counsel would be inappropriate due to actual or potential differing interest between them. No indemnifying party shall be liable for (or be required to make any contribution with respect to) any settlement of any action or claim effected without its written consent (which consent shall not be unreasonably withheld), but if

settled with the consent of the indemnifying party or if there be a final judgment of the plaintiff in any such action, the indemnifying party agrees to indemnify and hold harmless any indemnified party from and against any loss or liability by reason of such settlement or judgment (including making any required contribution pursuant to this Section 9). No indemnifying party shall, without the written consent of the indemnified party, effect the settlement or compromise of, or consent to the entry of any judgment with respect to, any pending or threatened action or claim in respect of which indemnification or contribution may be sought hereunder (whether or not the indemnified party is an actual or potential party to such action or claim) unless such settlement, compromise or judgment (i) includes an unconditional release of the indemnified party from all liability arising out of such action or claim and (ii) does not include a statement as to, or an admission of, fault, culpability or a failure to act, by or on behalf of any indemnified party.

(d) If the indemnification provided for in this Section 9 is unavailable to or insufficient to hold harmless an indemnified party under subsection (a) or (b) above in respect of any losses, claims, damages or liabilities (or actions in respect thereof) referred to therein, then each indemnifying party shall contribute to the amount paid or payable by such indemnified party as a result of such losses, claims, damages or liabilities (or actions in respect thereof) in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and the Underwriters on the other from the offering of the Securities. If, however, the allocation provided by the immediately preceding sentence is not permitted by applicable law or if the indemnified party failed to give the notice required under subsection (c) above, then each indemnifying party shall contribute to such amount paid or payable by such indemnified party in such proportion as is appropriate to reflect not only such relative benefits but also the relative fault of the Company on the one hand and the Underwriters on the other in connection with the statements or omissions which resulted in such losses, claims, damages or liabilities (or actions in respect thereof), as well as any other relevant equitable considerations. The relative benefits received by the Company on the one hand and the Underwriters on the other shall be deemed to be in the same proportion as the total net proceeds from the offering (before deducting expenses) received by the Company bear to the total underwriting discounts and commissions received by the Underwriters, in each case as set forth in the table on the cover page of the Prospectus. The relative fault shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the Company on the one hand or the Underwriters on the other and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission. The Company and the Underwriters agree that it would not be just and equitable if contribution pursuant to this subsection (d) were determined by pro rata allocation (even if the Underwriters were treated as one entity for such purpose) or by any other method of allocation which does not take account of the equitable considerations referred to above in this subsection (d). The amount paid or payable by an indemnified party as a result of the losses, claims, damages or liabilities (or actions in respect thereof) referred to above in this subsection (d) shall be deemed to include any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any such action or claim. Notwithstanding the provisions of this subsection (d), no Underwriter shall be required to contribute any amount in excess of the amount by which the total price at which the Securities underwritten by it and distributed to investors were offered to investors exceeds the amount of any damages which such Underwriter has otherwise been required to pay by reason of such untrue or alleged untrue statement or omission or alleged omission. No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. The Underwriters' obligations in this subsection (d) to contribute are several in proportion to their respective underwriting obligations and not joint.

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

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

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

(c) If, after giving effect to any arrangements for the purchase of the Securities of a defaulting Underwriter or Underwriters by the Representatives and the Company as provided in subsection (a) above, the aggregate number of such Securities which remains unpurchased exceeds one eleventh of the aggregate number of all the Securities to be purchased at such Time of Delivery, or if the Company shall not exercise the right described in subsection (b) above to require non-defaulting Underwriters to purchase Securities of a defaulting Underwriter or Underwriters, then this Agreement (or, with respect to a Subsequent Time of Delivery, the obligation of the Underwriters to purchase and of the Company to sell the Optional Securities) shall thereupon terminate, without liability on the part of any non-defaulting Underwriter or the

Company, except for the expenses to be borne by the Company and the Underwriters as provided in Section 7 hereof and the indemnity and contribution agreements in Section 9 hereof; but nothing herein shall relieve a defaulting Underwriter from liability for its default.

11. The respective indemnities, rights of contribution, agreements, representations, warranties and other statements of the Company and the several Underwriters, as set forth in this Agreement or made by or on behalf of them, respectively, pursuant to this Agreement, shall remain in full force and effect, regardless of any investigation (or any statement as to the results thereof) made by or on behalf of any Underwriter or any director, officer affiliate or controlling person of any Underwriter, or the Company, or any officer or director or controlling person of the Company, and shall survive delivery of and payment for the Securities.

12. If this Agreement shall be terminated pursuant to Section 10 hereof, the Company shall not then be under any liability to any Underwriter except as provided in Sections 7 and 9 hereof; but, if for any other reason, any of the Securities are not delivered by or on behalf of the Company as provided herein (a) on the First Time of Delivery, the Company will reimburse the Underwriters through the Representatives for all expenses approved in writing by the Representatives, including fees and disbursements of counsel, reasonably incurred by the Underwriters in making preparations for the purchase, sale and delivery of the Securities not so delivered, and (b) after the First Time of Delivery, the Company will reimburse the Underwriters through the Representatives for all expenses approved in writing by the Representatives, including fees and disbursements of counsel, reasonably incurred by the Underwriters solely in making preparations for the purchase, sale and delivery of the Optional Securities relating to the applicable Subsequent Time of Delivery, but in each case the Company shall then be under no further liability to any Underwriter except as provided in Sections 7 and 9 hereof.

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

All statements, requests, notices and agreements hereunder shall be in writing, and if to the Underwriters shall be delivered or sent by mail or facsimile transmission to the Representatives in care of Morgan Stanley & Co. LLC, 1585 Broadway, 29th Floor, New York, New York 10036, Attention: Investment Banking Division (fax: (212) 507-8999), and Goldman Sachs & Co. LLC, 200 West Street, New York, New York 10282, Attention: Registration Department (fax: (212) 902-9316) (email: registration-syndops@ny.email.gs.com); and if to the Company shall be delivered or sent by mail or facsimile transmission to the address of the Company set forth in the Registration Statement, Attention: Chief Financial Officer (with a copy via facsimile transmission to General Counsel at (760) 268-4922); provided, however, that any notice to an Underwriter pursuant to Section 9(c) hereof shall be delivered or sent by mail or facsimile transmission to such Underwriter at its address set forth in its Underwriters' Questionnaire, which address will be supplied to the Company by the Representatives upon request. Any such statements, requests, notices or agreements shall take effect upon receipt thereof.

In accordance with the requirements of the USA Patriot Act (Title III of Pub. L. 107-56 (signed into law October 26, 2001)), the Underwriters are required to obtain, verify and record information that identifies their respective clients, including the Company, which information may include the name and address of their respective clients, as well as other information that will allow the Underwriters to properly identify their respective clients.

14. This Agreement shall be binding upon, and inure solely to the benefit of, the Underwriters, the Company and, to the extent provided in Sections 9 and 11 hereof, the officers and directors of the Company and each person who controls the Company or any Underwriter or any director, officer or affiliate of any Underwriter, and their respective heirs, executors, administrators, successors and assigns, and no other person shall acquire or have any right under or by virtue of this Agreement. No purchaser of any of the Securities from any Underwriter shall be deemed a successor or assign by reason merely of such purchase.

15. Time shall be of the essence of this Agreement.

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

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

18. This Agreement and any transaction contemplated by this Agreement shall be governed by and construed in accordance with the laws of the State of New York without regard to principles of conflict of laws that would result in the application of any other law than the laws of the State of New York. The Company agrees that any suit or proceeding arising in respect of this Agreement or any transaction contemplated by this Agreement will be tried exclusively in the U.S. District Court for the Southern District of New York or, if that court does not have subject matter jurisdiction, in any state court located in The City and County of New York and the Company agrees to submit to the jurisdiction of, and to venue in, such courts.

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

20. This Agreement may be executed by any one or more of the parties hereto in any number of counterparts, each of which shall be deemed to be an original, but all such respective counterparts shall together constitute one and the same instrument. This Agreement may be delivered via facsimile, electronic mail (including pdf or any electronic signature complying with the U.S. federal ESIGN Act of 2000, Uniform Electronic Transactions Act or other applicable law, e.g., www.docusign.com or www.echosign.com) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

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

22. Recognition of the U.S. Special Resolution Regimes.

(a) In the event that any Underwriter that is a Covered Entity becomes subject to a proceeding under a U.S. Special Resolution Regime, the transfer from such Underwriter of this Agreement, and any interest and obligation in or under this Agreement, will be effective to the same extent as the transfer would be effective under the U.S. Special Resolution Regime if this Agreement, and any such interest and obligation, were governed by the laws of the United States or a state of the United States.

(b) In the event that any Underwriter that is a Covered Entity or a BHC Act Affiliate of such Underwriter becomes subject to a proceeding under a U.S. Special Resolution Regime, Default Rights under this Agreement that may be exercised against such Underwriter are permitted to be exercised to no greater extent than such Default Rights could be exercised under the U.S. Special Resolution Regime if this Agreement were governed by the laws of the United States or a state of the United States.

(c) As used in this section:

"BHC Act Affiliate" has the meaning assigned to the term "affiliate" in, and shall be interpreted in accordance with, 12 U.S.C. § 1841(k).

"Covered Entity" means any of the following:

(i) a "covered entity" as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 252.82(b);

(ii) a "covered bank" as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 47.3(b); or

(iii) a "covered FSI" as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 382.2(b).

"Default Right" has the meaning assigned to that term in, and shall be interpreted in accordance with, 12 C.F.R. §§ 252.81, 47.2 or 382.1, as applicable.

"U.S. Special Resolution Regime" means each of (i) the Federal Deposit Insurance Act and the regulations promulgated thereunder and (ii) Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act and the regulations promulgated thereunder.

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

Very truly yours,

Ionis Pharmaceuticals, Inc.

By: /s/ Elizabeth L. Hougen

Name: Elizabeth L. Hougen

Title: CFO

Accepted as of the date hereof:

Morgan Stanley & Co. LLC, on behalf of each of the Underwriters

By: /s/ Kalli Dircks

Name: Kalli Dircks

Title: Managing Director

Goldman Sachs & Co. LLC, on behalf of each of the Underwriters

By: /s/ Lyla Bibi Maduri

Name: Lyla Bibi Maduri

Title: Managing Director

[Signature Page to Underwriting Agreement]

SCHEDULE I

	<u>Underwriter</u>	<u>Total Number of Firm Securities to be Purchased</u>	<u>Maximum Number of Optional Securities to be Purchased</u>
Morgan Stanley & Co. LLC		5,750,000	862,500
Goldman Sachs & Co. LLC		5,750,000	862,500
Total		<u>11,500,000</u>	<u>1,725,000</u>

Sch I-1

SCHEDULE II

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

Electronic road show dated September 9, 2024

(b) Additional Documents Incorporated by Reference:

None

(c) Information other than the Pricing Prospectus that comprise the Pricing Disclosure Package:

The public offering price per share for the Securities is \$43.50.

The number of Firm Securities purchased by the Underwriters is 11,500,000.

The number of Optional Securities to be potentially sold by the Company is up to 1,725,000.

Sch II-1

Exhibit A

Form of Lock-Up Agreement

A-Sch I-1



Charles S. Kim
T: +1 858 550 6049
ckim@cooley.com

September 11, 2024

Ionis Pharmaceuticals, Inc.
2855 Gazelle Court
Carlsbad, California 92010

Ladies and Gentlemen:

We have acted as counsel to Ionis Pharmaceuticals, Inc., a Delaware corporation (the “*Company*”), in connection with the offering by the Company of up to 13,225,000 shares of the Company’s common stock, par value \$0.001 (the “*Shares*”), including up to 1,725,000 Shares that may be sold pursuant to the exercise of an option to purchase additional Shares, pursuant to a Registration Statement on Form S-3 (Registration Statement No. 333-275741) (the “*Registration Statement*”), filed with the Securities and Exchange Commission (the “*Commission*”) under the Securities Act of 1933, as amended (the “*Securities Act*”), the prospectus included in the Registration Statement (the “*Base Prospectus*”), and the prospectus supplement relating to the Shares dated September 9, 2024 and filed with the Commission pursuant to Rule 424(b) under the Act (together with the Base Prospectus, the “*Prospectus*”).

In connection with this opinion, we have examined and relied upon the Registration Statement, the Prospectus, the Company’s certificate of incorporation and bylaws, each as currently in effect, and such other records, documents, certificates, memoranda and other instruments as in our judgment are necessary or appropriate to enable us to render the opinion expressed below. We have assumed the genuineness of all signatures; the authenticity of all documents submitted to us as originals; the conformity to originals of all documents submitted to us as copies, the accuracy, completeness and authenticity of certificates of public officials; and the due authorization, execution and delivery of all documents by all persons other than the Company where authorization, execution and delivery are prerequisites to the effectiveness thereof. As to certain factual matters, we have relied upon a certificate of an officer of the Company and have not independently verified such matters.

Our opinion herein is expressed solely with respect to the General Corporation Law of the State of Delaware. We express no opinion to the extent that any other laws are applicable to the subject matter hereof and express no opinion and provide no assurance as to compliance with any federal or state securities law, rule or regulation.

On the basis of the foregoing, and in reliance thereon, we are of the opinion that the Shares, when sold and issued in accordance with the Registration Statement and the Prospectus, will be validly issued, fully paid and non-assessable.

This opinion is limited to the matters expressly set forth in this letter, and no opinion has been or should be implied, or may be inferred, beyond the matters expressly stated. This opinion speaks only as to law and facts in effect or existing as of the date hereof and we have no obligation or responsibility to update or supplement this letter to reflect any facts or circumstances that may hereafter come to our attention or any changes in law that may hereafter occur.

We consent to the reference to our firm under the heading “Legal Matters” in the Prospectus and to the filing of this opinion as an exhibit to a Current Report on Form 8-K to be filed with the Commission for incorporation by reference into the Registration Statement. 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 Securities Act, or the rules and regulations of the Commission thereunder.

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T: +1 858 550-6000 F: +1 858 550 6420 COOLEY.COM

September 11, 2024

Page Two

Very truly yours,

Cooley LLP

By: /s/ Charles S. Kim

Charles S. Kim

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