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**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**  
Washington, D.C. 20549

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**FORM 8-K**

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**CURRENT REPORT**

**Pursuant to Section 13 or 15(d)  
of the Securities Exchange Act of 1934**  
**December 12, 2018**  
**Date of Report (Date of earliest event reported)**

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**Tocagen Inc.**

(Exact name of registrant as specified in its charter)

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**Delaware**  
(State or other jurisdiction  
of incorporation)

**001-38052**  
(Commission  
File Number)

**26-1243872**  
(IRS Employer  
Identification No.)

**4242 Campus Point Court, Suite 500**  
**San Diego, California**  
(Address of principal executive offices)

**92121**  
(Zip Code)

**Registrant's telephone number, including area code: (858) 412-8400**

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

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

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

Emerging growth company

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

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## Item 8.01 Other Events.

On December 12, 2018, Tocagen Inc. (“Tocagen”) entered into an Underwriting Agreement (the “Underwriting Agreement”) with Citigroup Global Markets Inc. and Leerink Partners LLC, as representatives of the several underwriters named therein (the “Underwriters”), relating to the offering, issuance and sale (the “Offering”) of 3,000,000 shares of Tocagen’s common stock, \$0.001 par value per share (the “Common Stock”), at a price to the public of \$10.00 per share, which Tocagen estimates will result in approximately \$27.9 million of net proceeds to Tocagen after deducting the underwriting discounts and commissions and estimated offering expenses. The Offering is expected to close on or about December 17, 2018, subject to the satisfaction of customary closing conditions. In addition, the Underwriters have a 30-day option to purchase up to an additional 450,000 shares of Common Stock. All of the shares in the Offering are being sold by Tocagen.

The Offering is being made pursuant to Tocagen’s effective shelf registration statement on Form S-3 (Registration No. 333-224880) previously filed with the Securities and Exchange Commission, as supplemented by a preliminary prospectus supplement dated December 12, 2018 and a final prospectus supplement dated December 12, 2018.

The Underwriting Agreement contains customary representations, warranties, covenants and agreements by Tocagen, conditions to closing, indemnification obligations of Tocagen 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 the contracting parties.

The Underwriting Agreement is filed as Exhibit 1.1 hereto and is incorporated herein by reference. The foregoing description of the terms of the Underwriting Agreement is qualified in its entirety by reference to such exhibit.

A copy of the opinion of Cooley LLP relating to the legality of the issuance and sale of the shares in the Offering is attached as Exhibit 5.1 hereto.

On December 11, 2018, we issued a press release announcing the commencement of the Offering, and on December 12, 2018, we issued a press release announcing that we had priced the Offering. Copies of these press releases are attached as Exhibits 99.1 and 99.2 hereto, respectively.

## Item 9.01 Financial Statements and Exhibits.

(d) Exhibits.

<b>Exhibit Number</b>	<b>Description</b>
1.1	<a href="#"><u>Underwriting Agreement, dated December 12, 2018, by and among Tocagen Inc. and Citigroup Global Markets Inc. and Leerink Partners LLC, as representatives for the several underwriters.</u></a>
5.1	<a href="#"><u>Opinion of Cooley LLP.</u></a>
23.1	<a href="#"><u>Consent of Cooley LLP (included in Exhibit 5.1).</u></a>
99.1	<a href="#"><u>Press Release, dated December 11, 2018.</u></a>
99.2	<a href="#"><u>Press Release, dated December 12, 2018.</u></a>

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**Forward-Looking Statements**

Certain statements in this report that are not historical facts are forward-looking statements that involve a number of risks and uncertainties. Such forward-looking statements include statements relating to the closing of the Offering and the expected net proceeds to Tocagen from the Offering. These statements are only predictions based on current information and expectations and involve a number of risks and uncertainties. Actual events or results may differ materially from those stated in any such statements due to various factors, including uncertainties related to the satisfaction of customary closing conditions, as well as those discussed in the section captioned "Risk Factors" in Tocagen's filings with the Securities and Exchange Commission, including without limitation in its Form 10-K for the year ended December 31, 2017 and in its subsequent Form 10-Qs. You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof. This caution is made under the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. All forward-looking statements are qualified in their entirety by this cautionary statement and Tocagen undertakes no obligation to revise or update this report to reflect events or circumstances after the date hereof.

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SIGNATURES

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

**Tocagen Inc.**

Dated: December 13, 2018

By: /s/ Mark Foletta

Mark Foletta

Executive Vice President, Chief Financial Officer

Tocagen Inc.

3,000,000 Shares  
Common Stock  
(\$0.001 par value)

Underwriting Agreement

New York, New York  
December 12, 2018

Citigroup Global Markets Inc.  
Leerink Partners LLC  
As Representatives of the several Underwriters,

c/o Citigroup Global Markets Inc.  
388 Greenwich Street  
New York, New York 10013

c/o Leerink Partners LLC  
One Federal Street, 37th Floor  
Boston, Massachusetts 02110

Ladies and Gentlemen:

Tocagen Inc., a corporation organized under the laws of Delaware (the “Company”), proposes to sell to the several underwriters named in Schedule II hereto (the “Underwriters”), for whom you (the “Representatives”) are acting as representatives, the number of shares of common stock, \$0.001 par value (“Common Stock”), of the Company set forth in Schedule I hereto (said shares to be issued and sold by the Company being hereinafter called the “Underwritten Securities”). The Company also proposes to grant to the Underwriters an option to purchase up to the number of additional shares of Common Stock set forth in Schedule I hereto (the “Option Securities,” the Option Securities, together with the Underwritten Securities, being hereinafter called the “Securities”). To the extent there are no additional Underwriters listed on Schedule II other than you, the term Representatives as used herein shall mean you, as Underwriters, and the terms Representatives and Underwriters shall mean either the singular or plural as the context requires.

As used in this underwriting agreement (this “Agreement”), the “Registration Statement” means the registration statement referred to in paragraph 1(a) hereof, including the exhibits, schedules and financial statements and any prospectus supplement relating to the Securities that is filed with the Securities and Exchange Commission (the “SEC”) pursuant to Rule 424(b) under the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder (the “Securities Act”) and deemed part of such registration statement pursuant to Rule 430B under the Securities Act, as amended on each Effective Date, and, in the

event any post-effective amendment thereto or any registration statement and any amendments thereto filed pursuant to Rule 462(b) under the Securities Act (a “Rule 462(b) Registration Statement”) becomes effective prior to the Closing Date (as defined in Section 3 hereof), shall also mean such registration statement as so amended or such Rule 462(b) Registration Statement, as the case may be; the “Effective Date” means each date and time that the Registration Statement, any post-effective amendment or amendments thereto or any Rule 462(b) Registration Statement became or becomes effective; the “Base Prospectus” means the base prospectus referred to in paragraph 1(a) hereof contained in the Registration Statement at the date and time that this Agreement is executed and delivered by the parties hereto (the “Execution Time”); the “Preliminary Prospectus” means any preliminary prospectus supplement to the Base Prospectus referred to in paragraph 1(a) hereof which is used prior to the filing of the Final Prospectus, together with the Base Prospectus; and the “Final Prospectus” means the prospectus supplement relating to the Securities that is first filed pursuant to Rule 424(b) under the Securities Act (“Rule 424(b)”) after the Execution Time, together with the Base Prospectus.

Any reference herein to the Registration Statement, the Base Prospectus, any Preliminary Prospectus or the Final Prospectus shall be deemed to refer to and include the documents incorporated by reference therein pursuant to Item 12 of Form S-3 which were filed under the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder (the “Exchange Act”) on or before the Effective Date of the Registration Statement or the issue date of the Base Prospectus, any Preliminary Prospectus or the Final Prospectus, as the case may be; and any reference herein to the terms “amend,” “amendment” or “supplement” with respect to the Registration Statement, the Base Prospectus, any Preliminary Prospectus or the Final Prospectus shall be deemed to refer to and include the filing of any document under the Exchange Act after the Effective Date of the Registration Statement or the issue date of the Base Prospectus, any Preliminary Prospectus or the Final Prospectus, as the case may be, deemed to be incorporated therein by reference.

As used in this Agreement, the “Disclosure Package” shall mean (i) the Base Prospectus, (ii) the Preliminary Prospectus used most recently prior to the Execution Time, (iii) any issuer free writing prospectus, as defined in Rule 433 under the Securities Act (an “Issuer Free Writing Prospectus”), identified in Schedule III hereto, and (iv) any other free writing prospectus, as defined in Rule 405 under the Securities Act (a “Free Writing Prospectus”), that the parties hereto shall hereafter expressly agree in writing to treat as part of the Disclosure Package.

1. Representations and Warranties. The Company represents and warrants to, and agrees with, each Underwriter as set forth below in this Section 1.

(a) The Company meets the requirements for use of Form S-3 under the Securities Act and has prepared and filed with the SEC a registration statement (File Number 333-224880) on Form S-3, including a related Base Prospectus, for registration under the Securities Act of the offering and sale of the Securities. Such Registration Statement, including any amendments thereto filed prior to the Execution Time, has become effective. The Company has filed or will file with the SEC the Final Prospectus relating to the Securities in accordance with Rule 424(b). As filed, the Final Prospectus

shall contain all information required by the Securities Act and the rules thereunder, and, except to the extent the Representatives shall agree in writing to a modification, shall be in all substantive respects in the form furnished to the Representatives prior to the Execution Time or, to the extent not completed at the Execution Time, shall contain only such specific additional information and other changes (beyond that contained in the Base Prospectus and any Preliminary Prospectus) as the Company has advised you, prior to the Execution Time, will be included or made therein. The Registration Statement, at the Execution Time, meets the requirements set forth in Rule 415(a)(1)(x) under the Securities Act. The initial Effective Date of the Registration Statement was not earlier than the date three years before the Execution Time.

(b) On each Effective Date, the Registration Statement did, and when the Final Prospectus is first filed in accordance with Rule 424(b) and on the Closing Date (as defined herein) and on any date on which Option Securities are purchased, if such date is not the Closing Date (a “settlement date”), the Final Prospectus (and any supplement thereto) will, comply in all material respects with the applicable requirements of the Securities Act and the Exchange Act and the respective rules thereunder; on each Effective Date, at the Execution Time and on the Closing Date, the Registration Statement did not and will not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make the statements therein not misleading; and on the date of any filing pursuant to Rule 424(b) and on the Closing Date and any settlement date, the Final Prospectus (together with any supplement thereto) will not include any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided, however, that the Company makes no representations or warranties as to the information contained in or omitted from the Registration Statement or the Final Prospectus (or any supplement thereto) in reliance upon and in conformity with information furnished in writing to the Company by or on behalf of any Underwriter through the Representatives specifically for inclusion in the Registration Statement or the Final Prospectus (or any supplement thereto), it being understood and agreed that the only such information furnished by any Underwriter consists of the information described as such in Section 8 hereof.

(c) (i) The Disclosure Package and the price to the public, the number of Underwritten Securities and the number of Option Securities to be included on the cover page of the Final Prospectus, when taken together as a whole, and (ii) each electronic road show, when taken together as a whole with the Disclosure Package and the price to the public, the number of Underwritten Securities and the number of Option Securities to be included on the cover page of the Final Prospectus, does not contain 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. The preceding sentence does not apply to statements in or omissions from the Disclosure Package based upon and in conformity with written information furnished to the Company by any Underwriter through the Representatives specifically for use therein, it being understood and agreed that the only such information furnished by or on

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behalf of any Underwriter consists of the information described as such in Section 8 hereof.

(d) (i) 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)) of the Securities and (ii) as of the Execution Time (with such date being used as the determination date for purposes of this clause (ii)), the Company was not and is not an Ineligible Issuer (as defined in Rule 405), without taking account of any determination by the SEC pursuant to Rule 405 that it is not necessary that the Company be considered an Ineligible Issuer.

(e) From the time of filing of the Registration Statement through the Execution Time, the Company has been and is an “emerging growth company,” as defined in Section 2(a) of the Securities Act.

(f) Each Issuer Free Writing Prospectus does not include any information that conflicts with the information contained in the Registration Statement, including any document incorporated therein by reference and any prospectus supplement deemed to be a part thereof that has not been superseded or modified. The foregoing sentence does not apply to statements in or omissions from any Issuer Free Writing Prospectus based upon and in conformity with written information furnished to the Company by any Underwriter through the Representatives specifically for use therein, it being understood and agreed that the only such information furnished by or on behalf of any Underwriter consists of the information described as such in Section 8 hereof.

(g) The Registration Statement is not the subject of a pending proceeding or examination under Section 8(d) or 8(e) of the Securities Act, and the Company is not the subject of a pending proceeding under Section 8A of the Securities Act in connection with the offering of the Securities.

(h) The Common Stock is an “actively-traded security” exempted from the requirements of Rule 101 of Regulation M under the Exchange Act by subsection (c)(1) of such rule.

(i) The interactive data in the eXtensible Business Reporting Language included as an exhibit to the Registration Statement or the documents incorporated by reference therein fairly presents the information called for in all material respects and has been prepared in accordance with the SEC’s rules and guidelines applicable thereto.

(j) The financial statements of the Company (including all notes and schedules thereto) included or incorporated by reference in the Registration Statement, the Preliminary Prospectus and the Final Prospectus, present fairly, in all material respects, the financial position of the Company and its consolidated subsidiaries at the dates indicated and the statement of operations, stockholders’ equity and cash flows of the Company and its consolidated subsidiaries for the periods specified; and such financial statements and related schedules and notes thereto, and the unaudited financial

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information filed with the SEC as part of the Registration Statement, have been prepared in conformity with generally accepted accounting principles, consistently applied throughout the periods involved (provided that non-year-end financial statements are subject to normal recurring year-end audit adjustments that are not expected to be material in the aggregate and do not contain all footnotes required by generally accepted accounting principles); and the supporting schedules included or incorporated by reference in the Registration Statement present fairly the information required to be stated therein. The selected financial data included in the Preliminary Prospectus and the Final Prospectus present fairly, in all material respects, the information shown therein as at the respective dates and for the respective periods specified and have been presented on a basis consistent with the consolidated financial statements set forth in the Preliminary Prospectus and the Final Prospectus and other financial information.

(k) There has not occurred any material adverse change in the condition, financial or otherwise, or in the earnings, business or operations or prospects of the Company, from that set forth in the Disclosure Package and the Final Prospectus (exclusive of any amendments or supplements thereto subsequent to the date of this Agreement).

(l) Ernst & Young LLP, whose reports are filed with the SEC as a part of the Registration Statement, is and, during the periods covered by its reports, was an independent registered public accounting firm as required by the Securities Act.

(m) The Company and each of its subsidiaries is duly organized, validly existing and in good standing under the laws of their respective jurisdictions of incorporation or organization. The Company and each of its subsidiaries is duly qualified to do business and is in good standing as a foreign corporation in each jurisdiction in which the nature of the business conducted by it or location of the assets or properties owned, leased or licensed by it requires such qualification, except for such jurisdictions where the failure to so qualify or be in good standing, individually or in the aggregate, would not reasonably be expected to have a material adverse effect on the assets, properties, condition, financial or otherwise, or in the results of operations or business affairs or business prospects of the Company and its subsidiaries considered as a whole (a “Material Adverse Effect”); and to the Company’s knowledge, no proceeding has been instituted in any such jurisdiction revoking, limiting or curtailing, or seeking to revoke, limit or curtail, such power and authority or qualification.

(n) Except as set forth in the Disclosure Package and the Final Prospectus, the Company and each of its subsidiaries has all requisite corporate power and authority, and all necessary authorizations, exemptions, approvals, consents, orders, licenses, registrations, certificates and permits of and from all governmental or regulatory bodies or any other person or entity (collectively, the “Permits”), to own, lease and license its assets and properties and conduct its business, all of which are valid and in full force and effect, except where the lack of such Permits, individually or in the aggregate, would not reasonably be expected to have a Material Adverse Effect. The Company and each of its subsidiaries has fulfilled and performed in all material respects all of its material

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obligations with respect to such Permits and, to the Company's knowledge, no event has occurred that allows, or after notice or lapse of time would allow, revocation or termination thereof or results in any other material impairment of the rights of the Company thereunder. Except as may be required under the Securities Act and state and foreign Blue Sky laws, no other Permits are required to enter into, deliver and perform this Agreement and to issue and sell the Securities. All of the descriptions in the Registration Statement, the Disclosure Package and the Final Prospectus of the legal and governmental procedures and requirements of the United States Food and Drug Administration (the "FDA") or any foreign, state or local governmental body exercising comparable authority are accurate in all material respects.

(o) Except as set forth in the Disclosure Package and the Final Prospectus, the Company owns or has valid, binding and enforceable licenses or other rights under the patents, patent applications, licenses, inventions, copyrights, know how (including trade secrets and other unpatented and/or unpatentable proprietary or confidential information, systems or procedures), trademarks, service marks, trade names or other intellectual property (collectively, "Intellectual Property") reasonably necessary for, or used in the conduct, or the proposed conduct, of the business of the Company in the manner described in the Registration Statement, the Disclosure Package and the Final Prospectus; the patents, trademarks, and copyrights, if any, included within the Intellectual Property owned or licensed by the Company (the "Company Intellectual Property") are valid, enforceable, and subsisting; other than as disclosed in the Registration Statement, the Disclosure Package and the Final Prospectus, (i) the Company is not obligated to pay a material royalty, grant a license to, or provide other material consideration to any third party in connection with the Company Intellectual Property, (ii) the Company has not received any notice of any claim of infringement, misappropriation or conflict with any asserted rights of others with respect to any of the Company's product candidates, services, processes or the Company Intellectual Property, other than those that, singly or in the aggregate, would not reasonably be expected to result in a Material Adverse Effect, (iii) to the knowledge of the Company, neither the sale nor use of any of the discoveries, inventions, product candidates, services or processes of the Company referred to in the Registration Statement, the Disclosure Package or the Final Prospectus do or will, to the knowledge of the Company, infringe, misappropriate or violate any right or valid patent claim of any third party, (iv) none of the technology employed by the Company has been obtained or is being used by the Company in material violation of any contractual obligation binding on the Company or, to the Company's knowledge, upon any of its officers, directors or employees or otherwise in violation of the rights of any persons, (v) each person who is or was an employee or contractor of the Company and who is or was involved in the creation or development of any Company Intellectual Property has signed an agreement containing an assignment to the Company of such person's rights in and to such Company Intellectual Property, (vi) to the knowledge of the Company, no third party has any ownership right in or to any Intellectual Property that is claimed to be owned by the Company, other than any co-owner of any patent constituting Intellectual Property who is listed on the records of the U.S. Patent and Trademark Office (the "USPTO") or any

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foreign or international patent authority and any co-owner of any patent application constituting Intellectual Property who is named in such patent application, and, to the knowledge of the Company, no third party has any ownership right in or to any Intellectual Property in any field of use that is exclusively licensed to the Company, other than any licensor to the Company of such Intellectual Property, (vii) there is no material infringement by third parties of any Company Intellectual Property, (viii) there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the Company's rights in or to the Company Intellectual Property, and (ix) there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the validity or scope of any Company Intellectual Property. The Company is in compliance in all material respects with the terms of each agreement pursuant to which Intellectual Property has been licensed to the Company, and all such agreements are in full force and effect.

(p) All patents and patent applications owned by or licensed to the Company or under which the Company has rights have, to the knowledge of the Company, been duly and properly filed and maintained in all material respects; to the knowledge of the Company, the parties prosecuting such patent applications have complied with their duty of candor and disclosure to the USPTO or any foreign or international patent authority in connection with such applications; and the Company is not aware of any facts required to be disclosed to the USPTO or any foreign or international patent authority that were not disclosed to the USPTO or any foreign or international patent authority and which would preclude the grant of a patent in connection with any such application or would reasonably be expected to form the basis of a finding of invalidity with respect to any patents that have issued with respect to such applications.

(i) The Company and each of its subsidiaries has good and marketable title in fee simple to all real property owned by it, and good and marketable title to all personal property owned by it, in each case free and clear of all liens, encumbrances and defects, except as are described in the Disclosure Package and the Final Prospectus or such as do not materially affect the value of such property and do not materially interfere with the use made or proposed to be made of such property by the Company and its subsidiaries. All property held under lease by the Company and its subsidiaries is held by them under valid, existing and enforceable leases, with only such exceptions as are not material and do not materially interfere with the use made or proposed to be made of such property by the Company and its subsidiaries. Subsequent to the respective dates as of which information is given in the Registration Statement, the Disclosure Package and the Final Prospectus, (i) there has not been any Material Adverse Effect; (ii) neither the Company nor any of its subsidiaries has sustained any loss or interference with its assets, businesses or properties (whether owned or leased) from fire, explosion, earthquake, flood or other calamity, whether or not covered by insurance, or from any labor dispute or any court or legislative or other governmental action, order or decree which would reasonably be expected to have a Material Adverse Effect; and (iii) since the date of the latest balance sheet included or incorporated by reference in the Registration Statement, the Disclosure Package and the Final Prospectus, except as otherwise disclosed in the Disclosure Package and the Final Prospectus, neither the Company nor its subsidiaries has (A) incurred any liability or

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obligation, direct or contingent, for borrowed money, except such liabilities or obligations incurred in the ordinary course of business, (B) entered into any transaction not in the ordinary course of business or (C) declared or paid any dividend or made any distribution on any shares of its stock or redeemed, purchased or otherwise acquired or agreed to redeem, purchase or otherwise acquire any shares of its capital stock.

(q) There is no document, contract or other agreement required to be described in the Registration Statement, the Disclosure Package or the Final Prospectus or to be filed as an exhibit to the Registration Statement which is not described or filed as required by the Securities Act or incorporated therein by reference as permitted by the Securities Act. Each description of a contract, document or other agreement in the Registration Statement, the Disclosure Package and the Final Prospectus accurately reflects in all material respects the terms of the underlying contract, document or other agreement. Each contract, document or other agreement described in the Registration Statement, the Disclosure Package or the Final Prospectus or listed in the exhibits to the Registration Statement or incorporated by reference is in full force and effect and is valid and enforceable by and against the Company or any of its subsidiaries, as the case may be, in accordance with its terms. Neither the Company nor any of its subsidiaries, if a subsidiary is a party, nor to the Company's knowledge, any other party, is in default in the observance or performance of any term or obligation to be performed by it under any such agreement, and no event has occurred which with notice or lapse of time or both would constitute such a default, in any such case which default or event, individually or in the aggregate, would reasonably be expected to have a Material Adverse Effect. No default exists, and no event has occurred which with notice or lapse of time or both would constitute a default, in the due performance and observance of any term, covenant or condition, by the Company or its subsidiaries, if a subsidiary is a party thereto, of any other agreement or instrument to which the Company or any of its subsidiaries is a party or by which the Company or its properties or business of a subsidiary or its properties or business may be bound or affected which default or event, individually or in the aggregate, would reasonably be expected to have a Material Adverse Effect.

(r) The scientific (other than the Company's clinical trial results), statistical and market related data included in the Registration Statement, the Disclosure Package and the Final Prospectus are based on or derived from sources that are credible and which the Company believes to be reliable and accurate.

(s) Neither the Company nor any of its subsidiaries is in violation of any term or provision of (i) its charter or by-laws or (ii) of any franchise, license, permit, judgment, decree, order, statute, rule or regulation, except, with respect to subsection (ii), where the consequences of such violation, individually or in the aggregate, would not reasonably be expected to have a Material Adverse Effect.

(t) This Agreement has been duly and validly authorized, executed and delivered by the Company.

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(u) Neither the execution, delivery and performance of this Agreement by the Company nor the consummation of any of the transactions contemplated hereby by the Company (including, without limitation, the issuance and sale by the Company of the Securities) will give rise to a right to terminate or accelerate the due date of any payment due under, or conflict with or result in the breach of any term or provision of, or constitute a default (or an event which with notice or lapse of time or both would constitute a default) under, or require any consent or waiver under, or result in the execution or imposition of any lien, charge or encumbrance upon any properties or assets of the Company or its subsidiaries pursuant to the terms of, any indenture, mortgage, deed of trust or other agreement or instrument to which the Company or any of its subsidiaries is a party or by which either the Company or its subsidiaries or any of their properties or businesses is bound, or any franchise, license, permit, judgment, decree, order, statute, rule or regulation applicable to the Company or any of its subsidiaries, except as disclosed in the Disclosure Package and the Final Prospectus or where it would not reasonably be expected to have a Material Adverse Effect, or violate any provisions of the charter or by-laws of the Company or any of its subsidiaries, except for such consents or waivers which have already been obtained and are in full force and effect.

(v) The Company had the authorized and outstanding capital stock as set forth in the Registration Statement, the Disclosure Package and the Final Prospectus as of the dates for which such information is given therein. All of the issued and outstanding shares of Common Stock have been duly and validly issued and are fully paid and nonassessable. There are no statutory preemptive or other similar rights granted by the Company to subscribe for or to purchase or acquire any shares of Common Stock of the Company or any of its subsidiaries or any such rights pursuant to its charter or by-laws or any agreement or instrument to or by which the Company or any of its subsidiaries is a party or bound. All grants of options to acquire Common Stock (each, a "Company Stock Option") were validly issued and approved by the Board of Directors of the Company (the "Board"), a committee thereof or an individual with authority duly delegated by the Board or a committee thereof. Grants of Company Stock Options were (i) made in material compliance with all applicable laws and (ii) as a whole, made in material compliance with the terms of the plans under which such Company Stock Options were issued. There is no and has been no policy or practice of the Company to coordinate the grant of Company Stock Options 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 Company Stock Options. The Securities, when issued and sold pursuant to this Agreement, will be duly and validly issued, fully paid and nonassessable and none of them will be issued in violation of any preemptive or other similar right granted by the Company. Except as disclosed in the Registration Statement, the Disclosure Package and the Final Prospectus, there is no outstanding option, warrant or other right calling for the issuance by the Company of, and there is no commitment, plan or arrangement by the Company to issue, any share of stock of the Company or any security convertible into, or exercisable or exchangeable for, such stock. The Common Stock and the Securities conform in all material respects to all statements in relation thereto contained in the Registration Statement, the Disclosure

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Package and the Final Prospectus. All outstanding shares of capital stock of each of the Company's subsidiaries have been duly authorized and validly issued and are fully paid and nonassessable and are owned directly by the Company or by another wholly owned subsidiary of the Company free and clear of any security interests, liens, encumbrances, equities or claims, other than those described in the Disclosure Package and the Final Prospectus.

(w) No holder of any security of the Company has any right granted by the Company, which has not been waived or previously satisfied, to have any security owned by such holder included in the Registration Statement or, except as described in the Disclosure Package and the Final Prospectus, to demand registration of the sale of any security owned by such holder.

(x) To the knowledge of the Company and except as described in the Disclosure Package and the Final 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 of the Company or any of its subsidiaries is the subject which, if determined adversely to the Company or any of its subsidiaries would reasonably be expected to individually or in the aggregate have a Material Adverse Effect; and, to the knowledge of the Company, no such proceedings are threatened by governmental authorities or others that, if determined adversely to the Company or any of its subsidiaries, would reasonably be expected to have a Material Adverse Effect.

(y) All necessary corporate action has been duly and validly taken by the Company to authorize the execution, delivery and performance of this Agreement and the issuance and sale of the Securities by the Company. This Agreement has been duly and validly authorized, executed and delivered by the Company and constitutes and will constitute the legal, valid and binding obligation of the Company enforceable against the Company in accordance with its respective terms, except as the enforceability thereof may be limited by bankruptcy, insolvency, reorganization, moratorium or other similar laws affecting the enforcement of creditors' rights generally and by general equitable principles.

(z) Neither the Company nor any of its subsidiaries is involved in any labor dispute nor, to the knowledge of the Company, is any such dispute threatened, which dispute would reasonably be expected to have a Material Adverse Effect. The Company is not aware of any existing or imminent labor disturbance by the employees of any of its principal suppliers or contractors which would reasonably be expected to have a Material Adverse Effect. The Company is not aware of any threatened or pending litigation between the Company or its subsidiaries and any of its executive officers which, if adversely determined, would reasonably be expected to have a Material Adverse Effect.

(aa) No transaction has occurred between or among the Company and any of its officers or directors, stockholders or any affiliate or affiliates of any such officer or director or stockholder that is required to be described in and is not described in the Registration Statement, the Disclosure Package and the Final Prospectus.

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(bb) The Company has not taken, nor will it take, directly or indirectly, any action designed to or which would reasonably be expected to cause or result in, or which has constituted or which might reasonably be expected to constitute, the stabilization or manipulation of the price of the Common Stock to facilitate the sale or resale of any of the Securities, in each case contrary to applicable law.

(cc) Except as any failure to comply with the following would not reasonably be expected to have a Material Adverse Effect, the Company and each of its subsidiaries has accurately prepared and filed all material Federal, state, local and foreign tax returns which are required to be filed through the date hereof, or has received timely extensions thereof, and has paid all taxes shown on such returns and all assessments received by it to the extent that the same are material and have become due. Except as would not reasonably be expected to have a Material Adverse Effect, to the Company's knowledge, there are no tax audits or investigations pending; nor to the Company's knowledge are there any material proposed additional tax assessments against the Company or any of its subsidiaries.

(dd) The Common Stock is registered pursuant to Section 12(b) of the Exchange Act and the Securities have been duly authorized for listing on the Nasdaq Stock Market LLC's Global Select Market ("Nasdaq").

(ee) The Company has taken no action designed to, or to the Company's knowledge is likely to have the effect of, terminating the registration of the Common Stock under the Exchange Act or the listing of the Common Stock on Nasdaq, nor has the Company received any notification that the SEC or Nasdaq is contemplating terminating such registration or listing. The Company has complied in all material respects with the applicable requirements of Nasdaq for maintenance of inclusion of the Common Stock thereon.

(ff) The Company and its subsidiaries make and keep accurate books, records and accounts. The Company and its subsidiaries maintain a system of internal accounting controls sufficient to provide reasonable assurances that (i) transactions are executed in accordance with management's general or specific authorizations, (ii) transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles and to maintain asset accountability, (iii) access to assets is permitted only in accordance with management's general or specific authorization and (iv) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences; the principal executive officer and the principal financial officer of the Company have made all certifications required by the Sarbanes-Oxley Act of 2002 (the "Sarbanes-Oxley Act") and any related rules and regulations promulgated by the SEC, and the statements contained in any such certification were complete and correct as of the dates on which they were made; the Company and each of its subsidiaries is otherwise in compliance in all material respects with all applicable effective provisions of the Sarbanes-Oxley Act.

(gg) The Company and its subsidiaries are insured by insurers of recognized financial responsibility against such losses and risks and in such amounts as are customary in the businesses in which they are engaged or propose to engage immediately after giving effect to the offering of the Securities as described in the Disclosure Package and the Final Prospectus; all policies of insurance insuring the Company or its subsidiaries are in full force and effect. The Company and each of its subsidiaries are in compliance with the terms of such policies and instruments in all material respects.

(hh) Each approval, consent, order, authorization, designation, declaration or filing of, by or with any regulatory, administrative or other governmental body necessary in connection with the execution and delivery by the Company of this Agreement and the consummation of the transactions herein contemplated required to be obtained or performed by the Company (except such additional steps as may be required by the Financial Industry Regulatory Authority (“FINRA”) or may be necessary to qualify the Securities for public offering by the Underwriters under the state securities or Blue Sky laws) has been obtained or made and is in full force and effect.

(ii) All of the information provided to the Underwriters or to counsel for the Underwriters by the Company, its officers and directors and the holders of any securities (debt or equity) or options to acquire any securities of the Company in connection with letters, filings or other supplemental information provided to FINRA pursuant to FINRA Rules 5110, 5190 and 5121 is true, complete and correct. Neither the Company nor any of its affiliates directly, or indirectly through one or more intermediaries, controls, or is controlled by, or is under common control with, or is a person associated with any member firm of FINRA.

(jj) (i) Neither the Company nor any of its subsidiaries are in violation of any applicable rules, laws and regulation relating to the use, treatment, storage and disposal of toxic substances and protection of health or the environment (“Environmental Law”) which are applicable to its business, except for any violation which would not reasonably be expected to have a Material Adverse Effect; (ii) neither the Company nor its subsidiaries has received any notice from any governmental authority or third party of a material asserted claim under Environmental Laws; (iii) each of the Company and each of its subsidiaries has received all permits, licenses or other approvals required of it under applicable Environmental Laws material to the conduct of its business and is in compliance with all terms and conditions of any such permit, license or approval, except for where non-compliance would not reasonably be expected to have a Material Adverse Effect; (iv) to the Company’s knowledge, no facts currently exist that will require the Company or any of its subsidiaries to make future material capital expenditures to comply with Environmental Laws; and (v) no property which is or has been owned, or to the Company’s knowledge, leased or occupied by the Company or its subsidiaries has been designated as a Superfund site pursuant to the Comprehensive Environmental Response, Compensation of Liability Act of 1980, as amended (42 U.S.C. Section 9601, et. seq.) (“CERCLA”) or otherwise designated as a contaminated site under applicable state or local law. To the Company’s knowledge, neither the Company nor any of its subsidiaries has been named as a “potentially responsible party” under CERCLA.

(kk) In the ordinary course of its business, the Company periodically reviews the effect of Environmental Laws on the business, operations and properties of the Company and its subsidiaries, in the course of which the Company identifies and evaluates associated costs and liabilities (including, without limitation, any capital or operating expenditures required for clean-up, closure of properties or compliance with Environmental Laws, or any permit, license or approval, any related constraints on operating activities and any potential liabilities to third parties). On the basis of such review, the Company has reasonably concluded that such associated costs and liabilities would not, singly or in the aggregate, have a Material Adverse Effect.

(ll) The Company is not and, after giving effect to the offering and sale of the Securities and the application of the net proceeds therefrom as described in the Disclosure Package and the Final Prospectus, will not be subject to registration as an “investment company” within the meaning of the Investment Company Act of 1940, as amended.

(mm) Neither the Company nor any other person associated with or acting on behalf of the Company including, without limitation, any director, officer, agent or employee of the Company or its subsidiaries, has, while acting on behalf of the Company or its subsidiaries (i) used any corporate funds for unlawful contributions, gifts, entertainment or other unlawful expenses relating to political activity; (ii) made any unlawful payment to foreign or domestic government officials or employees or to foreign or domestic political parties or campaigns from corporate funds; (iii) violated any provision of the Foreign Corrupt Practices Act of 1977 or the U.K. Bribery Act 2010, each as amended, or similar law of any relevant jurisdiction, or the rules or regulations thereunder; or (iv) made any other unlawful payment.

(nn) The operations of the Company and its subsidiaries are and have been conducted at all times in compliance with applicable financial recordkeeping and reporting requirements of the Currency and Foreign Transactions Reporting Act of 1970, as amended, the money laundering statutes of all jurisdictions applicable to the Company, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any governmental agency (collectively, the “Money Laundering Laws”) and no action, suit or proceeding by or before any court or governmental agency, authority or body or any arbitrator involving the Company or any of its subsidiaries with respect to the Money Laundering Laws is pending, or to the knowledge of the Company, threatened.

(oo) 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 (i) is, or is controlled or 50% or more owned in the aggregate by or is acting on behalf of, one or more individuals or entities that are currently the subject of any sanctions administered or enforced by the United States (including any administered or enforced by the Office of Foreign Assets Control of the U.S. Department of the Treasury, the U.S. Department of State or the Bureau of Industry and Security of the U.S. Department of Commerce), the United Nations Security Council, the European Union, a

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member state of the European Union (including sanctions administered or enforced by Her Majesty's Treasury of the United Kingdom) or other relevant sanctions authority (collectively, "Sanctions" and such persons, "Sanctioned Persons" and each such person, a "Sanctioned Person"), (ii) is located, organized or resident in a country or territory that is, or whose government is, the subject of Sanctions that broadly prohibit dealings with that country or territory (collectively, "Sanctioned Countries" and each, a "Sanctioned Country") or (iii) will, directly or indirectly, use the proceeds of the offering of the Securities, or lend, contribute or otherwise make available such proceeds to any subsidiary, joint venture partner or other individual or entity in any manner that would result in a violation of any Sanctions by, or would result in the imposition of Sanctions against, any individual or entity (including any individual or entity participating in the offering, whether as underwriter, advisor, investor or otherwise). Neither the Company nor any of its subsidiaries has engaged in any dealings or transactions with or for the benefit of a Sanctioned Person, or with or in a Sanctioned Country, in the preceding 3 years, nor does the Company or any of its subsidiaries have any plans to engage in dealings or transactions with or for the benefit of a Sanctioned Person, or with or in a Sanctioned Country.

(pp) Except as described in the Disclosure Package and the Final Prospectus, the Company has not sold or issued any shares of Common Stock during the six-month period preceding the date of the Final Prospectus, including any sales pursuant to Rule 144A under, or Regulations D or S of, the Securities Act, other than shares issued pursuant to equity incentive plans or other employee compensation plans or pursuant to outstanding options, rights or warrants.

(qq) The Company has fulfilled its obligations, if any, in all material respects under the minimum funding standards of Section 302 of the U.S. Employee Retirement Income Security Act of 1974 ("ERISA") and the regulations and published interpretations thereunder with respect to each "plan" as defined in Section 3(3) of ERISA and such regulations and published interpretations in which its employees are eligible to participate and each such plan is in compliance in all material respects with the presently applicable provisions of ERISA and such regulations and published interpretations. No "Reportable Event" (as defined in 12 ERISA) has occurred with respect to any "Pension Plan" (as defined in ERISA) for which the Company would have any material liability.

(rr) The Company has established and maintains disclosure controls and procedures (as such term is defined in Rule 13a-15 under the Exchange Act), which (i) are designed to ensure that material information relating to the Company is made known to the Company's principal executive officer and its principal financial officer by others within the Company, particularly during the periods in which the periodic reports required under the Exchange Act are being prepared; (ii) provide for the periodic evaluation of the effectiveness of such disclosure controls and procedures as required by the Exchange Act; and (iii) are effective in all material respects to perform the functions for which they were established. Based on the evaluation of its disclosure controls and procedures, the Company is not aware of (i) any significant deficiency in design or

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operation of internal controls that would adversely affect the Company's ability to record, process, summarize and report financial data or any material weaknesses to internal controls; or (ii) any fraud, whether or not material, that involves management or other employees who have a significant role in the Company's internal controls. Since the date of the most recent evaluation of such disclosure controls and procedures, there have been no changes that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting, including any corrective actions with regard to significant deficiencies and material weaknesses.

(ss) There are no material off-balance sheet arrangements (as defined in Item 303 of Regulation S-K) that have or are reasonably likely to have a material current or future effect on the Company's financial condition, revenues or expenses, changes in financial condition, results of operations, liquidity, capital expenditures or capital resources that are required to be disclosed in the Disclosure Package and the Final Prospectus and have not been so disclosed.

(tt) The Board has validly appointed an audit committee whose composition satisfies the requirements of Rule 5605(c)(2) of the Nasdaq Stock Market Rules and the Board and/or the audit committee has adopted a charter that satisfied the requirements of Rule 5605(c)(1) of the Nasdaq Stock Market Rules. The audit committee has reviewed the adequacy of its charters within the past twelve months.

(uu) (i) All audit and non-audit services performed by Ernst & Young LLP have been preapproved in accordance with the requirements set forth in Section 10A of the Exchange Act and (ii) Ernst & Young LLP has not engaged and as of the date hereof are not engaging in any "prohibited activities" (as defined in Section 10A of the Exchange Act) on behalf of the Company.

(vv) Except as described in the Registration Statement, the Disclosure Package and the Final Prospectus, the Company: (i) has not received any FDA Form 483, notice of adverse finding, warning letter, untitled letter or other correspondence or notice from the FDA or any arbitrator, court, governmental body, regulatory body, administrative agency or other authority, body or agency having jurisdiction over the Company or any of its properties, assets or operations (each, a "Governmental Entity") alleging or asserting material noncompliance with any Health Care Laws (as defined below) or any Permits required by any such Health Care Laws ("Authorizations"); (ii) possesses all material Authorizations and such Authorizations are valid and in full force and effect and the Company is not in material violation of any term of any such Authorizations; (iii) has not received notice that the FDA or any Governmental Entity has taken, is taking or intends to take action to limit, suspend, modify or revoke any material Authorizations and has no knowledge that the FDA or any Governmental Entity is considering such action; and (iv) has filed, obtained, maintained or submitted all material reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by any Health Care Laws or Authorizations and that all such material reports, documents, forms, notices, applications, records, claims,

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submissions and supplements or amendments were materially complete and correct on the date filed (or were corrected or supplemented by a subsequent submission).

(ww) The Company has operated and currently is in compliance in all material respects with all applicable Health Care Laws, rules and regulations, including, without limitation, (i) the Federal Food, Drug and Cosmetic Act (21 U.S.C. §§ 301 et seq.) (the “FFDCA”); (ii) all applicable federal, state, local and all applicable foreign healthcare related fraud and abuse laws, including, without limitation, the federal Anti-Kickback Statute (42 U.S.C. § 1320a-7b(b)), the U.S. Physician Payments Sunshine Act (42 U.S.C. § 1320a-7h), the civil False Claims Act (31 U.S.C. §§ 3729 et seq.), the criminal False Claims Law (42 U.S.C. § 1320a-7b(a)), all criminal laws relating to healthcare fraud and abuse, including but not limited to 18 U.S.C. Sections 286 and 287, the healthcare fraud criminal provisions under the U.S. Health Insurance Portability and Accountability Act of 1996 (“HIPAA”) (42 U.S.C. §§ 1320d et seq.), the exclusion laws (42 U.S.C. § 1320a-7), and the civil monetary penalties law (42 U.S.C. § 1320a-7a), (iii) Medicare (Title XVIII of the Social Security Act), and Medicaid (Title XIX of the Social Security Act); (iv) HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 (42 U.S.C. §§ 17921 et seq.); (v) the Public Health Service Act (42 U.S.C. §§ 201 et seq.); (vi) the regulations promulgated pursuant to such laws; and (vii) any other similar local, state, federal, or foreign laws (collectively, the “Health Care Laws”). Neither the Company, nor any of its officers or directors, nor, to the knowledge of the Company, its employees or agents have engaged in activities which are, as applicable, cause for false claims liability, civil penalties, or mandatory or permissive exclusion from Medicare, Medicaid, or any other state or federal healthcare program. The Company has not received notice or other correspondence of any claim, action, suit, audit, survey, proceeding, hearing, enforcement, investigation, arbitration or other action (“Action”) from any court or arbitrator or Governmental Entity or third party alleging or asserting noncompliance with any Health Care Law applicable to the Company or Authorizations, and, to the Company’s knowledge, no such Action is threatened. The Company is not a party to and does not have any ongoing reporting obligations pursuant to any corporate integrity agreement, deferred prosecution agreement, monitoring agreement, consent decree, settlement order, plan of correction or similar agreement with or imposed by any governmental or regulatory authority. Additionally, neither the Company, nor any of its officers or directors, nor, to the knowledge of the Company, its employees, has been excluded, suspended or debarred from participation in any U.S. state or federal health care program or human clinical research or is subject to a governmental inquiry, investigation, proceeding, or other any other Action that could reasonably be expected to result in debarment, suspension, or exclusion.

(xx) The studies, tests and preclinical and clinical trials conducted by or on behalf of the Company were and, if still ongoing, are being conducted in all material respects in accordance with experimental protocols, procedures and controls pursuant to accepted professional scientific standards and all Authorizations and Health Care Laws, including, without limitation, the FFDCA and 21 C.F.R. Parts 50, 54, 56, 58, and 312; the descriptions of the results of such studies, tests and trials contained in the Registration Statement, the Disclosure Package and the Final Prospectus are accurate and complete in

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all material respects and fairly present the data derived from such studies, tests and trials; except to the extent disclosed in the Registration Statement, the Disclosure Package and the Final Prospectus, the Company is not aware of any studies, tests or trials, the results of which the Company believes reasonably call into question the study, test, or trial results described or referred to in the Registration Statement, the Disclosure Package and the Final Prospectus; and, except to the extent disclosed in the Registration Statement, the Disclosure Package or the Final Prospectus, the Company has not received any notices or correspondence from the FDA or Governmental Entity requiring the termination or suspension of any studies, tests or preclinical or clinical trials that are described in the Registration Statement, the Disclosure Package or the Final Prospectus, other than ordinary course communications with respect to modifications in connection with the design and implementation of such trials, copies of which communications have been made available to the Underwriters.

(yy) No person has the right to require the Company to register any securities for offering and sale under the Securities Act by reason of the filing of the Registration Statement with the SEC or by reason of the issuance and sale of the Securities, except for rights which have been waived.

(zz) The Company has not, directly or indirectly, extended or maintained credit, or arranged for the extension of credit, or renewed an extension of credit, in the form of a personal loan to or for any of its directors or executive officers in violation of applicable laws, including Section 402 of the Sarbanes-Oxley Act.

(aaa) Other than as contemplated by this Agreement, the Company has not incurred any liability for any brokerage commission, finder's fee or like payment in connection with the execution and delivery of this Agreement or the consummation of the transactions contemplated hereby.

(bbb) Except as disclosed in the Registration Statement, the Disclosure Package and the Final Prospectus, the Company (i) does not have any material lending or other relationship with any bank or lending affiliate of Citigroup Global Markets Holdings Inc. or Leerink Partners LLC and (ii) does not intend to use any of the proceeds from the sale of the Securities hereunder to repay any outstanding debt owed to any affiliate of Citigroup Global Markets Holdings Inc. or Leerink Partners LLC.

(ccc) Subject to any restrictions under applicable law, 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 or contemplated by the Disclosure Package and the Final Prospectus (exclusive of any supplement thereto) or except as would not reasonably be expected to have a Material Adverse Effect.

(ddd) Any certificate signed by any officer of the Company and delivered to the Representatives or counsel for the Underwriters in connection with the offering of the Securities shall be deemed a representation and warranty by the Company, as to matters covered thereby, to each Underwriter.

2. Purchase and Sale.

(a) Subject to the terms and conditions and in reliance upon the representations and warranties herein set forth, the Company agrees to sell to each Underwriter, and each Underwriter agrees, severally and not jointly, to purchase from the Company, at the purchase price set forth in Schedule I hereto, the number of Underwritten Securities set forth opposite such Underwriter's name in Schedule II hereto.

(b) Subject to the terms and conditions and in reliance upon the representations and warranties herein set forth, the Company hereby grants an option to the several Underwriters to purchase, severally and not jointly, up to the number of Option Securities set forth in Schedule I hereto at the same purchase price per share as the Underwriters shall pay for the Underwritten Securities, less an amount per share equal to any dividends or distributions declared by the Company and payable on the Underwritten Securities but not payable on the Option Securities. Said option may be exercised in whole or in part at any time on or before the 30th day after the date of the Final Prospectus upon written or telegraphic notice by the Representatives to the Company setting forth the number of Option Securities as to which the several Underwriters are exercising the option and the settlement date. The number of Option Securities to be purchased by each Underwriter shall be the same percentage of the total number of Option Securities to be purchased by the several Underwriters as such Underwriter is purchasing of the Underwritten Securities, subject to such adjustments as you in your absolute discretion shall make to eliminate any fractional shares.

3. Delivery and Payment. Delivery of and payment for the Underwritten Securities and the Option Securities (if the option provided for in Section 2(b) hereof shall have been exercised on or before the second Business Day immediately preceding the Closing Date) shall be made on the date and at the time specified in Schedule I hereto or at such time on such later date not more than two Business Days after the foregoing date as the Representatives shall designate, which date and time may be postponed by agreement between the Representatives and the Company or as provided in Section 9 hereof (such date and time of delivery and payment for the Securities being herein called the "Closing Date"). As used herein, "Business Day" shall mean any day other than a Saturday, a Sunday or a legal holiday or a day on which banking institutions or trust companies are authorized or obligated by law to close in New York City. Delivery of the Securities shall be made to the Representatives for the respective accounts of the several Underwriters against payment by the several Underwriters through the Representatives of the purchase price thereof to or upon the order of the Company by wire transfer payable in same-day funds to an account specified by the Company. Delivery of the Underwritten Securities and the Option Securities shall be made through the facilities of The Depository Trust Company unless the Representatives shall otherwise instruct.

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If the option provided for in Section 2(b) hereof is exercised after the second Business Day immediately preceding the Closing Date, the Company will deliver the Option Securities (at the expense of the Company) to the Representatives, at 388 Greenwich Street, New York, New York, on the date specified by the Representatives (which shall be within two Business Days after exercise of said option) for the respective accounts of the several Underwriters, against payment by the several Underwriters through the Representatives of the purchase price thereof to or upon the order of the Company by wire transfer payable in same-day funds to an account specified by the Company. If settlement for the Option Securities occurs after the Closing Date, the Company will deliver to the Representatives on the settlement date for the Option Securities, and the obligation of the Underwriters to purchase the Option Securities shall be conditioned upon receipt of, supplemental opinions, certificates and letters confirming as of such date the opinions, certificates and letters delivered on the Closing Date pursuant to Section 6 hereof.

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

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

(a) Prior to the termination of the offering of the Securities, the Company will not file any amendment of the Registration Statement or supplement (including the Final Prospectus or any Preliminary Prospectus) to the Base Prospectus or any Rule 462(b) Registration Statement unless the Company has furnished you a copy for your review prior to filing and will not file any such proposed amendment or supplement to which you reasonably object. The Company will cause the Final Prospectus, properly completed, and any supplement thereto to be filed in a form approved by the Representatives with the SEC pursuant to the applicable paragraph of Rule 424(b) within the time period prescribed and will provide evidence satisfactory to the Representatives of such timely filing. The Company will promptly advise the Representatives (i) when the Final Prospectus, and any supplement thereto, shall have been filed (if required) with the SEC pursuant to Rule 424(b) or when any Rule 462(b) Registration Statement shall have been filed with the SEC, (ii) when, prior to termination of the offering of the Securities, any amendment to the Registration Statement shall have been filed or become effective, (iii) of any request by the SEC or its staff for any amendment of the Registration Statement, or any Rule 462(b) Registration Statement, or for any supplement to the Final Prospectus or for any additional information, (iv) of the issuance by the SEC of any stop order suspending the effectiveness of the Registration Statement or of any notice objecting to its use or the institution or threatening of any proceeding for that purpose and (v) of the receipt by the Company of any notification with respect to the suspension of the qualification of the Securities for sale in any jurisdiction or the institution or threatening of any proceeding for such purpose. The Company will use its best efforts to prevent the issuance of any such stop order or the occurrence of any such suspension or objection to the use of the Registration Statement and, upon such issuance, occurrence or notice of objection, to obtain as soon as possible the withdrawal of such stop order or relief from such occurrence or objection, including, if necessary, by filing an amendment to the Registration Statement or a new registration statement and using its

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best efforts to have such amendment or new registration statement declared effective as soon as practicable.

(b) If, at any time prior to the filing of the Final Prospectus pursuant to Rule 424(b), any event occurs as a result of which the Disclosure Package would include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein in the light of the circumstances under which they were made or the circumstances then prevailing not misleading, the Company will (i) notify promptly the Representatives so that any use of the Disclosure Package may cease until it is amended or supplemented; (ii) amend or supplement the Disclosure Package to correct such statement or omission; and (iii) supply any amendment or supplement to you in such quantities as you may reasonably request.

(c) If, at any time when a prospectus relating to the Securities is required to be delivered under the Securities Act (including in circumstances where such requirement may be satisfied pursuant to Rule 172), any event occurs as a result of which the Final Prospectus as then supplemented would include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein in the light of the circumstances under which they were made or the circumstances then prevailing not misleading, or if it shall be necessary to amend the Registration Statement, file a new registration statement or supplement the Final Prospectus to comply with the Securities Act or the Exchange Act or the respective rules thereunder, including in connection with use or delivery of the Final Prospectus, the Company promptly will (i) notify the Representatives of any such event, (ii) prepare and file with the SEC, subject to the second sentence of paragraph (a) of this Section 5, an amendment or supplement or new registration statement which will correct such statement or omission or effect such compliance, (iii) use its best efforts to have any amendment to the Registration Statement or new registration statement declared effective as soon as practicable in order to avoid any disruption in use of the Final Prospectus and (iv) supply any supplemented Final Prospectus to you in such quantities as you may reasonably request.

(d) As soon as practicable, the Company will make generally available to its security holders and to the Representatives an earnings statement or statements of the Company and its subsidiaries which will satisfy the provisions of Section 11(a) of the Securities Act and Rule 158 under the Securities Act.

(e) The Company will furnish to the Representatives and counsel for the Underwriters, without charge, signed copies of the Registration Statement (including exhibits thereto) and to each other Underwriter a copy of the Registration Statement (without exhibits thereto) and, so long as delivery of a prospectus by an Underwriter or dealer may be required by the Securities Act (including in circumstances where such requirement may be satisfied pursuant to Rule 172), as many copies of each Preliminary Prospectus, the Final Prospectus and each Issuer Free Writing Prospectus and any supplement thereto as the Representatives may reasonably request. The Company will pay the expenses of printing or other production of all documents relating to the offering.

(f) The Company will arrange, if necessary, for the qualification of the Securities for sale under the laws of such jurisdictions as the Representatives may designate and will maintain such qualifications in effect so long as required for the distribution of the Securities; provided that in no event shall the Company be obligated to qualify to do business in any jurisdiction where it is not now so qualified or to take any action that would subject it to service of process in suits, other than those arising out of the offering or sale of the Securities, in any jurisdiction where it is not now so subject.

(g) The Company will not, for a period of sixty (60) days from the date of this Agreement, without the prior written consent of Citigroup Global Markets Inc. and Leerink Partners LLC, offer, sell, contract to sell, pledge, or otherwise dispose of, (or enter into any transaction which is designed to, or might reasonably be expected to, result in the disposition (whether by actual disposition or effective economic disposition due to cash settlement or otherwise) by the Company or any affiliate of the Company or any person in privity with the Company or any affiliate of the Company) directly or indirectly, including the filing (or participation in the filing) of a registration statement with the SEC in respect of, or establish or increase a put equivalent position or liquidate or decrease a call equivalent position within the meaning of Section 16 of the Exchange Act, any other shares of Common Stock or any securities convertible into, or exercisable for, shares Common Stock; or publicly announce an intention to effect any such transaction, until the Business Day set forth on Schedule I hereto, provided, however, that the Company may, without obtaining such prior written consent, issue and sell Common Stock pursuant to or in connection with (i) any equity incentive plan, inducement plan, employee stock purchase plan, stock ownership plan or dividend reinvestment plan of the Company in effect at the Execution Time, (ii) the conversion of securities or the exercise of options or warrants outstanding at the Execution Time, (iii) the consummation by the Company of a strategic partnership, joint venture, collaboration or acquisition or license of any business products or technology, provided that (A) the aggregate number of shares of Common Stock that may be issued pursuant to this clause (iii) shall not exceed ten percent (10%) of the number of shares of Common Stock outstanding immediately after the closing of the sale of the Securities to the Underwriters pursuant to this Agreement and (B) the recipient of such shares shall agree to execute a letter substantially in the form of Exhibit A hereto for the remainder of the term set forth in such letter, and (iv) following the date that is thirty (30) days following the Closing Date, issuances pursuant to that certain Equity Distribution Agreement, dated November 21, 2018, between the Company and Citigroup Global Markets Inc., provided that the aggregate number of shares of Common Stock that may be issued pursuant to this clause (iv) shall not exceed 1,000,000 shares and the price at which such shares of Common Stock are sold pursuant to this clause (iv) shall not be less than the "Price per Share to Public" set forth on Schedule I.

(h) The Company will not take, directly or indirectly, any action designed to or that would constitute or that might reasonably be expected to cause or result in, under the Exchange Act or otherwise, stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of the Securities.

(i) The Company agrees to pay the costs and expenses relating to the following matters: (i) the preparation, printing or reproduction and filing with the SEC of the Registration Statement (including financial statements and exhibits thereto), each Preliminary Prospectus, the Final Prospectus and each Issuer Free Writing Prospectus, and each amendment or supplement to any of them; (ii) the printing (or reproduction) and delivery (including postage, air freight charges and charges for counting and packaging) of such copies of the Registration Statement, each Preliminary Prospectus, the Final Prospectus and each Issuer Free Writing Prospectus, and all amendments or supplements

to any of them, as may, in each case, be reasonably requested for use in connection with the offering and sale of the Securities; (iii) the preparation, printing, authentication, issuance and delivery of certificates for the Securities, including any stamp or transfer taxes in connection with the original issuance and sale of the Securities; (iv) the printing (or reproduction) and delivery of this Agreement, any blue sky memorandum and all other agreements or documents printed (or reproduced) and delivered in connection with the offering of the Securities; (v) the registration of the Securities under the Exchange Act and the listing of the Securities on the Nasdaq Global Select Market; (vi) any registration or qualification of the Securities for offer and sale under the securities or blue sky laws of the several states (including filing fees and the reasonable fees and expenses of counsel for the Underwriters relating to such registration and qualification, provided such fees and expenses of counsel do not exceed \$15,000 in the aggregate); (vii) any filings required to be made with FINRA (including filing fees and the reasonable fees and expenses of counsel for the Underwriters relating to such filings, provided such fees and expenses of counsel do not exceed \$15,000 in the aggregate); (viii) the transportation and other expenses incurred by or on behalf of Company representatives in connection with presentations to prospective purchasers of the Securities; (ix) the fees and expenses of the Company's accountants and the fees and expenses of counsel (including local and special counsel) for the Company; and (x) all other costs and expenses incident to the performance by the Company of its obligations hereunder; *provided* that, the Underwriters shall pay their own costs and expenses, including the fees and expenses of their counsel, any transfer taxes on the resale of any Securities by them and the expenses of advertising any offering of the Securities made by the Underwriters.

(j) The Company agrees that, unless it has or shall have obtained the prior written consent of the Representatives, and each Underwriter, severally and not jointly, agrees with the Company that, unless it has or shall have obtained, as the case may be, the prior written consent of the Company, it has not made and will not make any offer relating to the Securities that would constitute an Issuer Free Writing Prospectus or that would otherwise constitute a Free Writing Prospectus required to be filed by the Company with the SEC or retained by the Company under Rule 433 under the Securities Act ("Rule 433"); provided that the prior written consent of the parties hereto shall be deemed to have been given in respect of the Free Writing Prospectuses included in Schedule III hereto and any electronic road show. Any such free writing prospectus consented to by the Representatives or the Company is hereinafter referred to as a "Permitted Free Writing Prospectus." The Company agrees that (x) it has treated and will treat, as the case may be, each Permitted Free Writing Prospectus as an Issuer Free Writing Prospectus and (y) it has complied and will comply, as the case may be, with the requirements of Rule 164 under the Securities Act ("Rule 164") and Rule 433 applicable to any Permitted Free Writing Prospectus, including in respect of timely filing with the SEC, legending and record keeping.

6. Conditions to the Obligations of the Underwriters. The obligations of the Underwriters to purchase the Underwritten Securities and the Option Securities, as the case may be, shall be subject to the accuracy of the representations and warranties on the part of the Company contained herein as of the Execution Time, the Closing Date and any settlement date

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pursuant to Section 3 hereof, to the accuracy of the statements of the Company made in any certificates pursuant to the provisions hereof, to the performance by the Company of its obligations hereunder and to the following additional conditions:

(a) The Final Prospectus, and any supplement thereto, have been filed in the manner and within the time period required by Rule 424(b); any material required to be filed by the Company pursuant to Rule 433(d) shall have been filed with the SEC within the applicable time periods prescribed for such filings by Rule 433; and no stop order suspending the effectiveness of the Registration Statement or any notice objecting to its use shall have been issued and no proceedings for that purpose shall have been instituted or threatened.

(b) The Company shall have requested and caused Cooley LLP, counsel for the Company, to have furnished to the Representatives their opinion and negative assurance letter, each dated the Closing Date and addressed to the Representatives, in the forms and substance satisfactory to the Representatives.

(c) The Company shall have requested and caused Gavrilovich, Dodd & Lindsey LLP, special intellectual property counsel for the Company, to have furnished to the Representatives their opinion, dated the Closing Date and addressed to the Representatives, in the form and substance satisfactory to the Representatives.

(d) The Representatives shall have received from Latham & Watkins LLP, counsel for the Underwriters, such opinion or opinions, dated the Closing Date and addressed to the Representatives, with respect to the issuance and sale of the Securities, the Registration Statement, the Disclosure Package, the Final Prospectus (together with any supplement thereto) and other related matters as the Representatives may reasonably require, and the Company shall have furnished to such counsel such documents as they request for the purpose of enabling them to pass upon such matters.

(e) The Company shall have furnished to the Representatives a certificate of the Company, signed by the Chairman of the Board or the Chief Executive Officer and the Chief Financial Officer of the Company, dated the Closing Date, to the effect that the signers of such certificate have carefully examined the Registration Statement, the Disclosure Package, the Final Prospectus and any amendments or supplements thereto, as well as each electronic road show used in connection with the offering of the Securities, and this Agreement and that:

(i) the representations and warranties of the Company in this Agreement are true and correct on and as of the Closing Date with the same effect as if made on the Closing Date and the Company has complied with all the agreements and satisfied all the conditions on its part to be performed or satisfied at or prior to the Closing Date;

(ii) no stop order suspending the effectiveness of the Registration Statement or any notice objecting to its use has been issued and no proceedings

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for that purpose have been instituted or, to the Company's knowledge, threatened; and

(iii) since the date of the most recent financial statements included or incorporated by reference in the Disclosure Package and the Final Prospectus (exclusive of any amendment or supplement thereto), there has been no material adverse change in the condition (financial or otherwise), prospects, earnings, business or properties of the Company and its subsidiaries, taken as a whole, whether or not arising from transactions in the ordinary course of business, except as set forth in or contemplated in the Disclosure Package and the Final Prospectus (exclusive of any amendment or supplement thereto).

(f) The Company shall have requested and caused Ernst & Young LLP to have furnished to the Representatives, at the Execution Time and at the Closing Date, letters (which may refer to letters previously delivered to one or more of the Representatives), dated respectively as of the Execution Time and as of the Closing Date, in form and substance satisfactory to the Representatives, containing statements and information of the type ordinarily included in accountants' "comfort letters" to underwriters with respect to the financial statements and certain financial information contained in the Registration Statement, the Disclosure Package and Final Prospectus.

(g) Subsequent to the Execution Time or, if earlier, the dates as of which information is given in the Registration Statement (exclusive of any amendment thereof) and the Final Prospectus (exclusive of any supplement thereto), there shall not have been (i) any change specified in the letter or letters referred to in paragraph (e) of this Section 6 or (ii) any change, or any development involving a prospective change, in or affecting the condition (financial or otherwise), earnings, business or properties of the Company and its subsidiaries taken as a whole, whether or not arising from transactions in the ordinary course of business, except as set forth in or contemplated in the Disclosure Package and the Final Prospectus (exclusive of any amendment or supplement thereto) the effect of which, in any case referred to in clause (i) or (ii) above, is, in the sole judgment of the Representatives, so material and adverse as to make it impractical or inadvisable to proceed with the offering or delivery of the Securities as contemplated by the Registration Statement (exclusive of any amendment thereof), the Disclosure Package and the Final Prospectus (exclusive of any amendment or supplement thereto).

(h) Prior to the Closing Date, the Company shall have furnished to the Representatives such further information, certificates and documents as the Representatives may reasonably request.

(i) Subsequent to the Execution Time, there shall not have been any decrease in the rating of any of the Company's debt securities by any "nationally recognized statistical rating organization" (as defined for purposes of Rule 3(a)(62) under the Exchange Act) or any notice given of any intended or potential decrease in any such rating or of a possible change in any such rating that does not indicate the direction of the possible change.

(j) The Securities shall have been approved for trading on the Nasdaq Global Select Market, and satisfactory evidence of such actions shall have been provided to the Representatives.

(k) At the Execution Time, the Company shall have furnished to the Representatives a letter substantially in the form of Exhibit A hereto from each officer and director of the Company addressed to the Representatives.

If any of the conditions specified in this Section 6 shall not have been fulfilled when and as provided in this Agreement, or if any of the opinions and certificates mentioned above or elsewhere in this Agreement shall not be reasonably satisfactory in form and substance to the Representatives and counsel for the Underwriters, this Agreement and all obligations of the Underwriters hereunder may be canceled at, or at any time prior to, the Closing Date by the Representatives. Notice of such cancellation shall be given to the Company in writing or by telephone or facsimile confirmed in writing.

The documents required to be delivered by this Section 6 shall be delivered at the office of Latham & Watkins LLP, counsel for the Underwriters, at 12670 High Bluff Drive, San Diego, California 92130, on each such date as provided in this Agreement.

7. Reimbursement of Underwriters' Expenses. If the sale of the Securities provided for herein is not consummated because any condition to the obligations of the Underwriters set forth in Section 6 hereof is not satisfied, because of any termination pursuant to Section 10 hereof or because of any refusal, inability or failure on the part of the Company to perform any agreement herein or comply with any provision hereof other than by reason of a default by any of the Underwriters, the Company will reimburse the Underwriters severally through Citigroup Global Markets Inc. and Leerink Partners LLC on demand for all reasonable expenses (including reasonable fees and disbursements of counsel) that shall have been incurred by them in connection with the proposed purchase and sale of the Securities.

8. Indemnification and Contribution.

(a) The Company agrees to indemnify and hold harmless each Underwriter, the directors, officers, employees, affiliates and agents of each Underwriter and each person who controls any Underwriter within the meaning of either the Securities Act or the Exchange Act against any and all losses, claims, damages or liabilities, joint or several, to which they or any of them may become subject under the Securities Act, the Exchange Act or other Federal or state statutory law or regulation, at common law or otherwise, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement for the registration of the Securities as originally filed or in any amendment thereof, or in the Base Prospectus, any Preliminary Prospectus or any other preliminary prospectus supplement relating to the Securities, the Final Prospectus or any Issuer Free Writing Prospectus, or in any amendment thereof or supplement thereto, 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

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necessary to make the statements therein not misleading, and agrees to reimburse each such indemnified party, as incurred, for any legal or other expenses reasonably incurred by them in connection with investigating or defending any such loss, claim, damage, liability or action; provided, however, that the Company will not be liable in any such case to the extent that any such loss, claim, damage or liability arises out of or is based upon any such untrue statement or alleged untrue statement or omission or alleged omission made therein in reliance upon and in conformity with written information furnished to the Company by or on behalf of any Underwriter through the Representatives specifically for inclusion therein. This indemnity agreement will be in addition to any liability which the Company may otherwise have.

(b) Each Underwriter severally and not jointly agrees to indemnify and hold harmless the Company, each of its directors, each of its officers who signs the Registration Statement, and each person who controls the Company within the meaning of either the Securities Act or the Exchange Act, to the same extent as the foregoing indemnity from the Company to each Underwriter, but only with reference to written information relating to such Underwriter furnished to the Company by or on behalf of such Underwriter through the Representatives specifically for inclusion in the documents referred to in the foregoing indemnity. This indemnity agreement will be in addition to any liability which any Underwriter may otherwise have. The Company acknowledges that the statements set forth (i) in the last paragraph of the cover page regarding delivery of the Securities and, under the heading “Underwriting,” (ii) the list of Underwriters and their respective participation in the sale of the Securities, (iii) the sentences related to concessions and (iv) the paragraph related to stabilization, syndicate covering transactions and penalty bids in any Preliminary Prospectus and the Final Prospectus constitute the only information furnished in writing by or on behalf of the several Underwriters for inclusion in any Preliminary Prospectus, the Final Prospectus or any Issuer Free Writing Prospectus.

(c) Promptly after receipt by an indemnified party under this Section 8 of notice of the commencement of any action, such indemnified party will, if a claim in respect thereof is to be made against the indemnifying party under this Section 8, notify the indemnifying party in writing of the commencement thereof; but the failure so to notify the indemnifying party (i) will not relieve it from liability under paragraph (a) or (b) above unless and to the extent it did not otherwise learn of such action and such failure results in the forfeiture by the indemnifying party of substantial rights and defenses and (ii) will not, in any event, relieve the indemnifying party from any obligations to any indemnified party other than the indemnification obligation provided in paragraph (a) or (b) above. The indemnifying party shall be entitled to appoint counsel of the indemnifying party’s choice at the indemnifying party’s expense to represent the indemnified party in any action for which indemnification is sought (in which case the indemnifying party shall not thereafter be responsible for the fees and expenses of any separate counsel retained by the indemnified party or parties except as set forth below); provided, however, that such counsel shall be reasonably satisfactory to the indemnified party. Notwithstanding the indemnifying party’s election to appoint counsel to represent the indemnified party in an action, the indemnified party shall have the right to employ

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separate counsel (including local counsel), and the indemnifying party shall bear the reasonable fees, costs and expenses of such separate counsel if (i) the use of counsel chosen by the indemnifying party to represent the indemnified party would present such counsel with a conflict of interest, (ii) the actual or potential defendants in, or targets of, any such action include both the indemnified party and the indemnifying party and the indemnified party shall have reasonably concluded that there may be legal defenses available to it and/or other indemnified parties which are different from or additional to those available to the indemnifying party, (iii) the indemnifying party shall not have employed counsel reasonably satisfactory to the indemnified party to represent the indemnified party within a reasonable time after notice of the institution of such action or (iv) the indemnifying party shall authorize the indemnified party to employ separate counsel at the expense of the indemnifying party. An indemnifying party will not, without the prior written consent of the indemnified parties, settle or compromise or consent to the entry of any judgment with respect to any pending or threatened claim, action, suit or proceeding in respect of which indemnification or contribution may be sought hereunder (whether or not the indemnified parties are actual or potential parties to such claim or action) unless such settlement, compromise or consent (i) includes an unconditional release of each indemnified party from all liability arising out of such claim, action, suit or proceeding and (ii) does not include a statement as to an admission of fault, culpability or a failure to act, by or on behalf of any indemnified party.

(d) In the event that the indemnity provided in paragraph (a), (b) or (c) of this Section 8 is unavailable to or insufficient to hold harmless an indemnified party for any reason, the Company and the Underwriters severally agree to contribute to the aggregate losses, claims, damages and liabilities (including legal or other expenses reasonably incurred in connection with investigating or defending the same) (collectively, “Losses”) to which the Company and one or more of the Underwriters may be subject in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and by the Underwriters on the other from the offering of the Securities. If the allocation provided by the immediately preceding sentence is unavailable for any reason, the Company and the Underwriters severally shall contribute 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 of the Underwriters on the other in connection with the statements or omissions which resulted in such Losses as well as any other relevant equitable considerations. Benefits received by the Company shall be deemed to be equal to the total net proceeds from the offering (before deducting expenses) received by it, and benefits received by the Underwriters shall be deemed to be equal to the total underwriting discounts and commissions, in each case as set forth on the cover page of the Final Prospectus. Relative fault shall be determined by reference to, among other things, whether any untrue or any alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information provided by the Company on the one hand or the Underwriters on the other, the intent of the parties and their relative knowledge, access to information and opportunity to correct or prevent such untrue statement or omission. The Company and the Underwriters agree that it

would not be just and equitable if contribution were determined by pro rata allocation or any other method of allocation which does not take account of the equitable considerations referred to above. Notwithstanding the provisions of this paragraph (d), in no event shall an Underwriter be required to contribute any amount in excess of the amount by which the total underwriting discounts and commissions received by such Underwriter with respect to the offering of the Securities exceeds the amount of any damages that such Underwriter has otherwise been required to pay by reason of such untrue or alleged untrue statement or omission or alleged omission. Notwithstanding the provisions of this paragraph (d), no person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. For purposes of this Section 8, each person who controls an Underwriter within the meaning of either the Securities Act or the Exchange Act and each director, officer, employee, affiliate and agent of an Underwriter shall have the same rights to contribution as such Underwriter, and each person who controls the Company within the meaning of either the Securities Act or the Exchange Act, each officer of the Company who shall have signed the Registration Statement and each director of the Company shall have the same rights to contribution as the Company, subject in each case to the applicable terms and conditions of this paragraph (d).

9. Default by an Underwriter. If any one or more Underwriters shall fail to purchase and pay for any of the Securities agreed to be purchased by such Underwriter or Underwriters hereunder and such failure to purchase shall constitute a default in the performance of its or their obligations under this Agreement, the remaining Underwriters shall be obligated severally to take up and pay for (in the respective proportions which the amount of Securities set forth opposite their names in Schedule I hereto bears to the aggregate amount of Securities set forth opposite the names of all the remaining Underwriters) the Securities which the defaulting Underwriter or Underwriters agreed but failed to purchase; provided, however, that in the event that the aggregate amount of Securities which the defaulting Underwriter or Underwriters agreed but failed to purchase shall exceed 10% of the aggregate amount of Securities set forth in Schedule II hereto, the remaining Underwriters shall have the right to purchase all, but shall not be under any obligation to purchase any, of the Securities, and if such non-defaulting Underwriters do not purchase all the Securities, this Agreement will terminate without liability to any non-defaulting Underwriter or the Company. In the event of a default by any Underwriter as set forth in this Section 9, the Closing Date shall be postponed for such period, not exceeding five Business Days, as the Representatives shall determine in order that the required changes in the Registration Statement and the Final Prospectus or in any other documents or arrangements may be effected. Nothing contained in this Agreement shall relieve any defaulting Underwriter of its liability, if any, to the Company and any non-defaulting Underwriter for damages occasioned by its default hereunder.

10. Termination. This Agreement shall be subject to termination in the absolute discretion of the Representatives, by notice given to the Company prior to delivery of and payment for the Securities, if at any time prior to such delivery and payment (i) trading in the Company's Common Stock shall have been suspended by the SEC or the Nasdaq Global Select Market or trading in securities generally on the New York Stock Exchange or the Nasdaq

Stock Market shall have been suspended or limited or minimum prices shall have been established on either of such exchanges, (ii) a banking moratorium shall have been declared either by Federal or New York State authorities, (iii) there shall have occurred a material disruption in commercial banking or securities settlement or clearance services or (iv) there shall have occurred any outbreak or escalation of hostilities, declaration by the United States of a national emergency or war, or other calamity or crisis the effect of which on financial markets is such as to make it, in the sole judgment of the Representatives, impractical or inadvisable to proceed with the offering or delivery of the Securities as contemplated by any Preliminary Prospectus or the Final Prospectus (exclusive of any amendment or supplement thereto).

11. Representations and Indemnities to Survive. The respective agreements, representations, warranties, indemnities and other statements of the Company or its officers and of the Underwriters set forth in or made pursuant to this Agreement will remain in full force and effect, regardless of any investigation made by or on behalf of any Underwriter or the Company or any of the officers, directors, employees, agents, affiliates or controlling persons referred to in Section 8 hereof, and will survive delivery of and payment for the Securities. The provisions of Sections 7 and 8 hereof shall survive the termination or cancellation of this Agreement.

12. Notices. All communications hereunder will be in writing and effective only on receipt, and, if sent to the Representatives, will be mailed, delivered or telefaxed to Citigroup Global Markets Inc. at 388 Greenwich Street, New York, New York 10013, Attention: General Counsel, facsimile number: +1 (646) 291-1469, and to Leerink Partners LLC at One Federal Street, 37th Floor, Boston, Massachusetts 02110; or, if sent to the Company, will be mailed, delivered or telefaxed to 4242 Campus Point Court, Suite 500, San Diego, California 92121, Attention: Martin J. Duvall, with a copy sent via email to Karen Deschaine Anderson, Cooley LLP, at kanderson@cooley.com.

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

14. Jurisdiction. The Company agrees that any suit, action or proceeding against the Company brought by any Underwriter, the directors, officers, employees, affiliates and agents of any Underwriter, or by any person who controls any Underwriter, arising out of or based upon this Agreement or the transactions contemplated hereby may be instituted in any State or U.S. federal court in The City of New York and County of New York, and waives any objection which it may now or hereafter have to the laying of venue of any such proceeding, and irrevocably submits to the non-exclusive jurisdiction of such courts in any suit, action or proceeding. The Company hereby appoints its Chief Financial Officer as its authorized agent (the "Authorized Agent") upon whom process may be served in any suit, action or proceeding arising out of or based upon this Agreement or the transactions contemplated herein that may be instituted in any State or U.S. federal court in The City of New York and County of New York, by any Underwriter, the directors, officers, employees, affiliates and agents of any Underwriter, or by any person who controls any Underwriter, and expressly accepts the non-exclusive jurisdiction of any such court in respect of any such suit, action or proceeding. The Company

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hereby represents and warrants that the Authorized Agent has accepted such appointment and has agreed to act as said agent for service of process, and the Company agrees to take any and all action, including the filing of any and all documents that may be necessary to continue such appointment in full force and effect as aforesaid. Service of process upon the Authorized Agent shall be deemed, in every respect, effective service of process upon the Company. Notwithstanding the foregoing, any action arising out of or based upon this Agreement may be instituted by any Underwriter, the directors, officers, employees, affiliates and agents of any Underwriter, or by any person who controls any Underwriter, in any court of competent jurisdiction in Delaware.

15. No Fiduciary Duty. The Company hereby acknowledges that (a) 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 Underwriters and any affiliate through which it may be acting, on the other, (b) the Underwriters are acting as principal and not as an agent or fiduciary of the Company and (c) the Company's engagement of the Underwriters in connection with the offering and the process leading up to the offering is as independent contractors and not in any other capacity. Furthermore, the Company agrees that it is solely responsible for making its own judgments in connection with the offering (irrespective of whether any of the Underwriters has advised or is currently advising the Company on related or other matters). The Company agrees that it will not claim that the Underwriters have rendered advisory services of any nature or respect, or owe an agency, fiduciary or similar duty to the Company, in connection with such transaction or the process leading thereto.

16. Integration. 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.

17. Applicable Law. This Agreement will be governed by and construed in accordance with the laws of the State of New York applicable to contracts made and to be performed within the State of New York.

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

19. Counterparts. This Agreement may be signed in one or more counterparts, each of which shall constitute an original and all of which together shall constitute one and the same agreement.

20. Headings. The section headings used herein are for convenience only and shall not affect the construction hereof.

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If the foregoing is in accordance with your understanding of our agreement, please sign and return to us the enclosed duplicate hereof, whereupon this letter and your acceptance shall represent a binding agreement among the Company and the several Underwriters.

Very truly yours,  
Tocagen Inc.

By: /s/ Mark Foletta

Name: Mark Foletta

Title: Executive Vice President, Chief Financial Officer

[ *Signature Page to Underwriting Agreement* ]

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The foregoing Agreement is hereby confirmed and accepted as of the date specified in Schedule I hereto.

Citigroup Global Markets Inc.  
Leerink Partners LLC

By: Citigroup Global Markets Inc.

By: /s/ Bradley Wolff  
Name: Bradley Wolff  
Title: Managing Director, Head of West Coast Life Sciences

By: Leerink Partners LLC

By: /s/ Peter Calveley  
Name: Peter Calveley  
Title: Managing Director

For themselves and the other several Underwriters named in Schedule II to the foregoing Agreement.

[ *Signature Page to Underwriting Agreement* ]

SCHEDULE I

Underwriting Agreement dated December 12, 2018

Registration Statement No. 333-224880

Representatives: Citigroup Global Markets Inc. and Leerink Partners LLC

Title, Purchase Price and Description of Securities:

Title: Common Stock, \$0.001 par value per share

Number of Underwritten Securities to be sold by the Company: 3,000,000

Number of Option Securities to be sold by the Company: 450,000

Price per Share to Public (include accrued dividends, if any): \$10.00

Price per Share to the Underwriters – total: \$9.40

Other provisions: N/A

Closing Date, Time and Location: December 10, 2018 at 10:00 a.m. at 12670 High Bluff Drive, San Diego, California 92130

Type of Offering: Non-Delayed

Date referred to in Section 5(g) after which the Company may offer or sell securities issued by the Company without the consent of the Representatives:  
February 10, 2019

SCHEDULE II

<u>Underwriters</u>	<u>Number of Underwritten Securities to be Purchased</u>
Citigroup Global Markets Inc.	1,560,000
Leerink Partners LLC	1,440,000
Total	<u><u>3,000,000</u></u>

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SCHEDULE III

Schedule of Free Writing Prospectuses included in the Disclosure Package

None

III-1



Tocagen Inc.  
Public Offering of Common Stock

December [ ], 2018

Citigroup Global Markets Inc.  
Leerink Partners LLC

As Representatives of the several Underwriters,

c/o Citigroup Global Markets Inc.  
388 Greenwich Street  
New York, New York 10013

c/o Leerink Partners LLC  
One Federal Street, 37th Floor  
Boston, Massachusetts 02110

Ladies and Gentlemen:

This letter is being delivered to you in connection with the proposed underwriting agreement (the “Underwriting Agreement”), among Tocagen Inc., a Delaware corporation (the “Company”), and each of you as representatives (the “Representatives”) of a group of Underwriters named therein (the “Underwriters”), relating to an underwritten public offering of Common Stock, \$0.001 par value (the “Common Stock”), of the Company (the “Offering”).

In order to induce you and the other Underwriters to enter into the Underwriting Agreement, for a period from the date hereof until 60 days after the date of the Underwriting Agreement (the “Lock-Up Period”), the undersigned will not, without the prior written consent of the Representatives (which consent may be withheld in their sole discretion), on behalf of the Underwriters, directly or indirectly, (i) offer, sell, contract to sell, pledge, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant for the sale of, or otherwise dispose of or transfer (or enter into any transaction which is designed to, or might reasonably be expected to, result in the disposition (whether by actual disposition or effective economic disposition due to cash settlement or otherwise) by the undersigned or any affiliate of the undersigned or any person in privity with the undersigned or any affiliate of the undersigned), including the filing (or participation in the filing) of a registration statement with the Securities and Exchange Commission in respect of, or establish or increase a put equivalent position or liquidate or decrease a call equivalent position within the meaning of Section 16 of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and the rules and regulations of the Securities and Exchange Commission promulgated thereunder with respect to, any shares of capital stock of the Company or any securities convertible into, or exercisable or exchangeable for such capital stock, whether now owned or hereafter acquired by the undersigned or with respect to which the undersigned has or hereafter acquires the power of disposition (collectively, the “Lock-Up Securities”), or publicly announce an intention to effect

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any such transaction, or (ii) enter into any swap or any other agreement or any transaction that transfers, in whole or in part, directly or indirectly, the economic consequence of ownership of the Lock-Up Securities, whether any such swap or transaction is to be settled by delivery of Common Stock or other securities, in cash or otherwise.

Notwithstanding the foregoing, and subject to the conditions below, the undersigned may transfer or otherwise dispose of Lock-Up Securities without the prior written consent of the Representatives, provided, in each case, that (1) in the case of transfers pursuant to clauses (i) – (v) below, the Representatives receive a signed lock-up agreement for the balance of the Lock-Up Period from each donee, trustee, distributee, or transferee, as the case may be, (2) any such transfer shall not involve a disposition for value, and (3) in the case of transfers pursuant to clauses (i) – (vi) below, such transfers are not required to be reported with the Securities and Exchange Commission on Form 4 in accordance with Section 16 of the Exchange Act, and the undersigned does not otherwise voluntarily effect any public filing or report regarding such transfers (other than a filing on a Form 5 made after the expiration of the Lock-Up Period):

- (i) as a *bona fide* gift or gifts;
- (ii) to any trust for the direct or indirect benefit of the undersigned or the immediate family of the undersigned (for purposes of this lock-up agreement, “immediate family” shall mean any relationship by blood, marriage or adoption, not more remote than first cousin);
- (iii) as a distribution or other transfer by a partnership to its partners or former partners or by a limited liability company to its members or retired members or by a corporation to its stockholders or former stockholders or to any wholly-owned subsidiary of such corporation;
- (iv) to the undersigned’s affiliates or to any investment fund or other entity controlled or managed by the undersigned;
- (v) pursuant to a qualified domestic relations order or in connection with a divorce settlement;
- (vi) by will or intestate succession upon the death of the undersigned; or
- (vii) to the Company in satisfaction of any tax withholding obligation.

Furthermore, no provision in this letter shall be deemed to restrict or prohibit (1) the transfer of the undersigned’s Lock-Up Securities to the Company in connection with the termination of the undersigned’s services to the Company, provided that any filing under Section 16 of the Exchange Act made in connection with such transfer shall clearly indicate in the footnotes thereto that the filing relates to the circumstances described in this clause (1); (2) the exercise or exchange by the undersigned of any option or warrant to acquire any shares of Common Stock or options to purchase shares of Common Stock pursuant to any stock option, stock bonus or other stock plan or arrangement; provided, however, that the underlying shares of Common Stock shall continue to be subject to the restrictions on transfer set forth in this letter

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and that any filing under Section 16 of the Exchange Act made in connection with such exercise or exchange shall clearly indicate in the footnotes thereto that (a) the filing relates to the circumstances described in this clause (2) and (b) no shares were sold by the reporting person; and (3) the transfer of Lock-Up Securities upon the completion of a bona fide third-party tender offer, merger, consolidation or other similar transaction made to all holders of the Company's securities involving a change of control of the Company; provided, however, that in the event that such tender offer, merger, consolidation or other such transaction is not completed, such securities held by the undersigned shall remain subject to the restrictions on transfer set forth in this letter.

Notwithstanding anything herein to the contrary, nothing herein shall prevent the undersigned from establishing a 10b5-1 trading plan that complies with Rule 10b5-1 under the Exchange Act ("10b5-1 Trading Plan") or from amending an existing 10b5-1 Trading Plan so long as there are no sales of Lock-Up Securities under any such 10b5-1 Trading Plan during the Lock-Up Period; and provided that, the establishment of a 10b5-1 Trading Plan or the amendment of a 10b5-1 Trading Plan shall only be permitted if (i) the establishment or amendment of such plan is not required to be reported in any public report or filing with the Securities and Exchange Commission, or otherwise and (ii) the undersigned does not otherwise voluntarily effect any public filing or report regarding the establishment or amendment of such plan.

The undersigned also agrees and consents to the entry of stop transfer instructions with the Company's transfer agent and registrar against the transfer of the Lock-Up Securities except in compliance with the foregoing restrictions. This lock-up agreement shall automatically terminate, and the undersigned shall be released from the undersigned's obligations hereunder, upon the earliest to occur, if any, of (i) prior to the execution of the Underwriting Agreement, the Company advises the Representatives in writing that it has determined not to proceed with the Offering, (ii) the Underwriting Agreement is executed but is terminated prior to the closing of the Offering (other than the provisions thereof which survive termination), or (iii) December 21, 2018, in the event that the Underwriting Agreement has not been executed by such date.

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

[SIGNATURE PAGE FOLLOWS]

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Yours very truly,

By: \_\_\_\_\_

Name:

Title:

[Signature Page to Lock-Up-Agreement]



Karen E. Anderson  
+1 858 550 6088  
kanderson@cooley.com

December 12, 2018

Tocagen Inc.  
4242 Campus Point Court, Suite 500  
San Diego, CA 92121

Ladies and Gentlemen:

We have acted as counsel to Tocagen Inc., a Delaware corporation (the “*Company*”), with respect to certain matters in connection with the offering by the Company of up to 3,450,000 shares of its common stock, par value \$0.001 (the “*Shares*”), including up to 450,000 shares that may be sold pursuant to the exercise of an option to purchase additional shares, pursuant to the Registration Statement on Form S-3 (No. 333-224880) (the “*Registration Statement*”) filed with the Securities and Exchange Commission (the “*Commission*”) under the Securities Act of 1933, as amended (the “*Act*”), the prospectus included within the Registration Statement (the “*Base Prospectus*”), and the prospectus supplement dated December 12, 2018 and filed with the Commission pursuant to Rule 424(b) of the Rules and Regulations of the Act (the “*Prospectus Supplement*”). The Base Prospectus and Prospectus Supplement are collectively referred to as the “Prospectus.” All of the Shares are to be sold by the Company as described in the Registration Statement and the Prospectus.

In connection with this opinion, we have examined and relied upon the Registration Statement and the Prospectus, the Company’s Amended and Restated Certificate of Incorporation, its Amended and Restated Bylaws and the originals or copies certified to our satisfaction of such records, documents, certificates, memoranda and other instruments as in our judgment are necessary or appropriate to enable us to render the opinion expressed below.

Our opinion herein is expressed solely with respect to the Delaware General Corporation Law. We express no opinion to the extent that the laws of any other jurisdiction are applicable to the subject matter hereof. We are not rendering any opinion as to compliance with any federal or state antifraud law, rule or regulation relating to securities, or to the sale or issuance thereof.

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.



December 12, 2018

Page Two

We consent to the reference to our firm under the caption “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. This opinion is expressed as of the date hereof, and we disclaim any responsibility to advise you of any changes in the facts stated or assumed herein or of any changes in applicable law.

Sincerely,

Cooley LLP

By: /s/ Karen E. Anderson

Karen E. Anderson

Cooley LLP 4401 Eastgate Mall San Diego, CA 92121  
t: (858) 550-6000 f: (858) 550-6420 cooley.com

**Tocagen Announces Proposed Public Offering of Common Stock**

SAN DIEGO, December 11, 2018 (GLOBE NEWSWIRE) — Tocagen Inc. (Nasdaq: TOCA), a clinical-stage, cancer-selective gene therapy company, today announced that it has commenced an underwritten public offering of 3,000,000 shares of its common stock. All shares of common stock to be sold in the offering will be offered by Tocagen. The offering is subject to market and other conditions, and there can be no assurance as to whether or when the offering may be completed, or as to the actual size or terms of the offering.

Citigroup and Leerink Partners are acting as joint book-running managers for the offering. Tocagen expects to grant the underwriters of the offering a 30-day option to purchase up to an additional 450,000 shares of its common stock at the public offering price, less the underwriting discounts and commissions.

The securities described above are being offered by Tocagen pursuant to a shelf registration statement on Form S-3 filed by Tocagen with the Securities and Exchange Commission (SEC), which was declared effective on May 23, 2018. A preliminary prospectus supplement and accompanying prospectus related to the offering will be filed with the SEC and will be available for free on the SEC's website at <http://www.sec.gov>. Copies of the preliminary prospectus supplement and the accompanying prospectus related to this offering, when available, may be obtained from: Citigroup Global Markets Inc., c/o Broadridge Financial Solutions, 1155 Long Island Avenue, Edgewood, NY 11717, or by telephone at (800) 831-9146; or Leerink Partners LLC, Attention: Syndicate Department, One Federal Street, 37th Floor, Boston, MA 02110, or by telephone at (800) 808-7525, ext. 6132, or by e-mail at [syndicate@leerink.com](mailto:syndicate@leerink.com).

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

**About Tocagen**

Tocagen is a clinical-stage, cancer-selective gene therapy company developing first-in-class, broadly applicable product candidates designed to activate a patient's immune system against their own cancer. Tocagen's lead investigational product candidate, Toca 511 & Toca FC, is under evaluation in a pivotal Phase 3 trial (Toca 5) for recurrent high grade glioma (HGG), a disease with significant unmet medical need. The U.S. Food and Drug Administration awarded Tocagen an orphan drug grant for the Toca 5 trial and has granted Toca 511 & Toca FC Breakthrough Therapy Designation for the treatment of recurrent HGG. The European Medicines Agency has granted Toca 511 PRIME (PRiority MEdicines) designation for the treatment of glioma.

**Cautionary Note on Forward-Looking Statements**

This press release contains forward-looking statements for purposes of the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. This press release may, in some cases, use terms such as "predicts," "believes," "potential," "proposed," "continue," "estimates," "anticipates," "expects," "expected," "plans," "intends," "may," "could," "might," "will," "should" or other words that convey uncertainty of future events or outcomes to identify these forward-looking statements. Forward-looking statements include statements regarding intentions, beliefs, projections, outlook, analyses or current expectations concerning, among other things, the completion and size of Tocagen's public offering and its expectations with respect to granting the underwriters a 30-day option to purchase additional shares.

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Various factors may cause differences between Tocagen's expectations and actual results, including risks and uncertainties associated with market conditions and the satisfaction of customary closing conditions related to the public offering, as well as those discussed in greater detail in Tocagen's filings with the SEC, including without limitation in its Form 10-K for the year ended December 31, 2017 and in its subsequent Form 10-Qs. Any forward-looking statements that are made in this press release speak only as of the date of this press release. Tocagen assumes no obligation to update the forward-looking statements whether as a result of new information, future events or otherwise, after the date of this press release.

Tocagen Media Contact:  
Pam Lord  
Canale Communications  
(619) 849-6003  
[pam@canalecomm.com](mailto:pam@canalecomm.com)

Tocagen Investor Contact:  
Elizabeth Broder  
Endurance Advisors  
[ebroder@enduranceadvisors.com](mailto:ebroder@enduranceadvisors.com)

SOURCE Tocagen Inc.

**Tocagen Announces Pricing of Public Offering of Common Stock**

SAN DIEGO, December 12, 2018 (GLOBE NEWSWIRE) — Tocagen Inc. (Nasdaq: TOCA), a clinical-stage, cancer-selective gene therapy company, today announced the pricing of an underwritten public offering of 3,000,000 shares of its common stock at a price to the public of \$10.00 per share. The gross proceeds from the offering are expected to be approximately \$30.0 million, before deducting the underwriting discounts and commissions and other offering expenses. The offering is expected to close on or about December 17, 2018, subject to customary closing conditions. In addition, the underwriters have been granted a 30-day option to purchase up to an additional 450,000 shares of Tocagen's common stock at the public offering price, less the underwriting discounts and commissions.

Citigroup and Leerink Partners are acting as joint book-running managers for the offering.

The securities described above are being offered by Tocagen pursuant to a shelf registration statement on Form S-3 filed by Tocagen with the Securities and Exchange Commission (SEC), which was declared effective on May 23, 2018. A preliminary prospectus supplement and accompanying prospectus related to the offering was filed with the SEC and is available for free on the SEC's website at <http://www.sec.gov>. Copies of the final prospectus supplement and the accompanying prospectus related to this offering, when available, may be obtained from: Citigroup Global Markets Inc., c/o Broadridge Financial Solutions, 1155 Long Island Avenue, Edgewood, NY 11717, or by telephone at (800) 831-9146; or Leerink Partners LLC, Attention: Syndicate Department, One Federal Street, 37th Floor, Boston, MA 02110, or by telephone at (800) 808-7525, ext. 6132, or by e-mail at [syndicate@leerink.com](mailto:syndicate@leerink.com).

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

**About Tocagen**

Tocagen is a clinical-stage, cancer-selective gene therapy company developing first-in-class, broadly applicable product candidates designed to activate a patient's immune system against their own cancer. Tocagen's lead investigational product candidate, Toca 511 & Toca FC, is under evaluation in a pivotal Phase 3 trial (Toca 5) for recurrent high grade glioma (HGG), a disease with significant unmet medical need. The U.S. Food and Drug Administration awarded Tocagen an orphan drug grant for the Toca 5 trial and has granted Toca 511 & Toca FC Breakthrough Therapy Designation for the treatment of recurrent HGG. The European Medicines Agency has granted Toca 511 PRIME (PRiority MEdicines) designation for the treatment of glioma.

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closing conditions related to the public offering, as well as those discussed in greater detail in Tocagen's filings with the SEC, including without limitation in its Form 10-K for the year ended December 31, 2017 and in its subsequent Form 10-Qs. Any forward-looking statements that are made in this press release speak only as of the date of this press release. Tocagen assumes no obligation to update the forward-looking statements whether as a result of new information, future events or otherwise, after the date of this press release.

Tocagen Media Contact:

Pam Lord

Canale Communications

(619) 849-6003

[pam@canalecomm.com](mailto:pam@canalecomm.com)

Tocagen Investor Contact:

Elizabeth Broder

Endurance Advisors

[ebroder@enduranceadvisors.com](mailto:ebroder@enduranceadvisors.com)

SOURCE Tocagen Inc.