

SECURITIES AND EXCHANGE COMMISSION

FORM S-1/A

General form of registration statement for all companies including face-amount certificate companies [amend]

Filing Date: **2021-04-09**
SEC Accession No. [0001493152-21-008441](#)

([HTML Version](#) on [secdatabase.com](#))

FILER

Protagenic Therapeutics, Inc.\new

CIK: [1022899](#) | IRS No.: [061390025](#) | State of Incorpor.: **DE** | Fiscal Year End: **1231**
Type: **S-1/A** | Act: **33** | File No.: [333-253006](#) | Film No.: **21818463**
SIC: **7389** Business services, nec

Mailing Address
*149 FIFTH AVENUE
SUITE 500
NEW YORK NY 10010*

Business Address
*149 FIFTH AVENUE
SUITE 500
NEW YORK NY 10010
(212) 994-8200*

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

**AMENDMENT NO. 2
TO
FORM S-1**

**REGISTRATION STATEMENT UNDER
THE SECURITIES ACT OF 1933**

Protagenic Therapeutics, Inc.

(Exact Name of Registrant as Specified in its Charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

7389
(Primary Standard Industrial
Classification Code Number)

06-1390025
(I.R.S Employer
Identification No.)

**149 Fifth Avenue
New York, New York 10010
Telephone: 212-994-8200**

*(Address, including zip code, and telephone number,
including area code, of principal executive offices)*

**Garo Armen
Executive Chairman
Protagenic Therapeutics, Inc.
149 Fifth Avenue
New York, New York 10010
Telephone: 212-994-8200**

*(Address, including zip code, and telephone number,
including area code, of agent for service)*

Copies to:

**Dean M. Colucci, Esq.
Michelle Geller, Esq.
Duane Morris LLP
1540 Broadway
New York, NY 10036
Telephone: (973) 424-2020**

**Sara L. Terheggen, Esq.
The NBD Group, Inc.
350 N. Glendale Avenue, Ste B522
Glendale, California 91206
Telephone: (310) 890-0110**

Approximate date of proposed sale to public: As soon as practicable on or after the effective date of this registration statement.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933 check the following box. [X]

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. []

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. []

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. []

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

Large Accelerated filer	[]	Accelerated filer	[]
Non-accelerated filer (Do not check is a smaller reporting company)	[]	Smaller reporting company	[X]
		Emerging Growth Company	[]

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. []

EXPLANATORY NOTE

This Amendment No. 2 (Amendment No. 2) to the Registration Statement on Form S-1 (File No. 333-253006) of Protagenic Therapeutics, Inc. (Registration Statement) is being filed solely for the purpose of filing certain exhibits as indicated in Part II of this Amendment No. 2. This Amendment No. 2 does not modify any provision of the prospectus that forms a part of the Registration Statement. Accordingly, a preliminary prospectus has been omitted.

PART II

ITEM 16. EXHIBIT AND FINANCIAL STATEMENT SCHEDULES

Exhibit No.	Description
1.1*	Form of Underwriting Agreement
3.1	Third Amended and Restated Certificate of Incorporation of Protagenic Therapeutics, Inc. (Incorporated by reference to Exhibit 3.1 to Company’s Current Report on Form 8-K, as filed with the SEC on June 20, 2016).
3.2	Certificate of Designations, Powers, Preferences and Other Rights of Preferred Stock and Qualifications, Limitations and Restrictions Thereof of Series B Convertible Preferred Stock of Atrinsic, Inc. (Incorporated by reference to Exhibit 3.1 to Company’s Current Report on Form 8-K, as filed with the SEC on February 5, 2016.)
3.3	Second Amended and Restated Bylaws Protagenic Therapeutics, Inc., (Incorporated by reference to Exhibit 3.1 to Company’s Current Report on Form 8-K, as filed with the SEC on June 1, 2018).
4.1	Form of Warrant of Protagenic Therapeutics, Inc. (Incorporated by reference to Exhibit 4.1 to Company’s Current Report on Form 8-K, as filed with the SEC on February 12, 2016.)

- 4.2(i) [Warrant of Protagenic Therapeutics, Inc. issued to Garo H. Armen on May 17, 2011. \(Incorporated by reference to Exhibit 4.3\(i\) to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 4.2(ii) [Warrant of Protagenic Therapeutics, Inc. issued to Garo H. Armen on February 18, 2013 \(Incorporated by reference to Exhibit 4.3\(ii\) to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 4.3(i) [Warrant of Protagenic Therapeutics, Inc. issued to Gregory H. Ekizian on July 7, 2011. \(Incorporated by reference to Exhibit 4.4\(i\) to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 4.3(ii) [Warrant of Protagenic Therapeutics, Inc. issued to PENSICO Trust Company, FBO Gregory H. Ekizian on February 18, 2013. \(Incorporated by reference to Exhibit 4.4\(ii\) to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 4.4 [Form of Placement Agent Warrant \(Incorporated by reference to Exhibit 4.5 to Company's Current Report on Form 8-K, as filed with the SEC on April 18, 2016\).](#)
- 4.5* [Form of Warrant \(included in Exhibit 10.15\)](#)
- 5.1* [Opinion of Duane Morris LLP](#)
- 10.1 [Employment Agreement, effective January 1, 2014 between Protagenic Therapeutics Canada \(2006\) Inc. and Dr. Robert Ziroyan \(Incorporated by reference to Exhibit 10.12 to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 10.2 [Consulting Agreement, effective December 18, 2020, between Protagenic Therapeutics Inc. and Dr. Andrew Slee \(Incorporated by reference to Exhibit 10.2 to Company's Annual Report on Form 10-K, as filed with the SEC on March 24, 2021\)](#)
- 10.3 [Consulting Agreement, as amended, between Protagenic Therapeutics Canada \(2006\) Inc. and Dr. Dalia Barsyte \(Incorporated by reference to Exhibit 10.13 to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 10.4 [Amended and Restated Consulting Agreement, effective December 18, 2020, between Protagenic Therapeutics Inc. and Dr. Robert B. Stein \(Incorporated by reference to Exhibit 10.2 to Company's Annual Report on Form 10-K, as filed with the SEC on March 24, 2021\)](#)
- 10.5 [Protagenic Therapeutics, Inc. 2006 Employee, Director and Consultant Stock Plan \(Incorporated by reference to Exhibit 10.16 to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 10.6 [Form of Nonqualified Stock Option Award Agreement under the 2006 Employee, Director and Consultant Stock Plan. \(Incorporated by reference to Exhibit 10.17 to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 10.7(i) [Technology License Agreement, effective July 21, 2005, between The University of Toronto Innovations Foundation and Protagenic Therapeutics, Inc. \(Incorporated by reference to Exhibit 10.19\(i\) to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 10.7(ii) [First Amendment to Technology License Agreement, effective February 18, 2015, between the Governing Council of the University of Toronto and Protagenic Therapeutics, Inc. \(Incorporated by reference to Exhibit 10.19\(ii\) to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 10.8(i) [Sponsored Research Agreement, effective April 1, 2014, between the Governing Council of the University of Toronto and Protagenic Therapeutics Canada \(2006\), Inc., Protagenic Therapeutics, Inc. \(Incorporated by reference to Exhibit 10.20\(i\) to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)
- 10.8(ii) [Amendment to the Sponsored Research Agreement, effective April 1, 2015, between the Governing Council of the University of Toronto and Protagenic Therapeutics Canada \(2006\), Inc., Protagenic Therapeutics, Inc. \(Incorporated by reference to Exhibit 10.20\(ii\) to Company's Current Report on Form 8-K, as filed with the SEC on February 12, 2016.\)](#)

- 10.9 [Protagenic Therapeutics, Inc. 2016 Equity Compensation Plan. \(Incorporated by reference to Exhibit 10.1 to Company's Current Report on Form 8-K, as filed with the SEC on June 20, 2016.\)](#)
- 10.10 [Form of Incentive Stock Option Agreement under the Protagenic Therapeutics, Inc. 2016 Equity Compensation Plan. \(Incorporated by reference to Exhibit 10.2 to Company's Current Report on Form 8-K, as filed with the SEC on June 20, 2016.\)](#)
- 10.11 [Form of Nonqualified Stock Option Grant Agreement under the Protagenic Therapeutics, Inc. 2016 Equity Compensation Plan. \(Incorporated by reference to Exhibit 10.3 to Company's Current Report on Form 8-K, as filed with the SEC on June 20, 2016.\)](#)
-
- 10.12 [Form of Convertible Note Purchase Agreement \(Incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K, as filed with the SEC on November 21, 2019\)](#)
- 10.13 [Form of Convertible Promissory Note \(Incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K, as filed with the SEC on November 21, 2019\)](#)
- 10.14 [Form of Guaranty \(Incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K, as filed with the SEC on November 21, 2019\)](#)
- 10.15* [Form of Warrant Agent Agreement](#)
- 14.1 [Protagenic Therapeutics, Inc. Code of Business Conduct and Ethics \(incorporated by reference to Exhibit 14.1 to the Current Report on Form 10-K, as filed with the SEC on April 18, 2017\).](#)
- 14.2 [Protagenic Therapeutics, Inc. Guideline on Significant Corporate Governance Issues \(incorporated by reference to Exhibit 14.2 to the Current Report on Form 10-K, as filed with the SEC on April 18, 2017\).](#)
- 14.3 [Protagenic Therapeutics, Inc. Process for Security Holder Communications with Directors \(incorporated by reference to Exhibit 14.3 to the Current Report on Form 10-K, as filed with the SEC on April 18, 2017\).](#)
- 21.1 [Subsidiaries \(Incorporated by reference to Exhibit 10.2 to Company's Annual Report on Form 10-K, as filed with the SEC on March 24, 2021\)](#)
- 23.1** [Consent of MaloneBailey, LLP](#)
- 24.1** [Power of Attorney \(contained on the signature pages to Registration Statement on Form S-1\)](#)
- 99.1 [Audit Committee Charter adopted by the Board of Directors of Protagenic Therapeutics, Inc. on March 7, 2017. \(Incorporated by reference to Exhibit 99.1 to Company's Annual Report on Form 10-K, as filed with the SEC on March 24, 2021.\)](#)
- 99.2 [Compensation Committee Charter adopted by the Board of Directors of Protagenic Therapeutics, Inc. on March 7, 2017. \(Incorporated by reference to Exhibit 99.2 to Company's Annual Report on Form 10-K, as filed with the SEC on March 24, 2021.\)](#)
- 99.3 [Governance and Nominating Committee Charter adopted by the Board of Directors of Protagenic Therapeutics, Inc. on March 7, 2017. \(Incorporated by reference to Exhibit 99.3 to Company's Annual Report on Form 10-K, as filed with the SEC on March 24, 2021.\)](#)
- 99.4 [Science Committee Charter adopted by the Board of Directors of Protagenic Therapeutics, Inc. \(Incorporated by reference to Exhibit 99.1 to the Company's Annual Report on Form 10-K, as filed with the SEC on April 29, 2020\)](#)
- 99.5* [Clinical & Regulatory Committee Charter adopted by the Board of Directors of Protagenic Therapeutics, Inc.](#)

* Filed herewith.

** Previously filed with the Commission alongside previous amendment filed on April 7, 2021.

ITEM 17. UNDERTAKINGS

(A) The undersigned registrant hereby undertakes:

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

(i) To include any prospectus required by section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increases or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement;

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

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

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

(i) If the registrant is relying on Rule 430B:

(A) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(B) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date; or

(ii) If the registrant is subject to Rule 430C, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a

purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(6) To provide to the underwriters at the closing specified in the underwriting agreements certificates in such denominations and registered in such names as required by the underwriters to permit prompt delivery to each purchaser.

(B) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question of whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

(C) The undersigned registrant hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act of 1933, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act of 1933, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of New York, State of New York, on this 9th day of April, 2021.

PROTAGENIC THERAPEUTICS, INC.

By: */s/ Garo H. Armen*

Garo H. Armen
Chairman
(Principal Executive Officer and
Duly Authorized Officer)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS that each individual whose signature appears below constitutes and appoints Garo H. Armen as his or her true and lawful attorney-in-fact and agent, with full power of substitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign this registration statement and any and all amendments thereto, including post-effective amendments, and to file the same, with all exhibits thereto, any related registration filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent, full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all the said attorney-in-fact and agent or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

<u>Signatures</u>	<u>Title</u>	<u>Date</u>
<u><i>/s/ Garo H. Armen</i></u> Garo H. Armen	Director and Chairman of the Board (Principal Executive Officer)	April 9, 2021
<u><i>/s/ Alexander K. Arrow</i></u> Alexander K. Arrow	Chief Financial Officer (Principal Financial Officer)	April 9, 2021
<u><i>/s/ Robert B. Stein</i></u> Robert B. Stein	Director	April 9, 2021
<u><i>/s/ Khalil Barrage</i></u> Khalil Barrage	Director	April 9, 2021
<u><i>/s/ Brian Corvese</i></u> Brian Corvese	Director	April 9, 2021
<u><i>/s/ Jennifer Buell</i></u> Jennifer Buell	Director	April 9, 2021
<u><i>/s/ Joshua Silverman</i></u> Joshua Silverman	Director	April 9, 2021

UNDERWRITING AGREEMENT

between

PROTAGENIC THERAPEUTICS, INC.

and

KINGSWOOD CAPITAL MARKETS,
division of Benchmark Investments, Inc.,
as Representative of the Several Underwriters

PROTAGENIC THERAPEUTICS, INC.

UNDERWRITING AGREEMENT

New York, New York
[____], 2021

KINGSWOOD CAPITAL MARKETS,
division of Benchmark Investments, Inc.
as Representative of the several Underwriters named on Schedule 1 attached hereto
17 Battery Place, Suite 625
New York, New York 10004

Ladies and Gentlemen:

The undersigned, Protagenic Therapeutics, Inc., a corporation formed under the laws of the State of Delaware (the “**Company**”), hereby confirms its agreement (this “**Agreement**”) with Kingswood Capital Markets, division of Benchmark Investments, Inc. (hereinafter referred to as “you” (including its correlatives) or the “**Representative**”), and with the other underwriters named on Schedule 1 hereto for which the Representative is acting as representative (the Representative and such other underwriters being collectively called the “**Underwriters**” or, individually, an “**Underwriter**”) as follows:

1. Purchase and Sale of Shares.

1.1 Firm Securities.

1.1.1. Nature and Purchase of Firm Securities.

(i) On the basis of the representations and warranties herein contained, but subject to the terms and conditions herein set forth, the Company agrees to issue and sell to the several Underwriters, an aggregate of [____] shares (“**Firm Shares**”) of the Company’s common stock, par value \$0.0001 per share (the “**Common Stock**”), together with Warrants to purchase an aggregate of [____] shares of Common Stock, in the form filed as an exhibit to the Registration Statement (as hereinafter defined) (the “**Firm Warrants**”, and collectively with the Common Stock, the “**Firm Securities**”).

(ii) Each Firm Share will be sold together with one Firm Warrant and will be immediately separable upon issuance. The Underwriters, severally and not jointly, agree to purchase from the Company the number of Firm Shares and accompanying Firm Warrants set forth opposite their respective names on Schedule 1 attached hereto and made a part hereof at a purchase price of \$[____] per Firm Share and accompanying Firm Warrant (92% of the public offering price for each Firm Share and accompanying Firm

Warrant). The Firm Securities are to be offered initially to the public at the offering price set forth on the cover page of the Prospectus (as defined in Section 2.1.1 hereof).

1.1.2. Firm Shares Payment and Delivery.

(i) Delivery and payment for the Firm Securities shall be made at [10:00 a.m.], Eastern time, on the second (2nd) Business Day following the effective date (the “**Effective Date**”) of the Registration Statement (as defined in Section 2.1.1 below) (or the third (3rd) Business Day following the Effective Date if the Registration Statement is declared effective after 4:01 p.m., Eastern time) or at such earlier time as shall be agreed upon by the Representative and the Company, at the offices of The NBD Group, Inc., 350 N. Glendale Ave SteB522, Glendale, California 91206 (“**Representative Counsel**”), or at such other place (or remotely by facsimile or other electronic transmission) as shall be agreed upon by the Representative and the Company. The hour and date of delivery and payment for the Firm Securities is called the “**Closing Date**.”

(ii) Payment for the Firm Securities shall be made on the Closing Date by wire transfer in Federal (same day) funds, payable to the order of the Company upon delivery of the certificates (in form and substance satisfactory to the Underwriters) representing the Firm Securities (or through the facilities of the Depository Trust Company (“**DTC**”)) for the account of the Underwriters. The Firm Securities shall be registered in such name or names and in such authorized denominations as the Representative may request in writing at least two (2) full Business Days prior to the Closing Date. The Company shall not be obligated to sell or deliver the Firm Securities except upon tender of payment by the Representative for all of the Firm Securities. The term “**Business Day**” means any day other than a Saturday, a Sunday or a legal holiday or a day on which banking institutions are authorized or obligated by law to close in New York, New York.

1.2 Over-allotment Option.

1.2.1. Option Securities. For the purposes of covering any over-allotments in connection with the distribution and sale of the Firm Securities, the Company hereby grants to the Underwriters an option to purchase up to [_____] additional shares of Common Stock (the “**Option Shares**”) and accompanying Warrants to purchase an aggregate of [_____] shares of Common Stock (the “**Option Warrants**”, and collectively with the Option Shares, the “**Option Securities**”), representing fifteen percent (15%) of the Firm Shares and Firm Warrants sold in the offering, from the Company (the “**Over-allotment Option**”). The purchase price to be paid per Option Share and accompanying Option Warrant shall be equal to the purchase price per Firm Share and accompanying Firm Warrant set forth in Section 1.1.1 hereof. The shares of Common Stock into which the Warrants are exercisable are hereinafter referred to as the “**Warrant Shares**.” The Firm Securities and the Option Securities are collectively referred to as the “**Primary Securities**.” The Primary Securities and Warrant Shares are hereinafter collectively referred to as the “**Public Securities**.” The offering and sale of the Primary Securities is herein referred to as the “**Offering**.”

1.2.2. Exercise of Option. The Over-allotment Option granted pursuant to Section 1.2.1 hereof may be exercised by the Representative as to all (at any time) or any part (from time to time) of the Option Securities within 45 days after the Effective Date. The Underwriters shall not be under any obligation to purchase any Option Securities prior to the exercise of the Over-allotment Option. The Over-allotment Option granted hereby may be exercised by the giving of oral notice to the Company from the Representative, which must be confirmed in writing by overnight mail or facsimile or other electronic transmission setting forth the number of Option Shares and accompanying Option Warrants to be purchased and the date and time for delivery of and payment for the Option Securities (the “**Option Closing Date**”), which shall not be later than one (1) full Business Day after the date of the notice or such other time as shall be agreed upon by the Company and the Representative, at the offices of Representative Counsel or at such other place (including remotely by facsimile or other electronic transmission) as shall be agreed upon by the Company and the Representative. If such delivery and payment for the Option Securities does not occur on the Closing Date, the Option Closing Date will be as set forth in the notice. Upon exercise of the Over-allotment Option with respect to all or any portion of the Option Securities, subject to the terms and conditions set forth herein, (i) the Company shall become obligated to sell to the Underwriters the number of Option Shares and accompanying Option Warrants specified in such notice and (ii) each of the Underwriters, acting severally and not jointly, shall purchase that portion of the total number of Option Shares and accompanying Option Warrants then being purchased as set forth on Schedule 1 opposite the name of such.

1.2.3. Payment and Delivery. Payment for the Option Securities shall be made on the Option Closing Date by wire transfer in Federal (same day) funds, payable to the order of the Company upon delivery to you of certificates (in form and substance satisfactory to the Underwriters) representing the Option Shares and accompanying Option Warrants (or through the facilities of DTC) for the account of the Underwriters. The Option Securities shall be registered in such name or names and in such authorized denominations

as the Representative may request in writing at least one (1) full Business Day prior to the Option Closing Date. The Company shall not be obligated to sell or deliver the Option Securities except upon tender of payment by the Representative for applicable Option Securities.

1.3 Representative's Restricted Securities.

1.3.1. Restricted Securities. The Company hereby agrees to issue to the Representative (and/or its designees) [_____] shares of Common Stock on the Closing Date and [_____] shares of Common Stock on the Option Closing Date if the Over-Allotment Option is exercised, in the aggregate, representing 2.5% of the Securities (the "**Representative Shares**"). The Representative understands and agrees that there are significant restrictions pursuant to FINRA Rule 5110 against transferring the Representative Shares during the one hundred eighty (180) day period after the Effective Date and by its acceptance thereof shall agree that it will not sell, transfer, assign, pledge or hypothecate the Representative Shares, or any portion thereof, or be the subject of any hedging, short sale, derivative, put or call transaction that would result in the effective economic disposition of such securities for a period of one hundred eighty (180) days following the Effective Date to anyone other than (i) an Underwriter or a selected dealer in connection with the Offering, or (ii) a bona fide officer or partner of the Representative or of any such Underwriter or selected dealer; and only if any such transferee agrees to the foregoing lock-up restrictions. The Representative Shares shall contain legends to reflect the above FINRA and contractual transfer restrictions.

1.3.2. Delivery. Delivery of the Representative Shares shall be made on the Closing Date and/or Option Closing Date, as applicable, and shall be issued in the name or names and in such authorized denominations as the Representative may request.

2. Representations and Warranties of the Company. The Company represents and warrants to the Underwriters as of the Applicable Time (as defined below), as of the Closing Date and as of the Option Closing Date, if any, as follows:

2.1 Filing of Registration Statement.

2.1.1. Pursuant to the Securities Act. The Company has filed with the U.S. Securities and Exchange Commission (the "**Commission**") a registration statement, and an amendment or amendments thereto, on Form S-1 (File No. 333-253006), including any related prospectus or prospectuses, for the registration of the Public Securities and the Representative Shares under the Securities Act of 1933, as amended (the "**Securities Act**"), which registration statement and amendment or amendments have been prepared by the Company in all material respects in conformity with the requirements of the Securities Act and the rules and regulations of the Commission under the Securities Act (the "**Securities Act Regulations**") and will contain all material statements that are required to be stated therein in accordance with the Securities Act and the Securities Act Regulations. Except as the context may otherwise require, such registration statement, as amended, on file with the Commission at the time the registration statement became effective (including the Preliminary Prospectus included in the registration statement, financial statements, schedules, exhibits and all other documents filed as a part thereof or incorporated therein and all information deemed to be a part thereof as of the Effective Date pursuant to paragraph (b) of Rule 430A of the Securities Act Regulations (the "**Rule 430A Information**")), is referred to herein as the "**Registration Statement**." If the Company files any registration statement pursuant to Rule 462(b) of the Securities Act Regulations, then after such filing, the term "**Registration Statement**" shall include such registration statement filed pursuant to Rule 462(b). The Registration Statement has been declared effective by the Commission on the date hereof.

Each prospectus used prior to the effectiveness of the Registration Statement, and each prospectus that omitted the Rule 430A Information that was used after such effectiveness and prior to the execution and delivery of this Agreement, is herein called a "**Preliminary Prospectus**." The Preliminary Prospectus, subject to completion, dated [____], 2021, that was included in the Registration Statement immediately prior to the Applicable Time is hereinafter called the "**Pricing Prospectus**." The final prospectus in the form first furnished to the Underwriters for use in the Offering is hereinafter called the "**Prospectus**." Any reference to the "most recent Preliminary Prospectus" shall be deemed to refer to the latest Preliminary Prospectus included in the Registration Statement.

"**Applicable Time**" means [7:00] p.m., Eastern time, on the date of this Agreement.

"**Issuer Free Writing Prospectus**" means any "issuer free writing prospectus," as defined in Rule 433 of the Securities Act Regulations ("**Rule 433**"), including without limitation any "free writing prospectus" (as defined in Rule 405 of the Securities Act Regulations) relating to the Public Securities that is (i) required to be filed with the Commission by the Company, (ii) a "road show that

is a written communication” within the meaning of Rule 433(d)(8)(i), whether or not required to be filed with the Commission, or (iii) exempt from filing with the Commission pursuant to Rule 433(d)(5)(i) because it contains a description of the Public Securities or of the Offering that does not reflect the final terms, in each case in the form filed or required to be filed with the Commission or, if not required to be filed, in the form retained in the Company’s records pursuant to Rule 433(g).

“**Issuer General Use Free Writing Prospectus**” means any Issuer Free Writing Prospectus that is intended for general distribution to prospective investors (other than a “*bona fide* electronic road show,” as defined in Rule 433 (the “**Bona Fide Electronic Road Show**”)), as evidenced by its being specified in Schedule 2-B hereto.

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

“**Pricing Disclosure Package**” means any Issuer General Use Free Writing Prospectus issued at or prior to the Applicable Time, the Pricing Prospectus and the information included on Schedule 2-A hereto, all considered together.

2.1.2. Pursuant to the Exchange Act. The Company has filed with the Commission a Form 8-A (File Number 001-[____]) providing for the registration of the Common Stock and the Warrants. The Common Stock and Warrants are registered pursuant to Section 12(b) under the Securities Exchange Act of 1934, as amended (the “**Exchange Act**”). The registration of the shares of Common Stock and Warrants under the Exchange Act have been declared effective by the Commission on or prior to the date hereof. The Company has taken no action designed to, or reasonably likely to have the effect of, terminating the registration of the shares of Common Stock and the Warrants under the Exchange Act, nor has the Company received any notification that the Commission is contemplating terminating such registration.

2.2 Stock Exchange Listing. The shares of Common Stock and Warrants have each been approved for listing on The Nasdaq Capital Market (the “**Exchange**”), subject only to official notice of issuance, and the Company has taken no action designed to, or reasonably likely to have the effect of, delisting the shares of Common Stock or Warrants from the Exchange, nor has the Company received any notification that the Exchange is contemplating terminating such listing except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

2.3 No Stop Orders, etc. Neither the Commission nor, to the Company’s knowledge, any state regulatory authority has issued any order preventing or suspending the use of the Registration Statement, any Preliminary Prospectus or the Prospectus or has instituted or, to the Company’s knowledge, threatened to institute, any proceedings with respect to such an order. The Company has complied with each request (if any) from the Commission for additional information.

2.4 Disclosures in Registration Statement.

2.4.1. Compliance with Securities Act and 10b-5 Representation.

(i) Each of the Registration Statement and any post-effective amendment thereto, at the time it became effective, complied in all material respects with the requirements of the Securities Act and the Securities Act Regulations. Each Preliminary Prospectus, including the prospectus filed as part of the Registration Statement as originally filed or as part of any amendment or supplement thereto, and the Prospectus, at the time each was filed with the Commission, complied in all material respects with the requirements of the Securities Act and the Securities Act Regulations. Each Preliminary Prospectus delivered to the Underwriters for use in connection with this Offering and the Prospectus was or will be identical to the electronically transmitted copies thereof filed with the Commission pursuant to the Commission’s EDGAR filing system (“**EDGAR**”), except to the extent permitted by Regulation S-T promulgated under the Securities Act (“**Regulation S-T**”).

4

(ii) Neither the Registration Statement nor any amendment thereto, at its effective time, as of the Applicable Time, at the Closing Date or at any Option Closing Date (if any), contained, contains or will contain an untrue statement of a material fact or omitted, omits or will omit to state a material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading.

(iii) The Pricing Disclosure Package, as of the Applicable Time, at the Closing Date and at any Option Closing Date (if any), did not, does not and will not include an 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; and each Issuer Limited

Use Free Writing Prospectus hereto does not conflict in any material respect with the information contained in the Registration Statement, any Preliminary Prospectus, the Pricing Prospectus or the Prospectus, and each such Issuer Limited Use Free Writing Prospectus, as supplemented by and taken together with the Pricing Prospectus as of the Applicable Time, did not include an 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 this representation and warranty shall not apply to statements made or statements omitted in reliance upon and in conformity with written information furnished to the Company with respect to the Underwriters by the Representative expressly for use in the Registration Statement, the Pricing Disclosure Package or the Prospectus or any amendment thereof or supplement thereto. The parties acknowledge and agree that such information provided by or on behalf of any Underwriter consists solely of the following disclosure contained in the “Underwriting” section of the Prospectus: (i) the table showing the number of securities to be purchased by each Underwriter, (ii) the fourth full paragraph, (iii) the second and third sentences of the second paragraph under the heading “Discounts, Commissions and Expenses” and (iv) the sub-sections titled “Price Stabilization, Short Positions and Penalty Bids,” “Electronic Distribution,” and “Other” (the “**Underwriters’ Information**”).

(iv) Neither the Prospectus nor any amendment or supplement thereto (including any prospectus wrapper), as of its issue date, at the time of any filing with the Commission pursuant to Rule 424(b), at the Closing Date or at any Option Closing Date, included, includes or will include an untrue statement of a material fact or omitted, omits or will 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 this representation and warranty shall not apply to the Underwriters’ Information.

2.4.2. Disclosure of Agreements. The agreements and documents described in the Registration Statement, the Pricing Disclosure Package and the Prospectus conform in all material respects to the descriptions thereof contained therein and, to the Company’s knowledge, there are no agreements or other documents required by the Securities Act and the Securities Act Regulations to be described in the Registration Statement, the Pricing Disclosure Package and the Prospectus or to be filed with the Commission as exhibits to the Registration Statement, that have not been so described or filed. Each agreement or other instrument (however characterized or described) to which the Company is a party or by which it is or may be bound or affected and (i) that is referred to in the Registration Statement, the Pricing Disclosure Package and the Prospectus, or (ii) is material to the Company’s business, has been duly authorized and validly executed by the Company, is in full force and effect in all material respects and is enforceable against the Company and, to the Company’s knowledge, the other parties thereto, in accordance with its terms, except (x) as such enforceability may be limited by bankruptcy, insolvency, reorganization or similar laws affecting creditors’ rights generally, (y) as enforceability of any indemnification or contribution provision may be limited under the federal and state securities laws, and (z) that the remedy of specific performance and injunctive and other forms of equitable relief may be subject to the equitable defenses and to the discretion of the court before which any proceeding therefor may be brought. None of such agreements or instruments has been assigned by the Company, and neither the Company nor, to the Company’s knowledge, any other party is in default thereunder and, to the Company’s knowledge, no event has occurred that, with the lapse of time or the giving of notice, or both, would constitute a default thereunder except for such defaults that would not reasonably be expected to result in a Material Adverse Change (as defined in Section 2.5.1 below). To the Company’s knowledge, performance by the Company of the material provisions of such agreements or instruments will not result in a violation of any existing applicable law, rule, regulation, judgment, order or decree of any governmental or regulatory agency, authority, body, entity or court, domestic or foreign, having jurisdiction over the Company or any of its assets or businesses (each, a “**Governmental Entity**”), including, without limitation, those relating to environmental laws and regulations.

2.4.3. Prior Securities Transactions. No securities of the Company have been sold by the Company or by or on behalf of, or for the benefit of, any person or persons controlling, controlled by or under common control with the Company, except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Preliminary Prospectus.

2.4.4. Regulations. The disclosures in the Registration Statement, the Pricing Disclosure Package and the Prospectus concerning the effects of federal, state, local and all foreign laws, rules and regulations relating to the Offering and the Company’s business as currently conducted or contemplated are correct and complete in all material respects and no other such laws, rules or regulations are required to be disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus which are not so disclosed.

2.4.5. No Other Distribution of Offering Materials. The Company has not, directly or indirectly, distributed and will not distribute any offering material in connection with the Offering other than any Preliminary Prospectus, Pricing Prospectus, any Issuer Free Writing Prospectus, the Prospectus and other materials, if any, permitted under the Securities Act and consistent with Section 3.2 below.

2.5 Changes After Dates in Registration Statement.

2.5.1. No Material Adverse Change. Since the respective dates as of which information is given in the Registration Statement, the Pricing Disclosure Package and the Prospectus, except as otherwise specifically stated therein: (i) there has been no material adverse change in the financial position or results of operations of the Company or its Subsidiaries taken as a whole, nor to the Company's knowledge any change or development that, singularly or in the aggregate, would involve a material adverse change or would reasonably be expected to have a material adverse change, in or affecting the condition (financial or otherwise), results of operations, business, assets or prospects of the Company or its Subsidiaries taken as a whole (a "**Material Adverse Change**"); (ii) there have been no material transactions entered into by the Company or its Subsidiaries, other than as contemplated pursuant to this Agreement; and (iii) no executive officer or director of the Company has resigned from any position with the Company.

2.5.2. Recent Securities Transactions, etc. Subsequent to the respective dates as of which information is given in the Registration Statement, the Pricing Disclosure Package and the Prospectus, and except as may otherwise be indicated or contemplated herein or disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company has not: (i) issued any securities or incurred any liability or obligation, direct or contingent, for borrowed money; or (ii) declared or paid any dividend or made any other distribution on or in respect to its capital stock.

2.6 Disclosures in Commission Filings. None of the Company's filings with, or other documents furnished to, the Commission contained any untrue statement of a material fact or omitted to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading.

2.7 Independent Accountants. To the knowledge of the Company, MaloneBailey LLP (the "**Auditor**"), whose report is filed with the Commission as part of the Registration Statement, the Pricing Disclosure Package and the Prospectus, is an independent registered public accounting firm as required by the Securities Act and the Securities Act Regulations and the Public Company Accounting Oversight Board. The Auditor has not, during the periods covered by the financial statements included in the Registration Statement, the Pricing Disclosure Package and the Prospectus, provided to the Company any non-audit services, as such term is used in Section 10A(g) of the Exchange Act.

2.8 Financial Statements, etc. The financial statements, including the notes thereto and supporting schedules included in the Registration Statement, the Pricing Disclosure Package and the Prospectus, fairly present in all material respects the financial position and the results of operations of the Company at the dates and for the periods stated therein; and such financial statements have been prepared in conformity with U.S. generally accepted accounting principles ("**GAAP**"), consistently applied throughout the periods involved (provided that unaudited interim financial statements are subject to year-end audit adjustments that are not expected to be material in the aggregate and do not contain all footnotes required by GAAP); and the supporting schedules, if any, included in the Registration Statement present fairly in all material respects the information required to be stated therein. Except as included therein, no historical or pro forma financial statements are required to be included in the Registration Statement, the Pricing Disclosure Package or the Prospectus under the Securities Act or the Securities Act Regulations. The as adjusted financial information and the related notes, if any, included in the Registration Statement, the Pricing Disclosure Package and the Prospectus have been properly compiled and prepared in accordance with the applicable requirements of the Securities Act and the Securities Act Regulations and present fairly in all material respects the information shown therein, and the assumptions used in the preparation thereof are reasonable and the adjustments used therein are appropriate to give effect to the transactions and circumstances referred to therein. All disclosures contained in the Registration Statement, the Pricing Disclosure Package or the Prospectus regarding "non-GAAP financial measures" (as such term is defined by the rules and regulations of the Commission), if any, comply with Regulation G of the Exchange Act and Item 10 of Regulation S-K of the Securities Act, to the extent applicable. Each of the Registration Statement, the Pricing Disclosure Package and the Prospectus discloses all material off-balance sheet transactions, arrangements, obligations (including contingent obligations), and other relationships of the Company with unconsolidated entities or other persons that may have a material current or future effect on the Company's financial condition, changes in financial condition, results of operations, liquidity, capital expenditures, capital resources, or significant components of revenues or expenses. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, (a) since the date of the last balance sheet included in the Registration Statement, the Pricing Disclosure Package and the Prospectus, neither the Company nor any of its direct and indirect subsidiaries, including each entity disclosed or described in the Registration Statement, the Pricing Disclosure Package and the Prospectus as being a subsidiary of the Company (each, a "**Subsidiary**" and, collectively, the "**Subsidiaries**"), has incurred any material liabilities or obligations, direct or contingent, or entered into any material transactions other than in the ordinary course of business, (b) the Company has not declared or paid any dividends or made any distribution of any kind with respect to its capital stock, (c) there has not been any change in the capital stock of the Company or any of its Subsidiaries, or, other than in the ordinary course of business, any grants under any stock compensation plan, and (d) there has not been any material adverse change in the Company's long-term or short-term debt. The Company represents that it has no direct or indirect subsidiaries other than those listed in Exhibit 21.1 to the Registration Statement.

2.9 Authorized Capital; Options, etc. The Company had, at the date or dates indicated in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the duly authorized, issued and outstanding capitalization as set forth therein. Based on the assumptions stated in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company will have on the Closing Date the adjusted capitalization set forth therein. Except as disclosed in, or contemplated by, the Registration Statement, the Pricing Disclosure Package and the Prospectus, on the Effective Date, as of the Applicable Time and on the Closing Date and any Option Closing Date, there will be no stock options, warrants, or other rights to purchase or otherwise acquire any authorized, but unissued shares of Common Stock of the Company or any security convertible or exercisable into shares of Common Stock of the Company, or any contracts or commitments to issue or sell shares of Common Stock or any such options, warrants, rights or convertible securities.

2.10 Valid Issuance of Securities, etc.

2.10.1. Outstanding Securities. All issued and outstanding securities of the Company issued prior to the transactions contemplated by this Agreement have been duly authorized and validly issued and are fully paid and non-assessable; the holders thereof have no contractual rights of rescission or the ability to force the Company to repurchase such securities with respect thereto, and are not subject to personal liability by reason of being such holders; and none of such securities were issued in violation of the preemptive rights, rights of first refusal or rights of participation of any holders of any security of the Company or similar contractual rights granted by the Company. The authorized shares of Common Stock conform in all material respects to all statements relating thereto contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus. The offers and sales of the outstanding shares of Common Stock, options, warrants and other rights to purchase or exchange such securities for shares of the Common Stock were at all relevant times either registered under the Securities Act and the applicable state securities or “blue sky” laws or, based in part on the representations and warranties of the purchasers of such shares of Common Stock, exempt from such registration requirements. The description of the Company’s stock option, stock bonus and other stock plans or arrangements, and the options or other rights granted thereunder, as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, accurately and fairly present, in all material respects, the information required to be shown with respect to such plans, arrangements, options and rights.

2.10.2. Securities Sold Pursuant to this Agreement. The Public Securities and Representative Shares have been duly authorized for issuance and sale and, when issued and paid for in accordance with the terms of this Agreement, will be validly issued, fully paid and non-assessable; the holders thereof are not and will not be subject to personal liability by reason of being such holders; the Public Securities and Representative Shares are not and will not be subject to the preemptive rights of any holders of any security of the Company or similar contractual rights granted by the Company; and all corporate action required to be taken for the authorization, issuance and sale of the Public Securities and Representative Shares has been duly and validly taken. The Warrants, when issued and paid for pursuant to this Agreement and the Warrant Agency Agreement (as defined below), will constitute valid and binding obligations of the Company to issue and sell, upon exercise thereof and payment therefor, the Warrant Shares. The Public Securities and Representative Shares conform in all material respects to all statements with respect thereto contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus. All corporate action required to be taken for the authorization, issuance and sale of the Representative Shares has been duly and validly taken; the holders thereof are not and will not be subject to personal liability by reason of being such holders; and such shares of Common Stock are not and will not be subject to the preemptive rights of any holders of any security of the Company or similar contractual rights granted by the Company.

2.11 Registration Rights of Third Parties. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, no holders of any securities of the Company or any options, warrants, rights or other securities exercisable for or convertible or exchangeable into securities of the Company have the right to require the Company to register any such securities of the Company under the Securities Act or to include any such securities in the Registration Statement or any other registration statement to be filed by the Company.

2.12 Validity and Binding Effect of Agreements. The execution, delivery and performance of this Agreement and the Warrants have been duly and validly authorized by the Company, and, when executed and delivered, will constitute, the valid and binding agreements of the Company, enforceable against the Company in accordance with their respective terms, except in each case: (i) as such enforceability may be limited by bankruptcy, insolvency, reorganization or similar laws affecting creditors’ rights generally; (ii) as enforceability of any indemnification or contribution provision may be limited under the federal and state securities laws; and (iii) that the remedy of specific performance and injunctive and other forms of equitable relief may be subject to the equitable defenses and to the discretion of the court before which any proceeding therefor may be brought.

2.13 No Conflicts, etc. The execution, delivery and performance by the Company of this Agreement and the Warrants and all ancillary documents, the consummation by the Company of the transactions herein and therein contemplated and the compliance by the Company with the terms hereof and thereof do not and will not, with or without the giving of notice or the lapse of time or both: (i) result in a breach of, or conflict with, in any material respect any of the terms and provisions of, or constitute a material default under, or result in the creation, modification, termination or imposition of any lien, charge or encumbrance upon any property or assets of the Company pursuant to the terms of any indenture, mortgage, deed of trust, loan agreement or any other agreement or instrument to which the Company is a party or as to which any property of the Company is a party; (ii) result in any violation of the provisions of the Company's Articles of Incorporation (as the same have been amended or restated from time to time, the "**Charter**") or the bylaws of the Company (the "**Bylaws**"); or (iii) violate any existing applicable law, rule, regulation, judgment, order or decree of any Governmental Entity as of the date hereof, except in the cases of clauses (i) and (iii) above, for any such violation or default that would not, individually or in the aggregate, have a Material Adverse Change.

2.14 No Defaults; Violations. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, no material default exists in the due performance and observance of any term, covenant or condition of any material license, contract, indenture, mortgage, deed of trust, note, loan or credit agreement, or any other agreement or instrument evidencing an obligation for borrowed money, or any other material agreement or instrument to which the Company is a party or by which the Company may be bound or to which any of the properties or assets of the Company is subject, except such defaults that would not, individually or in the aggregate, have a Material Adverse Change.. The Company is not (i) in violation of any term or provision of its Charter or Bylaws, or (ii) in violation of any franchise, license, permit, applicable law, rule, regulation, judgment or decree of any Governmental Entity, except for such violations that would not be reasonably expected to result in a Material Adverse Change.

2.15 Corporate Power; Licenses; Consents.

2.15.1. Conduct of Business. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company has all requisite corporate power and authority, and has all necessary consents, authorizations, approvals, licenses, certificates, clearances, permits and orders and supplements and amendments thereto (collectively, "**Authorizations**") of and from all Governmental Entities that it needs as of the date hereof to conduct its business purpose as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, except for such Authorizations, the absence of which would not reasonably be expected to have a Material Adverse Change.

2.15.2. Transactions Contemplated Herein. The Company has all corporate power and authority to enter into this Agreement and to carry out the provisions and conditions hereof and thereof, and all Authorizations required in connection therewith have been obtained. No Authorization of, and no filing with, any Governmental Entity, or another body is required for the valid issuance, sale and delivery of the Public Securities and the Representative Shares and the consummation of the transactions and agreements contemplated by this Agreement and as contemplated by the Registration Statement, the Pricing Disclosure Package and the Prospectus, except with respect to applicable federal and state securities or blue-sky laws and the rules and regulations of the Financial Industry Regulatory Authority, Inc. ("**FINRA**") and the Exchange.

2.16 D&O Questionnaires. To the Company's knowledge, all information contained in the questionnaires (the "**Questionnaires**") completed by each of the Company's directors and officers immediately prior to the Offering (the "**Insiders**") as supplemented by all information concerning the Company's directors and officers as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus provided to the Underwriters, is true and correct in all material respects and the Company has not become aware of any information which would cause the information disclosed in the Questionnaires to become materially inaccurate and incorrect.

2.17 Litigation; Governmental Proceedings. There is no action, suit, proceeding, inquiry, arbitration, investigation, litigation, regulatory or governmental proceeding pending or, to the Company's knowledge, threatened against, or involving the Company or, to the Company's knowledge, any executive officer or director which has not been disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, or in connection with the Company's listing application for the listing of the Public Securities on the Exchange, and is required to be disclosed therein.

2.18 Good Standing. The Company has been duly incorporated and is validly existing as a corporation and is in good standing under the laws of the State of Delaware as of the date hereof, and is duly qualified to do business and is in good standing as a foreign corporation in each other jurisdiction in which its ownership or lease of property or the conduct of business requires such qualification, except where the failure to be so qualified or in good standing, singularly or in the aggregate, would not have or reasonably be expected to result in a Material Adverse Change.

2.19 Insurance. The Company carries or is entitled to the benefits of insurance (including, without limitation, as to directors and officers insurance coverage), with reputable insurers, in such amounts and covering such risks which the Company believes are adequate,

and all such insurance is in full force and effect. The Company has no reason to believe that it will not be able (i) to renew its existing insurance coverage as and when such policies expire or (ii) to obtain comparable coverage from similar institutions as may be necessary or appropriate to conduct its business as now conducted and at a cost that would not reasonably be expected to result in a Material Adverse Change.

2.20 Transactions Affecting Disclosure to FINRA.

2.20.1. Finder's Fees. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, there are no claims, payments, arrangements, agreements or understandings relating to the payment of a finder's, consulting or origination fee by the Company or any Insider with respect to the sale of the Public Securities hereunder or any other arrangements, agreements or understandings of the Company or, to the Company's knowledge, any of its stockholders that may affect the Underwriters' compensation, as determined by FINRA.

2.20.2. Payments Within Twelve (12) Months. Except as disclosed in writing to the Representative or as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company has not made any direct or indirect payments in connection with the Offering (in cash, securities or otherwise) to: (i) any person, as a finder's fee, consulting fee or otherwise, in consideration of such person raising capital for the Company or introducing to the Company persons who raised or provided capital to the Company; (ii) any FINRA member; or (iii) any person or entity that has any direct or indirect affiliation or association with any FINRA member, within the twelve (12) months prior to the Effective Date, other than the payment to the Underwriters as provided hereunder in connection with the Offering.

2.20.3. Use of Proceeds. None of the net proceeds of the Offering will be paid by the Company to any participating FINRA member or its affiliates, except as specifically authorized herein.

2.20.4. FINRA Affiliation. There is no (i) officer or director of the Company, (ii) to the Company's knowledge, beneficial owner of 10% or more of any class of the Company's securities or (iii) to the Company's knowledge, beneficial owner of the Company's unregistered equity securities who acquired any equity securities of the Company during the 180-day period immediately preceding the filing of the Registration Statement that is an affiliate or associated person of a FINRA member participating in the Offering (as determined in accordance with the rules and regulations of FINRA).

2.20.5. Information. All information provided by the Company in its FINRA questionnaire to Representative Counsel specifically for use by Representative Counsel in connection with its Public Offering System filings (and related disclosure) with FINRA is true, correct and complete in all material respects.

2.21 Foreign Corrupt Practices Act. None of the Company and its Subsidiaries or, to the Company's knowledge, any director, officer, agent, employee or affiliate of the Company and its Subsidiaries or any other person acting on behalf of the Company and its Subsidiaries, has, directly or indirectly, given or agreed to give any money, gift or similar benefit (other than legal price concessions to customers in the ordinary course of business) to any customer, supplier, employee or agent of a customer or supplier, or official or employee of any Governmental Entity (domestic or foreign) or any political party or candidate for office (domestic or foreign) or other person who was, is, or may be in a position to help or hinder the business of the Company (or assist it in connection with any actual or proposed transaction) that (i) might subject the Company to any damage or penalty in any civil, criminal or governmental litigation or proceeding, (ii) if not given in the past, might have had a Material Adverse Change or (iii) if not continued in the future, might adversely affect the assets, business, operations or prospects of the Company. The Company has taken reasonable steps to ensure that its accounting controls and procedures are sufficient to cause the Company to comply in all material respects with the Foreign Corrupt Practices Act of 1977, as amended.

2.22 Compliance with OFAC. None of the Company and its Subsidiaries or, to the Company's knowledge, any director, officer, agent, employee or affiliate of the Company and its Subsidiaries or any other person acting on behalf of the Company and its Subsidiaries, is currently subject to any U.S. sanctions administered by the Office of Foreign Assets Control of the U.S. Department of the Treasury ("OFAC"), and the Company will not, directly or indirectly, use the proceeds of the Offering hereunder, or lend, contribute or otherwise make available such proceeds to any subsidiary, joint venture partner or other person or entity, for the purpose of financing the activities of any person currently subject to any U.S. sanctions administered by OFAC.

2.23 Money Laundering Laws. The operations of the Company and its Subsidiaries are and have been conducted at all times in compliance in all material respects 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 applicable jurisdictions, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any Governmental Entity (collectively, the “**Money Laundering Laws**”); and no action, suit or proceeding by or before any Governmental Entity involving the Company with respect to the Money Laundering Laws is pending or, to the best knowledge of the Company, threatened.

2.24 Officers’ Certificate. Any certificate signed by any duly authorized officer of the Company and delivered to you or to Representative Counsel on the Closing Date or the Option Closing Date shall be deemed a representation and warranty by the Company to the Underwriters as to the matters covered thereby.

2.25 Lock-Up Agreements. Schedule 3 hereto contains a complete and accurate list of the Company’s officers, directors, certain affiliates and holders of the Company’s outstanding shares of Common Stock (or securities convertible or exercisable into shares of Common Stock) who have agreed to executed a Lock-Up Agreement (collectively, the “**Lock-Up Parties**”). The Company has caused each of the Lock-Up Parties to deliver to the Representative an executed Lock-Up Agreement, in a form substantially similar to that attached hereto as Exhibit B (the “**Lock-Up Agreement**”), prior to the execution of this Agreement.

2.26 Subsidiaries. All direct and indirect Subsidiaries of the Company are duly organized and in good standing under the laws of the place of organization or incorporation, and each Subsidiary is in good standing in each jurisdiction in which its ownership or lease of property or the conduct of business requires such qualification, except where the failure to qualify would not have a Material Adverse Change. The Company’s ownership and control of each Subsidiary is as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

2.27 Related Party Transactions. There are no business relationships or related party transactions involving the Company or any other person required to be described in the Registration Statement, the Pricing Disclosure Package and the Prospectus that have not been described as required.

2.28 Board of Directors. The Board of Directors of the Company is comprised of the persons set forth under the heading of the Pricing Prospectus and the Prospectus captioned “Management.” The qualifications of the persons serving as board members and the overall composition of the board comply, in all material respects, with the Exchange Act, under the Exchange Act and the rules and regulations of the Commission promulgated thereunder (the “**Exchange Act Regulations**”), the Sarbanes-Oxley Act of 2002 and the rules promulgated thereunder (the “**Sarbanes-Oxley Act**”) applicable to the Company and the listing rules of the Exchange. At least one member of the Audit Committee of the Board of Directors of the Company qualifies as an “audit committee financial expert,” as such term is defined under Regulation S-K and the listing rules of the Exchange. In addition, at least a majority of the persons serving on the Board of Directors qualify as “independent,” as defined under the listing rules of the Exchange.

2.29 Sarbanes-Oxley Compliance.

2.29.1. Disclosure Controls. The Company has developed and currently maintains disclosure controls and procedures that will comply in all material respects with Rule 13a-15 or 15d-15 under the Exchange Act Regulations, and such controls and procedures are effective to ensure that all material information concerning the Company will be made known on a timely basis to the individuals responsible for the preparation of the Company’s Exchange Act filings and other public disclosure documents.

2.29.2. Compliance. The Company is and at the Applicable Time and on the Closing Date will be, in material compliance with the provisions of the Sarbanes-Oxley Act applicable to it, and has implemented or will implement such programs and has taken reasonable steps to ensure the Company’s future compliance (not later than the relevant statutory and regulatory deadlines therefor) with all of the material provisions of the Sarbanes-Oxley Act.

2.30 Accounting Controls. The Company and its Subsidiaries maintain systems of “internal control over financial reporting” (as defined under Rules 13a-15 and 15d-15 under the Exchange Act Regulations) that comply in all material respects with the requirements of the Exchange Act and have been designed by, or under the supervision of, their respective principal executive and principal financial officers, or persons performing similar functions, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP, including, but not limited to, internal accounting controls sufficient to provide reasonable assurance that (i) transactions are executed in accordance with management’s general or specific authorizations; (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with GAAP 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. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company is not aware of any material weaknesses in its internal controls. The Company's auditors and the Audit Committee of the Board of Directors of the Company have been advised of: (i) all significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are known to the Company's management and that have adversely affected or are reasonably likely to adversely affect the Company's ability to record, process, summarize and report financial information; and (ii) any fraud known to the Company's management, whether or not material, that involves management or other employees who have a significant role in the Company's internal controls over financial reporting.

2.31 No Investment Company Status. The Company is not and, after giving effect to the Offering and the application of the proceeds thereof as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, will not be, required to register as an "investment company," as defined in the Investment Company Act of 1940, as amended.

2.32 No Labor Disputes. No labor dispute with the employees of the Company or any of its Subsidiaries exists or, to the knowledge of the Company, is imminent. The Company is not aware that any key employee or significant group of employees of the Company plans to terminate employment with the Company.

2.33 Intellectual Property Rights. Except as disclosed in the Registration Statement, Pricing Disclosure Package and Prospectus, the Company and each of its Subsidiaries owns or possesses or has valid rights to use all patents, patent applications, trademarks, service marks, trade names, trademark registrations, service mark registrations, copyrights, licenses, inventions, trade secrets and similar rights ("**Intellectual Property Rights**") described in the Registration Statement, the Pricing Disclosure Package and the Prospectus and necessary for the conduct of the business of the Company and each of its Subsidiaries as currently carried on and as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus. To the knowledge of the Company, no action or use by the Company or any of its Subsidiaries necessary for the conduct of its business as currently carried on and as disclosed in the Registration Statement and the Prospectus will involve or give rise to any infringement of, or license or similar fees for, any Intellectual Property Rights of others. Neither the Company nor any of its Subsidiaries has received any notice alleging any such infringement, fee or conflict with asserted Intellectual Property Rights of others. Except as would not reasonably be expected to result, individually or in the aggregate, in a Material Adverse Change (A) to the knowledge of the Company, there is no infringement, misappropriation or violation by third parties of any of the Intellectual Property Rights owned by the Company; (B) there is no pending or, to the knowledge of the Company, threatened action, suit, proceeding or claim by others challenging the rights of the Company in or to any such Intellectual Property Rights, and the Company is unaware of any facts which would form a reasonable basis for any such claim, that would, individually or in the aggregate, together with any other claims in this Section 2.33, reasonably be expected to result in a Material Adverse Change; (C) the Intellectual Property Rights owned by the Company and, to the knowledge of the Company, the Intellectual Property Rights licensed to the Company have not been adjudged by a court of competent jurisdiction invalid or unenforceable, in whole or in part, and there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the validity or scope of any such Intellectual Property Rights, and the Company is unaware of any facts which would form a reasonable basis for any such claim that would, individually or in the aggregate, together with any other claims in this Section 2.33, reasonably be expected to result in a Material Adverse Change; (D) there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others that the Company infringes, misappropriates or otherwise violates any Intellectual Property Rights or other proprietary rights of others, the Company has not received any written notice of such claim and the Company is unaware of any other facts which would form a reasonable basis for any such claim that would, individually or in the aggregate, together with any other claims referred to in this Section 2.33, reasonably be expected to result in a Material Adverse Change; and (E) to the Company's knowledge, no employee of the Company is in or has ever been in violation in any material respect of any term of any employment contract, patent disclosure agreement, invention assignment agreement, non-competition agreement, non-solicitation agreement, nondisclosure agreement or any restrictive covenant to or with a former employer where the basis of such violation relates to such employee's employment with the Company, or actions undertaken by the employee while employed with the Company and could reasonably be expected to result, individually or in the aggregate, in a Material Adverse Change. To the Company's knowledge, all material technical information developed by and belonging to the Company which has not been patented has been kept confidential. The Company is not a party to or bound by any options, licenses or agreements with respect to the Intellectual Property Rights of any other person or entity that are required to be set forth in the Registration Statement, the Pricing Disclosure Package and the Prospectus and are not described therein. The Registration Statement, the Pricing Disclosure Package and the Prospectus contain in all material respects the same description of the matters set forth in the preceding sentence. None of the technology employed by the Company has been obtained or is knowingly being used by the Company in violation of any contractual obligation binding on the Company or, to the Company's knowledge, any of its officers, directors or employees, or otherwise in violation of the rights of any persons.

2.34 Taxes. Each of the Company and its Subsidiaries has filed all returns (as hereinafter defined) required to be filed with taxing authorities prior to the date hereof or has duly obtained extensions of time for the filing thereof. Each of the Company and its Subsidiaries has paid all taxes (as hereinafter defined) shown as due on such returns that were filed and has paid all taxes imposed on or assessed against the Company or such respective Subsidiary, except for any such failure that would not, individually or in the aggregate, have a Material Adverse Change. The provisions for taxes payable, if any, shown on the financial statements filed with or as part of the Registration Statement are sufficient for all accrued and unpaid taxes, whether or not disputed, and for all periods to and including the dates of such consolidated financial statements. Except as disclosed in writing to the Underwriters, (i) no issues have been raised (and are currently pending) by any taxing authority in connection with any of the returns or taxes asserted as due from the Company or its Subsidiaries, and (ii) no waivers of statutes of limitation with respect to the returns or collection of taxes have been given by or requested from the Company or its Subsidiaries. There are no tax liens against the assets, properties or business of the Company or its Subsidiaries. The term “**taxes**” means all federal, state, local, foreign and other net income, gross income, gross receipts, sales, use, ad valorem, transfer, franchise, profits, license, lease, service, service use, withholding, payroll, employment, excise, severance, stamp, occupation, premium, property, windfall profits, customs, duties or other taxes, fees, assessments or charges of any kind whatever, together with any interest and any penalties, additions to tax or additional amounts with respect thereto. The term “**returns**” means all returns, declarations, reports, statements and other documents required to be filed in respect to taxes.

2.35 ERISA Compliance. The Company and any “employee benefit plan” (as defined under the Employee Retirement Income Security Act of 1974, as amended, and the regulations and published interpretations thereunder (collectively, “**ERISA**”)) established or maintained by the Company or its “ERISA Affiliates” (as defined below) are in compliance in all material respects with ERISA. “**ERISA Affiliate**” means, with respect to the Company, any member of any group of organizations described in Sections 414(b), (c), (m) or (o) of the Internal Revenue Code of 1986, as amended, and the regulations and published interpretations thereunder (the “**Code**”) of which the Company is a member. No “reportable event” (as defined under ERISA) has occurred or is reasonably expected to occur with respect to any “employee benefit plan” established or maintained by the Company or any of its ERISA Affiliates. No “employee benefit plan” established or maintained by the Company or any of its ERISA Affiliates, if such “employee benefit plan” were terminated, would have any “amount of unfunded benefit liabilities” (as defined under ERISA). Neither the Company nor any of its ERISA Affiliates has incurred or reasonably expects to incur any material liability under (i) Title IV of ERISA with respect to termination of, or withdrawal from, any “employee benefit plan” or (ii) Sections 412, 4971, 4975 or 4980B of the Code. Each “employee benefit plan” established or maintained by the Company or any of its ERISA Affiliates that is intended to be qualified under Section 401(a) of the Code is so qualified and, to the knowledge of the Company, nothing has occurred, whether by action or failure to act, which would cause the loss of such qualification.

2.36 Compliance with Laws. Each of the Company and each Subsidiary: (A) is and at all times has been in compliance with all statutes, rules, or regulations applicable to the business of the Company as currently conducted (“**Applicable Laws**”), except as could not, individually or in the aggregate, reasonably be expected to have a Material Adverse Change; (B) has not received any warning letter, untitled letter or other correspondence or notice from any Governmental Entity alleging or asserting noncompliance with any Applicable Laws or any Authorizations; (C) possesses all material Authorizations and such Authorizations are valid and in full force and effect and are not in material violation of any term of any such Authorizations; (D) has not received notice of any claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from any Governmental Entity or third party alleging that any activity conducted by the Company is in violation of any Applicable Laws or Authorizations and has no knowledge that any such Governmental Entity or third party is considering any such claim, litigation, arbitration, action, suit, investigation or proceeding; (E) has not received notice that any Governmental Entity has taken, is taking or intends to take action to limit, suspend, modify or revoke any Authorizations and has no knowledge that any such Governmental Entity is considering such action; and (F) has filed, obtained, maintained or submitted all material reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by any Applicable Laws or Authorizations and that all such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were complete and correct in all material respects on the date filed (or were corrected or supplemented by a subsequent submission). All preclinical and clinical studies conducted by or on behalf of the Company to support clearance for commercialization of the Company’s products have been conducted by the Company, or to the Company’s knowledge by third parties, in compliance with all applicable federal, state or foreign laws, rules, orders and regulations, except for such failure or failures to be in compliance as would not reasonably be expected to have, singularly or in the aggregate, a Material Adverse Change.

2.37 Environmental Laws. The Company is in compliance with all foreign, federal, state and local rules, laws and regulations relating to the use, treatment, storage and disposal of hazardous or toxic substances or waste and protection of health and safety or the environment which are applicable to their businesses (“**Environmental Laws**”), except where the failure to comply would not, singularly or in the aggregate, result in a Material Adverse Change. There has been no storage, generation, transportation, handling, treatment,

disposal, discharge, emission, or other release of any kind of toxic or other wastes or other hazardous substances by, due to, or caused by the Company (or, to the Company's knowledge, any other entity for whose acts or omissions the Company is or may otherwise be liable) upon any of the property now or previously owned or leased by the Company, or upon any other property, in violation of any law, statute, ordinance, rule, regulation, order, judgment, decree or permit or which would, under any law, statute, ordinance, rule (including rule of common law), regulation, order, judgment, decree or permit, give rise to any liability, except for any violation or liability which would not have, singularly or in the aggregate with all such violations and liabilities, a Material Adverse Change; and there has been no disposal, discharge, emission or other release of any kind onto such property or into the environment surrounding such property of any toxic or other wastes or other hazardous substances with respect to which the Company has knowledge, except for any such disposal, discharge, emission, or other release of any kind which would not have, singularly or in the aggregate with all such discharges and other releases, a Material Adverse Change. In the ordinary course of business, the Company conducts periodic reviews of the effect of Environmental Laws on its business and assets, in the course of which they identify and evaluate 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 governmental permits issued thereunder, any related constraints on operating activities and any potential liabilities to third parties). On the basis of such reviews, the Company has reasonably concluded that such associated costs and liabilities would not have, singularly or in the aggregate, a Material Adverse Change.

2.38 Title to Property. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company and its Subsidiaries have good and marketable title in fee simple to, or have valid rights to lease or otherwise use, all items of real or personal property which are material to the business of the Company and its Subsidiaries taken as a whole, in each case free and clear of all liens, encumbrances, security interests, claims, except those matters that do not (i) materially interfere with the use made and proposed to be made of such property by the Company and any of its Subsidiaries or (ii) would not, individually or in the aggregate, have a Material Adverse Change; and all of the leases and subleases material to the business of the Company and its Subsidiaries, considered as one enterprise, and under which the Company or any of its Subsidiaries holds properties described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, are in full force and effect except those matters that do not (A) materially interfere with the use made and proposed to be made of such property by the Company and any of its Subsidiaries or (B) would not, individually or in the aggregate, have a Material Adverse Change, and neither the Company nor any Subsidiary has received any notice of any material claim of any sort that has been asserted by anyone adverse to the rights of the Company or any Subsidiary under any of the leases or subleases mentioned above, or affecting or questioning the rights of the Company or any Subsidiary to the continued possession of the leased or subleased premises under any such lease or sublease.

2.39 Contracts Affecting Capital. There are no transactions, arrangements or other relationships between and/or among the Company, any of its affiliates (as such term is defined in Rule 405 of the Securities Act Regulations) and any unconsolidated entity, including, but not limited to, any structured finance, special purpose or limited purpose entity that could reasonably be expected to materially affect the Company's or its Subsidiaries' liquidity or the availability of or requirements for their capital resources required to be described or incorporated by reference in the Registration Statement, the Pricing Disclosure Package and the Prospectus which have not been described or incorporated by reference as required.

2.40 Loans to Directors or Officers. There are no outstanding loans, advances (except normal advances for business expenses in the ordinary course of business) or guarantees or indebtedness by the Company or its Subsidiaries to or for the benefit of any of the officers or directors of the Company, its Subsidiaries, or any of their respective family members, except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

2.41 Ineligible Issuer. At the time of filing the Registration Statement and any post-effective amendment thereto, at the Effective Date and at the time of any amendment thereto, at the earliest time thereafter that the Company or another offering participant made a bona fide offer (within the meaning of Rule 164(h)(2) of the Securities Act Regulations) of the Public Securities and at the Effective Date, the Company was not and is not an "ineligible issuer," as defined in Rule 405, without taking account of any determination by the Commission pursuant to Rule 405 that it is not necessary that the Company be considered an ineligible issuer.

2.42 Smaller Reporting Company. As of the time of filing of the Registration Statement, the Company was a "smaller reporting company," as defined in Rule 12b-2 of the Exchange Act Regulations.

2.43 Industry Data. The statistical and market-related data included in each of the Registration Statement, the Pricing Disclosure Package and the Prospectus are based on or derived from sources that the Company reasonably and in good faith believes are reliable and accurate or represent the Company's good faith estimates that are made on the basis of data derived from such sources.

2.44 Clinical Studies. The animal and other preclinical studies and clinical trials conducted by the Company or on behalf of the Company that are described in the Registration Statement, Pricing Disclosure Package and Prospectus or the results of which are referred to in the Prospectus were, and if still pending are, to the Company's knowledge, being conducted in all material respects in compliance with all Applicable Laws and in accordance with medical and scientific research procedures that the Company reasonably believes are appropriate; descriptions of results of such preclinical studies and clinical trials contained in the Registration Statement and the Prospectus are accurate and fairly present the data derived from such preclinical studies and clinical trials, and the Company has no knowledge of any other clinical trials or preclinical studies, the results of which reasonably call into question the clinical trial or preclinical study results described or referred to in the Registration Statement and the Prospectus when viewed in the context in which such results are described; and the Company has not received any written notices or correspondence from the FDA, or any other domestic or foreign governmental agency requiring the termination, suspension or modification of any preclinical studies or clinical trials conducted by or on behalf of the Company that are described in the Registration Statement and the Prospectus or the results of which are referred to in the Registration Statement and the Prospectus.

2.45 Electronic Road Show. The Company has made available a Bona Fide Electronic Road Show in compliance with Rule 433(d)(8)(ii) of the Securities Act Regulations such that no filing of any "road show" (as defined in Rule 433(h) of the Securities Act Regulations) is required in connection with the Offering.

2.46 Margin Securities. The Company owns no "margin securities" as that term is defined in Regulation U of the Board of Governors of the Federal Reserve System (the "**Federal Reserve Board**"), and none of the proceeds of Offering will be used, directly or indirectly, for the purpose of purchasing or carrying any margin security, for the purpose of reducing or retiring any indebtedness which was originally incurred to purchase or carry any margin security or for any other purpose which might cause any of the shares of Common Stock to be considered a "purpose credit" within the meanings of Regulation T, U or X of the Federal Reserve Board.

2.47 Dividends and Distributions. Except as disclosed in the Registration Statement, Pricing Disclosure Package and the Prospectus, no Subsidiary of the Company is currently prohibited or restricted, 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.

2.48 Forward-Looking Statements. No forward-looking statement (within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act) contained in the Registration Statement, the Pricing Disclosure Package or the Prospectus has been made or reaffirmed without a reasonable basis or has been disclosed other than in good faith.

2.49 Exchange Act Reports. Except as disclosed in writing to the Representative, the Company has filed in a timely manner all reports required to be filed pursuant to Sections 13(a), 13(e), 14 and 15(d) of the Exchange Act during the preceding 12 months (except to the extent that Section 15(d) requires reports to be filed pursuant to Sections 13(d) and 13(g) of the Exchange Act, which shall be governed by the next clause of this sentence); and the Company has filed in a timely manner all reports required to be filed pursuant to Sections 13(d) and 13(g) of the Exchange Act, except where the failure to timely file could not reasonably be expected, individually or in the aggregate, to result in a Material Adverse Change.

2.50 Integration. Neither the Company nor any of its Subsidiaries, nor any person acting on its or their behalf has, directly or indirectly, made any offers or sales of any security or solicited any offers to buy any security, under circumstances that would cause the Offering to be integrated with prior offerings by the Company for purposes of the Securities Act that would require the registration of any such securities under the Securities Act.

2.51 Confidentiality and Non-Competitions. To the Company's knowledge, no director, officer, key employee or consultant of the Company or any Subsidiary is subject to any confidentiality, non-disclosure, non-competition agreement or non-solicitation agreement with any employer (other than the Company) or prior employer that could materially affect his or her ability to be and act in his or her respective capacity of the Company or such Subsidiary or be expected to result in a Material Adverse Change.

2.52 Corporate Records. The minute books of the Company have been made available to the Representative and Representative Counsel and such books (i) contain minutes of all material meetings and actions of the Board of Directors (including each board committee) and stockholders of the Company, and (ii) reflect all material transactions referred to in such minutes.

2.53 Diligence Materials. The Company has provided to the Representative and Representative Counsel all materials required or necessary to respond in all material respects to the diligence request submitted to the Company or Company Counsel by the Representative.

3. Covenants of the Company. The Company covenants and agrees as follows:

3.1 Amendments to Registration Statement. The Company shall deliver to the Representative, prior to filing, any amendment or supplement to the Registration Statement or Prospectus proposed to be filed after the Effective Date and not file any such amendment or supplement to which the Representative, based on the opinion of legal counsel, shall reasonably object in writing.

3.2 Federal Securities Laws.

3.2.1. Compliance. The Company, subject to Section 3.2.2, shall comply in all material respects with the requirements of Rule 430A of the Securities Act Regulations, and will notify the Representative promptly, and confirm the notice in writing, (i) when any post-effective amendment to the Registration Statement shall become effective or any amendment or supplement to the Prospectus shall have been filed; (ii) of its receipt of any comments from the Commission; (iii) of any request by the Commission for any amendment to the Registration Statement or any amendment or supplement to the Prospectus or for additional information; (iv) of the issuance by the Commission of any stop order suspending the effectiveness of the Registration Statement or any post-effective amendment or of any order preventing or suspending the use of any Preliminary Prospectus or the Prospectus, or of the suspension of the qualification of the Public Securities and Representative Shares for offering or sale in any jurisdiction, or of the initiation or threatening of any proceedings for any of such purposes or of any examination pursuant to Section 8(d) or 8(e) of the Securities Act concerning the Registration Statement and (v) if the Company becomes the subject of a proceeding under Section 8A of the Securities Act in connection with the Offering of the Public Securities and Representative Shares. The Company shall effect all filings required under Rule 424(b) of the Securities Act Regulations, in the manner and within the time period required by Rule 424(b) (without reliance on Rule 424(b)(8)), and shall take such steps as it deems necessary to ascertain promptly whether the form of prospectus transmitted for filing under Rule 424(b) was received for filing by the Commission and, in the event that it was not, it will promptly file such prospectus. The Company shall use its best efforts to prevent the issuance of any stop order, prevention or suspension and, if any such order is issued, to obtain the lifting thereof at the earliest possible moment.

15

3.2.2. Continued Compliance. The Company shall comply in all material respects with the Securities Act, the Securities Act Regulations, the Exchange Act and the Exchange Act Regulations so as to permit the completion of the distribution of the Public Securities as contemplated in this Agreement and in the Registration Statement, the Pricing Disclosure Package and the Prospectus. If at any time when a prospectus relating to the Public Securities is (or, but for the exception afforded by Rule 172 of the Securities Act Regulations (“**Rule 172**”), would be) required by the Securities Act to be delivered in connection with sales of the Public Securities, any event shall occur or condition shall exist as a result of which it is necessary, in the opinion of Representative Counsel or Company Counsel, to (i) amend the Registration Statement in order that the Registration Statement will not include an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading; (ii) amend or supplement the Pricing Disclosure Package or the Prospectus in order that the Pricing Disclosure Package or the Prospectus, as the case may be, 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 not misleading in the light of the circumstances existing at the time it is delivered to a purchaser or (iii) amend the Registration Statement or amend or supplement the Pricing Disclosure Package or the Prospectus, as the case may be, in order to comply with the requirements of the Securities Act or the Securities Act Regulations, the Company will promptly (A) give the Representative notice of such event; (B) prepare any amendment or supplement as may be necessary to correct such statement or omission or to make the Registration Statement, the Pricing Disclosure Package or the Prospectus comply with such requirements and, a reasonable amount of time prior to any proposed filing or use, furnish the Representative with copies of any such amendment or supplement and (C) file with the Commission any such amendment or supplement; provided that the Company shall not file or use any such amendment or supplement to which the Representative or Representative Counsel shall reasonably object. The Company will furnish to the Underwriters such number of copies of such amendment or supplement as the Underwriters may reasonably request. The Company has given the Representative notice of any filings made pursuant to the Exchange Act or the Exchange Act Regulations within two (2) Business Days prior to the Applicable Time. The Company shall give the Representative notice of its intention to make any such filing from the Applicable Time until the later of the Closing Date and the exercise in full or expiration of the Over-allotment Option specified in Section 1.2 hereof and will furnish the Representative with copies of the related document(s) a reasonable amount of time prior to such proposed filing, as the case may be, and will not file or use any such document to which the Representative or Representative Counsel shall reasonably object.

3.2.3. Exchange Act Registration. For a period of five (5) years after the date of this Agreement, the Company shall use its reasonable best efforts to maintain the registration of the shares of Common Stock and Warrants under the Exchange Act. The Company shall not deregister the Common Stock or Warrants under the Exchange Act without the prior written consent of the Representative.

3.2.4. Free Writing Prospectuses. The Company agrees that, unless it obtains the prior written consent of the Representative, it shall not make any offer relating to the Public Securities that would constitute an Issuer Free Writing Prospectus or that would otherwise constitute a “free writing prospectus,” or a portion thereof, required to be filed by the Company with the Commission or retained by the Company under Rule 433; provided that the Representative shall be deemed to have consented to each Issuer General Use Free Writing Prospectus set forth in Schedule 2-B. The Company represents that it has treated or agrees that it will treat each such free writing prospectus consented to, or deemed consented to, by the Representative as an “issuer free writing prospectus,” as defined in Rule 433, and that it has complied and will comply with the applicable requirements of Rule 433 with respect thereto, including timely filing with the Commission where required, legending and record keeping. If at any time following issuance of an Issuer Free Writing Prospectus there occurred or occurs an event or development as a result of which such Issuer Free Writing Prospectus conflicted or would conflict with the information contained in the Registration Statement or included or would include an untrue statement of a material fact or omitted or would omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances existing at that subsequent time, not misleading, the Company will promptly notify the Representative and will promptly amend or supplement, at its own expense, such Issuer Free Writing Prospectus to eliminate or correct such conflict, untrue statement or omission.

3.3 Delivery to the Underwriters of Registration Statements. The Company has delivered or made available or shall deliver or make available to the Representative and Representative Counsel, without charge, signed copies of the Registration Statement as originally filed and each amendment thereto (including exhibits filed therewith) and signed copies of all consents and certificates of experts, and will also deliver to each Underwriter, without charge, a conformed copy of the Registration Statement as originally filed and each amendment thereto (without exhibits) upon receipt of a written request therefor from such Underwriter. The copies of the Registration Statement and each amendment thereto furnished to the Underwriters will be identical to the electronically transmitted copies thereof filed with the Commission pursuant to EDGAR, except to the extent permitted by Regulation S-T.

3.4 Delivery to the Underwriters of Prospectuses. The Company has delivered or made available or will deliver or make available to each Underwriter, without charge, as many copies of each Preliminary Prospectus as such Underwriter reasonably requested, and the Company hereby consents to the use of such copies for purposes permitted by the Securities Act. The Company will furnish to each Underwriter, without charge, during the period when a prospectus relating to the Public Securities is (or, but for the exception afforded by Rule 172 of the Securities Act Regulations, would be) required to be delivered under the Securities Act, such number of copies of the Prospectus (as amended or supplemented) as such Underwriter may reasonably request. The Prospectus and any amendments or supplements thereto furnished to the Underwriters will be identical to the electronically transmitted copies thereof filed with the Commission pursuant to EDGAR, except to the extent permitted by Regulation S-T.

3.5 Effectiveness and Events Requiring Notice to the Representative. The Company shall use its best efforts to cause the Registration Statement to remain effective with a current prospectus for at least nine (9) months after the Applicable Time, and shall notify the Representative promptly and confirm the notice in writing: (i) of the effectiveness of the Registration Statement and any amendment thereto; (ii) of the issuance by the Commission of any stop order or of the initiation, or the threatening, of any proceeding for that purpose; (iii) of the issuance by any state securities commission of any proceedings for the suspension of the qualification of the Public Securities for offering or sale in any jurisdiction or of the initiation, or the threatening, of any proceeding for that purpose; (iv) of the mailing and delivery to the Commission for filing of any amendment or supplement to the Registration Statement or Prospectus; (v) of the receipt of any comments or request for any additional information from the Commission; and (vi) of the happening of any event during the period described in this Section 3.5 that, in the judgment of the Company, makes any statement of a material fact made in the Registration Statement, the Pricing Disclosure Package or the Prospectus untrue or that requires the making of any changes in (a) the Registration Statement in order to make the statements therein not misleading, or (b) in the Pricing Disclosure Package or the Prospectus in order to make the statements therein, in the light of the circumstances under which they were made, not misleading. If the Commission or any state securities commission shall enter a stop order or suspend such qualification at any time, the Company shall use its commercially reasonable efforts to obtain promptly the lifting of such order.

3.6 Listing. The Company shall use its best efforts to maintain the listing of the shares of Common Stock and Warrants on the Exchange for at least three (3) years from the date of this Agreement.

3.7 Reports to the Representative.

3.7.1. Periodic Reports, etc. For a period of three (3) years after the date of this Agreement, the Company shall furnish or make available to the Representative copies of such financial statements and other periodic and special reports as the Company from time to time furnishes generally to holders of any class of its securities and also promptly furnish to the Representative: (i) a copy of each periodic report the Company shall be required to file with the Commission under the Exchange Act and the Exchange Act Regulations; (ii) a copy of every press release and every news item and article with respect to the Company or its affairs which was released by the Company; (iii) a copy of each Form 8-K prepared and filed by the Company; (iv) a copy of each registration statement filed by the Company under the Securities Act; (v) a copy of each report or other communication furnished to stockholders and (vi) such additional documents and information with respect to the Company and the affairs of any future subsidiaries of the Company as the Representative may from time to time reasonably request. Documents filed with the Commission pursuant to its EDGAR system shall be deemed to have been delivered to the Representative pursuant to this Section 3.7.1.

3.7.2. Transfer Agent; Transfer Sheets. For a period of three (3) years after the date of this Agreement, the Company shall retain a transfer agent and registrar acceptable to the Representative (the “**Transfer Agent**”) and shall furnish to the Representative at the Company’s sole cost and expense such transfer sheets of the Company’s securities as the Representative may reasonably request, including the daily and monthly consolidated transfer sheets of the Transfer Agent and DTC. ClearTrust, LLC is acceptable to the Representative to act as Transfer Agent for the shares of Common Stock.

3.7.3. Trading Reports. For a period of three (3) years after the date of this Agreement, during such time as the Public Securities are listed on the Exchange, the Company shall provide to the Representative, at the Company’s expense, such reports published by the Exchange relating to price trading of the Public Securities, as the Representative shall reasonably request.

3.10 Payment of Expenses

3.10.1. General Expenses Related to the Offering. The Company hereby agrees to pay on each of the Closing Date and the Option Closing Date, if any, to the extent not paid at the Closing Date, all expenses incident to the performance of the obligations of the Company under this Agreement, including, but not limited to: (a) all filing fees and communication expenses relating to the registration of the Public Securities with the Commission; (b) all Public Offering System filing fees associated with the review of the Offering by FINRA; (c) all fees and expenses relating to the listing of such Public Securities on the Exchange and such other stock exchanges as the Company and the Representative together determine, including any fees charged by DTC; (d) all fees, expenses and disbursements relating to background checks of the Company’s officers and directors; (e) all fees, expenses and disbursements relating to the registration, qualification or exemption of the Public Securities under the securities laws of such states or foreign jurisdictions as the Representative may reasonably designate; (f) the costs of all mailing and printing of the underwriting documents (including, without limitation, the Underwriting Agreement, any Blue Sky Surveys and, if appropriate, any Agreement Among Underwriters, Selected Dealers’ Agreement, Underwriters’ Questionnaire and Power of Attorney), Registration Statements, Prospectuses and all amendments, supplements and exhibits thereto and as many preliminary and final Prospectuses as the Representative may reasonably deem necessary; (g) fees and expenses of the transfer agent for the shares of Common Stock; (h) fees and expenses of the warrant agent under the Warrant Agency Agreement; (i) stock transfer and/or stamp taxes, if any, payable upon the transfer of securities from the Company to the Underwriters; (j) the costs associated with commemorative mementos and lucite tombstones, each of which the Company or its designee shall provide within a reasonable time after the Closing Date in such quantities as the Representative may reasonably request; (k) the fees and expenses of the Company’s accountants; (l) the fees and expenses of the Company’s legal counsel and other agents and representatives; (m) the fees and expenses of Representative Counsel; (n) the cost associated with the Underwriters’ use of Ipreo’s book-building, prospectus tracking and compliance software for the Offering; and (o) the Underwriters’ actual accountable “road show” expenses for the Offering. Notwithstanding the foregoing, the Company’s obligations to reimburse the Representative for any out-of-pocket expenses actually incurred as set forth in the preceding sentence shall not exceed \$150,000.00 in the aggregate, including but not limited to the legal fees and road show expenses as described therein. The Representative may deduct from the net proceeds of the Offering payable to the Company on the Closing Date, or the Option Closing Date, if any, the expenses set forth herein to be paid by the Company to the Underwriters.

3.10.2. Expense Reimbursement Upon Termination. In the event the Offering is terminated, the Company agrees to reimburse the Underwriters pursuant to Section 8.3 hereof up to an aggregate of \$50,000.

3.11 Application of Net Proceeds. The Company shall apply the net proceeds from the Offering received by it in a manner consistent with the application thereof described under the caption “Use of Proceeds” in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

3.12 Delivery of Earnings Statements to Security Holders. The Company shall make generally available to its security holders as soon as practicable, but not later than the first day of the fifteenth (15th) full calendar month following the date of this Agreement, an earnings statement (which need not be certified by an independent registered public accounting firm unless required by the Securities Act or the Securities Act Regulations, but which shall satisfy the provisions of Rule 158(a) under Section 11(a) of the Securities Act) covering a period of at least twelve (12) consecutive months beginning after the date of this Agreement.

3.13 Stabilization. Neither the Company nor, to its knowledge, any of its employees, directors or stockholders has taken or shall take, directly or indirectly, any action designed to or that has constituted or that might reasonably be expected to cause or result in, under Regulation M of 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 Public Securities.

3.14 Internal Controls. The Company shall 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 authorization; (ii) transactions are recorded as necessary in order to permit preparation of financial statements in accordance with GAAP and to maintain accountability for assets; (iii) access to assets is permitted only in accordance with management's general or specific authorization; and (iv) the recorded accountability for assets is compared with existing assets at reasonable intervals and appropriate action is taken with respect to any differences.

3.15 Accountants. As of the date of this Agreement, the Company has retained an independent registered public accounting firm, as required by the Securities Act and the Securities Act Regulations and the Public Company Accounting Oversight Board.

3.16 FINRA. For a period of 60 days from the later of the Closing Date or the Option Closing Date, the Company shall advise the Representative (who shall make an appropriate filing with FINRA) if it is or becomes aware that (i) any officer or director of the Company, (ii) any beneficial owner of 10% or more of any class of the Company's securities or (iii) any beneficial owner of the Company's unregistered equity securities which were acquired during the 180 days immediately preceding the filing of the Registration Statement is or becomes an affiliate or associated person of a FINRA member participating in the Offering (as determined in accordance with the rules and regulations of FINRA).

3.17 No Fiduciary Duties. The Company acknowledges and agrees that the Underwriters' responsibility to the Company is solely contractual in nature and that none of the Underwriters or their affiliates or any selling agent shall be deemed to be acting in a fiduciary capacity, or otherwise owes any fiduciary duty to the Company or any of its affiliates in connection with the Offering and the other transactions contemplated by this Agreement.

3.18 Company Lock-Up Agreements.

3.18.1. Restriction on Sales of Capital Stock. The Company, on behalf of itself and any successor entity, agrees that, without the prior written consent of the Representative, it will not, for a period of 180 days after the date of this Agreement (the "**Lock-Up Period**"), (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend, or otherwise transfer or dispose of, directly or indirectly, any shares of capital stock of the Company or any securities convertible into or exercisable or exchangeable for shares of capital stock of the Company; provided, however, that this clause (i) shall not apply to the issuance of any shares of capital stock, options or warrants in connection with any acquisition of a business that the Company currently has agreed to purchase or with which the Company is currently in discussions to purchase; (ii) file or cause to be filed any registration statement with the Commission relating to the offering of any shares of capital stock of the Company or any securities convertible into or exercisable or exchangeable for shares of capital stock of the Company; or (iii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of capital stock of the Company, whether any such transaction described in clause (i), (ii), or (iii) above is to be settled by delivery of shares of capital stock of the Company or such other securities, in cash or otherwise.

The restrictions contained in this Section 3.18.1 shall not apply to (i) the shares of Common Stock to be sold hereunder, (ii) the issuance by the Company of shares of Common Stock upon the exercise of an outstanding stock option or warrant or the conversion of a security outstanding on the date hereof, of which the Representative has been advised in writing, (iii) the issuance by the Company of any security under any equity compensation plan of the Company, (iv) any issuance of securities pursuant to any resale registration statement for existing shareholders, (v) any sales made pursuant to an "at the market offering" as defined under Rule 415 of the Securities Act or (vi) any issuance of securities disclosed in the Registration Statement, the Pricing Disclosure Package or the

Prospectus; provided that, prior to the issuance of any such stock options or shares of capital stock of the Company that are vested or vest during the Lock-Up Period, each recipient thereof shall sign and deliver a Lock-Up Agreement.

3.19 Blue Sky Qualifications. The Company shall use its commercially reasonable efforts, in cooperation with the Underwriters, if necessary, to qualify the Public Securities for offering and sale under the applicable securities laws of such states and other jurisdictions (domestic or foreign) as the Representative may designate and to maintain such qualifications in effect so long as required to complete the distribution of the Public Securities; provided, however, that the Company shall not be obligated to file any general consent to service of process or to qualify as a foreign corporation or as a dealer in securities in any jurisdiction in which it is not so qualified or to subject itself to taxation in respect of doing business in any jurisdiction in which it is not otherwise so subject.

3.20 Reporting Requirements. The Company, during the period when a prospectus relating to the Public Securities is (or, but for the exception afforded by Rule 172, would be) required to be delivered under the Securities Act, will file all documents required to be filed with the Commission pursuant to the Exchange Act within the time periods required by the Exchange Act and Exchange Act Regulations. Additionally, the Company shall report the use of proceeds from the issuance of the Public Securities as may be required under Rule 463 under the Securities Act Regulations.

3.21 Press Releases. Prior to the Closing Date and any Option Closing Date, the Company shall not issue any press release or other communication directly or indirectly or hold any press conference with respect to the Company, its condition, financial or otherwise, or earnings, business affairs or business prospects (except for routine oral marketing communications in the ordinary course of business and consistent with the past practices of the Company and of which the Representative is notified), without the prior written consent of the Representative, which consent shall not be unreasonably withheld, unless in the judgment of the Company and its counsel, and after notification to the Representative, such press release or communication is required by law.

3.22 Sarbanes-Oxley. The Company shall at all times comply in all material respects with all applicable provisions of the Sarbanes-Oxley Act in effect from time to time.

3.23 IRS Forms. If requested by the Representative, the Company shall deliver to each Underwriter (or its agent), prior to or at the Closing Date, a properly completed and executed Internal Revenue Service (“IRS”) Form W-9 or an IRS Form W-8, as appropriate, together with all required attachments to such form.

3.24 Warrant Agent. For so long as the Warrants are outstanding, the Company will maintain the Warrant Agency Agreement in full force and effect with [] or a transfer agent of similar competence and quality. The Firm Warrants, and if applicable, Option Warrants, will be issued in accordance with the Warrant Agency Agreement.

4. Conditions of Underwriters’ Obligations. The obligations of the Underwriters to purchase and pay for the Public Securities, as provided herein, shall be subject to (i) the continuing accuracy of the representations and warranties of the Company as of the date hereof and as of each of the Closing Date and the Option Closing Date, if any; (ii) the accuracy of the statements of officers of the Company made pursuant to the provisions hereof; (iii) the performance by the Company of its obligations hereunder; and (iv) the following conditions:

4.1 Regulatory Matters.

4.1.1. Effectiveness of Registration Statement; Rule 430A Information. The Registration Statement has become effective not later than 5:30 p.m., Eastern time, on the date of this Agreement or such later date and time as shall be consented to in writing by the Representative, and, at each of the Closing Date and any Option Closing Date, no stop order suspending the effectiveness of the Registration Statement or any post-effective amendment thereto shall have been issued under the Securities Act, no order preventing or suspending the use of any Preliminary Prospectus or the Prospectus shall have been issued and no proceedings for any of those purposes shall have been instituted or are pending or, to the Company’s knowledge, contemplated by the Commission. The Company has complied with each request (if any) from the Commission for additional information. A prospectus containing the Rule 430A Information shall have been filed with the Commission in the manner and within the time frame required by Rule 424(b) under the Securities Act Regulations (without reliance on Rule 424(b)(8)) or a post-effective amendment providing such information shall have been filed with, and declared effective by, the Commission in accordance with the requirements of Rule 430A under the Securities Act Regulations.

4.1.2. FINRA Clearance. On or before the date of this Agreement, the Representative shall have received clearance from FINRA as to the amount of compensation allowable or payable to the Underwriters as disclosed in the Registration Statement.

4.1.3. Exchange Clearance. On the Closing Date and Option Closing Date (if any), the Company's shares of Common Stock and Warrants shall have been approved for listing on the Exchange, subject only to official notice of issuance.

4.2 Company Counsel Matters.

4.2.1. Closing Date Opinion of Counsel. On the Closing Date, the Representative shall have received the favorable opinion and written statement providing certain "10b-5" negative assurances of Duane Morris LLP ("**Company Counsel**"), counsel to the Company, dated the Closing Date and addressed to the Representative, in form and substance reasonably satisfactory to the Representative.

4.2.2. Option Closing Date Opinions of Counsel. On the Option Closing Date, if any, the Representative shall have received the favorable opinions of counsel listed in Section 4.2.1, dated the Option Closing Date, addressed to the Representative and in form and substance reasonably satisfactory to the Representative, confirming as of the Option Closing Date, the statements made by such counsels in their respective opinions delivered on the Closing Date.

4.3 Comfort Letters.

4.3.1. Cold Comfort Letter. At the time this Agreement is executed the Representative shall have received a cold comfort letter from the Auditor containing statements and information of the type customarily included in accountants' comfort letters with respect to the financial statements and certain financial information contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus, addressed to the Representative and in form and substance satisfactory in all respects to the Representative and to Representative Counsel from the Auditor, dated as of the date of this Agreement.

4.3.2. Bring-down Comfort Letter. At each of the Closing Date and the Option Closing Date, if any, the Representative shall have received from the Auditor a letter, dated as of the Closing Date or the Option Closing Date, as applicable, to the effect that the Auditor reaffirms the statements made in the letter furnished pursuant to Section 4.3.1, except that the specified date referred to shall be a date not more than three (3) Business Days prior to the Closing Date or the Option Closing Date, as applicable.

4.4 Officers' Certificates.

4.4.1. Officers' Certificate. The Company shall have furnished to the Representative a certificate, dated the Closing Date and any Option Closing Date (if such date is other than the Closing Date), of its Chief Executive Officer or President, and its Chief Financial Officer stating on behalf of the Company and not in an individual capacity that (i) such officers have carefully examined the Registration Statement, the Pricing Disclosure Package, any Issuer Free Writing Prospectus and the Prospectus and, in their opinion, the Registration Statement and each amendment thereto after the Effective Date, as of the Applicable Time and as of the Closing Date (or any Option Closing Date if such date is other than the Closing Date) did not include any untrue statement of a material fact and did not omit to state a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading, and the Pricing Disclosure Package, as of the Applicable Time and as of the Closing Date (or any Option Closing Date if such date is other than the Closing Date), any Issuer Free Writing Prospectus as of its date and as of the Closing Date (or any Option Closing Date if such date is other than the Closing Date), the Prospectus and each amendment or supplement thereto after the Effective Date, as of the respective date thereof and as of the Closing Date, did not include any untrue statement of a material fact and did not 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, (ii) since the effective date of the Registration Statement, no event has occurred which should have been set forth in a supplement or amendment to the Registration Statement, the Pricing Disclosure Package or the Prospectus, (iii) to the best of their knowledge after reasonable investigation, as of the Closing Date (or any Option Closing Date if such date is other than the Closing Date), the representations and warranties of the Company in this Agreement are true and correct in all material respects and the Company has materially complied with all agreements and satisfied all conditions on its part to be performed or satisfied hereunder at or prior to the Closing Date (or any Option Closing Date if such date is other than the Closing Date), and (iv) there has not been, subsequent to the date of the most recent audited financial statements included in the Pricing Disclosure Package, a Material Adverse Change.

4.4.2. Secretary's Certificate. At each of the Closing Date and the Option Closing Date, if any, the Representative shall have received a certificate of the Company signed by the Secretary of the Company, dated the Closing Date or the Option Closing Date,

as the case may be, respectively, certifying on behalf of the Company and not in an individual capacity: (i) that each of the Charter and Bylaws is true and complete, has not been modified and is in full force and effect; (ii) that the resolutions of the Company's Board of Directors relating to the Offering are in full force and effect and have not been modified; and (iii) as to the incumbency of the officers of the Company. The documents referred to in such certificate shall be attached to such certificate.

4.5 No Material Changes. Prior to and on each of the Closing Date and each Option Closing Date, if any: (i) there shall have been no Material Adverse Change in the condition or prospects or the business activities, financial or otherwise, of the Company from the latest dates as of which such condition is set forth in the Registration Statement, the Pricing Disclosure Package and the Prospectus; (ii) no action, suit or proceeding, at law or in equity, shall have been pending or threatened against the Company or any Insider before or by any court or federal or state commission, board or other administrative agency wherein an unfavorable decision, ruling or finding may reasonably be expected to cause a Material Adverse Change, except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus; (iii) no stop order shall have been issued under the Securities Act and no proceedings therefor shall have been initiated or threatened by the Commission; and (iv) the Registration Statement, the Pricing Disclosure Package and the Prospectus and any amendments or supplements thereto shall contain all material statements which are required to be stated therein in accordance with the Securities Act and the Securities Act Regulations and shall conform in all material respects to the requirements of the Securities Act and the Securities Act Regulations, and neither the Registration Statement, the Pricing Disclosure Package nor the Prospectus nor any amendment or supplement thereto shall contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading.

4.6 No Material Misstatement or Omission. The Underwriters shall not have discovered and disclosed to the Company on or prior to the Closing Date and any Option Closing Date that the Registration Statement or any amendment or supplement thereto contains an untrue statement of a material fact which, in the opinion of Representative Counsel, is material or omits to state any fact which, in the opinion of such counsel, is material and is required to be stated therein or is necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading, or that the Registration Statement, the Pricing Disclosure Package, any Issuer Free Writing Prospectus or the Prospectus or any amendment or supplement thereto contains an untrue statement of fact which, in the opinion of Representative Counsel, is material or omits to state any fact which, in the opinion of Representative Counsel, is material and is necessary in order to make the statements, in the light of the circumstances under which they were made, not misleading.

4.7 Corporate Proceedings. All corporate proceedings and other legal matters incident to the authorization, form and validity of each of this Agreement, the Public Securities, the Registration Statement, the Pricing Disclosure Package, each Issuer Free Writing Prospectus, if any, and the Prospectus and all other legal matters relating to this Agreement and the transactions contemplated hereby and thereby shall be reasonably satisfactory in all material respects to Representative Counsel, and the Company shall have furnished to such counsel all documents and information that they may reasonably request to enable them to pass upon such matters.

4.8 Delivery of Agreements.

4.8.1. Lock-Up Agreements. On or before the date of this Agreement, the Company shall have delivered to the Representative executed copies of the Lock-Up Agreements from each of the persons listed in Schedule 3 hereto.

4.9 Warrant Agency Agreement. On or before the date of this Agreement, the Company shall have entered into a Warrant Agency Agreement between the Company and [____], as warrant agent with respect to the Warrants, in the form filed as an exhibit to the Registration Statement (the "**Warrant Agency Agreement**"), or if applicable, as otherwise directed by the Underwriters.

4.10 Additional Documents. At the Closing Date and at each Option Closing Date (if any) Representative Counsel shall have been furnished with such documents and opinions as they may reasonably require for the purpose of enabling Representative Counsel to deliver an opinion to the Underwriters, or in order to evidence the accuracy of any of the representations or warranties, or the fulfillment of any of the conditions, herein contained; and all proceedings taken by the Company in connection with the issuance and sale of the Public Securities and the Representative Shares as herein contemplated shall be satisfactory in form and substance to the Representative and Representative Counsel.

5. Indemnification.

5.1 Indemnification of the Underwriters.

5.1.1. General. The Company shall indemnify and hold harmless each Underwriter, its affiliates and each of its and their respective directors, officers, members, employees, representatives, partners, shareholders, affiliates, agents and each person, if any, who controls any such Underwriter within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act (collectively the “**Underwriter Indemnified Parties**,” and each an “**Underwriter Indemnified Party**”), against any and all loss, liability, claim, damage and expense whatsoever (including but not limited to any and all legal or other expenses reasonably incurred in investigating, preparing or defending against any litigation, commenced or threatened, or any claim whatsoever, whether arising out of any action between any of the Underwriter Indemnified Parties and the Company or between any of the Underwriter Indemnified Parties and any third party, or otherwise) to which they or any of them may become subject under the Securities Act, the Exchange Act or any other statute or at common law or otherwise, arising out of or based upon any untrue statement or alleged untrue statement of a material fact contained in (i) the Registration Statement, the Pricing Disclosure Package, the Preliminary Prospectus, the Prospectus or any Issuer Free Writing Prospectus (as from time to time each may be amended and supplemented); (ii) any materials or information provided to investors by, or with the approval of, the Company in connection with the marketing of the Offering, including any “road show” or investor presentations made to investors by the Company (whether in person or electronically); or (iii) any application or other document or written communication (in this Section 5, collectively called “**application**”) executed by the Company or based upon written information furnished by the Company in any jurisdiction in order to qualify the Public Securities and Representative Shares under the securities laws thereof or filed with the Commission, any state securities commission or agency, the Exchange or any other national securities exchange; or the omission or alleged omission therefrom of a material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading, unless such statement or omission was made in reliance upon, and in conformity with, the Underwriters’ Information. With respect to any untrue statement or omission or alleged untrue statement or omission made in the Pricing Disclosure Package, the indemnity agreement contained in this Section 5.1.1 shall not inure to the benefit of any Underwriter Indemnified Party to the extent that any loss, liability, claim, damage or expense of such Underwriter Indemnified Party results from the fact that a copy of the Prospectus was not given or sent to the person asserting any such loss, liability, claim or damage at or prior to the written confirmation of sale of the Public Securities to such person as required by the Securities Act and the Securities Act Regulations, and if the untrue statement or omission has been corrected in the Prospectus, unless such failure to deliver the Prospectus was a result of non-compliance by the Company with its obligations under Section 3.3 hereof.

5.1.2. Procedure. If any action is brought against an Underwriter Indemnified Party in respect of which indemnity may be sought against the Company pursuant to Section 5.1.1, such Underwriter Indemnified Party shall promptly notify the Company in writing of the institution of such action and the Company shall be entitled to participate therein and, to the extent that it wishes, jointly with any other similarly notified indemnifying party, to assume the defense of such action, including the employment and fees of counsel (subject to the reasonable approval of such Underwriter Indemnified Party) and payment of actual expenses. Such Underwriter Indemnified Party shall have the right to employ its or their own counsel in any such case, but the fees and expenses of such counsel shall be at the expense of such Underwriter Indemnified Party unless (i) the employment of such counsel at the expense of the Company shall have been authorized in writing by the Company in connection with the defense of such action, or (ii) the Company shall not have employed counsel to have charge of the defense of such action, or (iii) such indemnified party or parties shall have been advised by its counsel that there may be defenses available to it or them which are different from or additional to those available to the Company (in which case the Company shall not have the right to direct the defense of such action on behalf of the indemnified party or parties), in any of which events the reasonable fees and expenses of not more than one additional firm of attorneys selected by the Underwriter Indemnified Parties who are party to such action (in addition to local counsel) shall be borne by the Company. Notwithstanding anything to the contrary contained herein, if any Underwriter Indemnified Party shall assume the defense of such action as provided above, the Company shall have the right to approve the terms of any settlement of such action, which approval shall not be unreasonably withheld.

5.2 Indemnification of the Company. Each Underwriter, severally and not jointly, shall indemnify and hold harmless the Company, its directors, its officers who signed the Registration Statement and persons who control the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act against any and all loss, liability, claim, damage and expense described in the foregoing indemnity from the Company to the several Underwriters, as incurred, but only with respect to such losses, liabilities, claims, damages and expenses (or actions in respect thereof) which arise out of or are based upon untrue statements or omissions made in the Registration Statement, any Preliminary Prospectus, the Pricing Disclosure Package or Prospectus or any amendment or supplement thereto or in any application, in reliance upon, and in strict conformity with, the Underwriters’ Information. In case any action shall be brought against the Company or any other person so indemnified based on any Preliminary Prospectus, the Registration Statement, the Pricing Disclosure Package or Prospectus or any amendment or supplement thereto or any application, and in respect of which indemnity may be sought against any Underwriter, such Underwriter shall have the rights and duties given to the Company, and the Company and each other person so indemnified shall have the rights and duties given to the several Underwriters by the provisions of Section 5.1.2. The Company agrees promptly to notify the Representative of the commencement of any litigation or proceedings against the Company or any of its officers, directors or any person, if any, who controls the Company within the meaning of Section 15 of the Securities Act or

5.3 Contribution.

5.3.1. Contribution Rights. If the indemnification provided for in this Section 5 shall for any reason be unavailable to or insufficient to hold harmless an indemnified party under Section 5.1 or 5.2 in respect of any loss, claim, damage or liability, or any action in respect thereof, referred to therein, then each indemnifying party shall, in lieu of indemnifying such indemnified party, contribute to the amount paid or payable by such indemnified party as a result of such loss, claim, damage or liability, or action in respect thereof, (i) in such proportion as shall be appropriate to reflect the relative benefits received by the Company, on the one hand, and each of the Underwriters, on the other hand, from the Offering, or (ii) if the allocation provided by clause (i) above is not permitted by applicable law, in such proportion as is appropriate to reflect not only the relative benefits referred to in clause (i) above but also the relative fault of the Company, on the one hand, and the Underwriters, on the other, with respect to the statements or omissions that resulted in such loss, claim, damage or liability, or action in respect thereof, as well as any other relevant equitable considerations. The relative benefits received by the Company, on the one hand, and the Underwriters, on the other, with respect to such Offering shall be deemed to be in the same proportion as the total proceeds from the Offering purchased under this Agreement (before deducting expenses) received by the Company bear to the total underwriting discount and commissions received by the Underwriters in connection with the Offering, in each case as set forth in the table on the cover page of the Prospectus. The relative fault of the Company, on the one hand, and the Underwriters, on the other, shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the Company, on the one hand, or the Underwriters, on the other, the intent of the parties and their relative knowledge, access to information and opportunity to correct or prevent such untrue statement, omission, act or failure to act; provided that the parties hereto agree that the written information furnished to the Company through the Representative by or on behalf of any Underwriter for use in any Preliminary Prospectus, any Registration Statement or the Prospectus, or in any amendment or supplement thereto, consists solely of the Underwriters' Information. The Company and the Underwriters agree that it would not be just and equitable if contributions pursuant to this Section 5.3.1 were to be determined by pro rata allocation or by any other method of allocation that does not take into account the equitable considerations referred to herein. The amount paid or payable by an indemnified party as a result of the loss, claim, damage, expense, liability, action, investigation or proceeding referred to above in this Section 5.3.1 shall be deemed to include, for purposes of this Section 5.3.1, any legal or other expenses reasonably incurred by such indemnified party in connection with investigating, preparing to defend or defending against or appearing as a third party witness in respect of, or otherwise incurred in connection with, any such loss, claim, damage, expense, liability, action, investigation or proceeding. Notwithstanding the provisions of this Section 5.3.1 no Underwriter shall be required to contribute any amount in excess of the total discount and commission received by such Underwriter in connection with the Offering less the amount of any damages which such Underwriter has otherwise paid or becomes liable to pay by reason of any untrue or alleged untrue statement, omission or alleged omission, act or alleged act or failure to act or alleged failure to act. 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.

5.3.2. Contribution Procedure. Within fifteen (15) days after receipt by any party to this Agreement (or its representative) of notice of the commencement of any action, suit or proceeding, such party will, if a claim for contribution in respect thereof is to be made against another party ("contributing party"), notify the contributing party of the commencement thereof, but the failure to so notify the contributing party will not relieve it from any liability which it may have to any other party other than for contribution hereunder. In case any such action, suit or proceeding is brought against any party, and such party notifies a contributing party or its representative of the commencement thereof within the aforesaid 15 days, the contributing party will be entitled to participate therein with the notifying party and any other contributing party similarly notified. Any such contributing party shall not be liable to any party seeking contribution on account of any settlement of any claim, action or proceeding affected by such party seeking contribution without the written consent of such contributing party. The contribution provisions contained in this Section 5.3.2 are intended to supersede, to the extent permitted by law, any right to contribution under the Securities Act, the Exchange Act or otherwise available. The Underwriters' obligations to contribute as provided in this Section 5.3 are several and in proportion to their respective underwriting obligation, and not joint.

6. Default by an Underwriter.

6.1 Default Not Exceeding 10% of Firm Securities or Option Securities. If any Underwriter or Underwriters shall default in its or their obligations to purchase the Firm Securities or the Option Securities, if the Over-allotment Option is exercised hereunder, and if the number of the Firm Securities or Option Securities with respect to which such default relates does not exceed in the aggregate 10% of the number of Firm Shares and accompanying Firm Warrants or Option Shares and accompanying Option Warrants that all Underwriters have agreed to purchase hereunder, then such Firm Securities or Option Securities to which the default relates shall be purchased by the non-defaulting Underwriters in proportion to their respective commitments hereunder.

6.2 Default Exceeding 10% of Firm Securities or Option Securities. In the event that the default addressed in Section 6.1 relates to more than 10% of the number of Firm Shares and accompanying Firm Warrants or Option Shares and accompanying Option Warrants, the Representative may in its discretion arrange for itself or for another party or parties to purchase such Firm Securities or Option Securities to which such default relates on the terms contained herein. If, within one (1) Business Day after such default relating to more than 10% of the number of Firm Shares and accompanying Firm Warrants or Option Shares and accompanying Option Warrants, the Representative does not arrange for the purchase of such Firm Securities or Option Securities, then the Company shall be entitled to a further period of one (1) Business Day within which to procure another party or parties satisfactory to the Representative to purchase said Firm Securities or Option Securities on such terms. In the event that neither the Representative nor the Company arrange for the purchase of the Firm Securities or Option Securities to which a default relates as provided in this Section 6, this Agreement will automatically be terminated by the Representative or the Company without liability on the part of the Company (except as provided in Sections 3.10 and 5 hereof) or the several Underwriters (except as provided in Section 5 hereof); provided, however, that if such default occurs with respect to the Option Securities, this Agreement will not terminate as to the Firm Securities; and provided, further, that nothing herein shall relieve a defaulting Underwriter of its liability, if any, to the other Underwriters and to the Company for damages occasioned by its default hereunder.

6.3 Postponement of Closing Date. In the event that the Firm Securities or Option Securities to which the default relates are to be purchased by the non-defaulting Underwriters, or are to be purchased by another party or parties as aforesaid, you or the Company shall have the right to postpone the Closing Date or Option Closing Date for a reasonable period, but not in any event exceeding five (5) Business Days, in order to effect whatever changes may thereby be made necessary in the Registration Statement, the Pricing Disclosure Package or the Prospectus or in any other documents and arrangements, and the Company agrees to file promptly any amendment to the Registration Statement, the Pricing Disclosure Package or the Prospectus that in the opinion of Representative Counsel may thereby be made necessary. The term “**Underwriter**” as used in this Agreement shall include any party substituted under this Section 6 with like effect as if it had originally been a party to this Agreement with respect to such Firm Securities or Option Securities.

7. Additional Covenants.

7.1 Board Composition and Board Designations. The Company shall ensure that: (i) the qualifications of the persons serving as members of the Board of Directors and the overall composition of the Board of Directors comply with the Sarbanes-Oxley Act, the Exchange Act and the listing rules of the Exchange or any other national securities exchange, as the case may be, in the event the Company seeks to have its Public Securities listed on another exchange or quoted on an automated quotation system, and (ii) if applicable, at least one member of the Audit Committee of the Board of Directors qualifies as an “audit committee financial expert,” as such term is defined under Regulation S-K and the listing rules of the Exchange.

7.2 Prohibition on Press Releases and Public Announcements. The Company shall not issue press releases or engage in any other publicity, without the Representative’s prior written consent, for a period ending at 5:00 p.m., Eastern time, on the first (1st) Business Day following the fortieth (40th) day after the Closing Date, other than normal and customary releases issued in the ordinary course of the Company’s business.

8. Effective Date of this Agreement and Termination Thereof.

8.1 Effective Date. This Agreement shall become effective when both the Company and the Representative have executed the same and delivered counterparts of such signatures to the other party.

8.2 Termination. The Representative shall have the right to terminate this Agreement at any time prior to any Closing Date, (i) if any domestic or international event or act or occurrence has materially disrupted, or in the Representative’s opinion will in the immediate future materially disrupt, general securities markets in the United States; or (ii) if trading on the New York Stock Exchange or the Nasdaq Stock Market LLC shall have been suspended or materially limited, or minimum or maximum prices for trading shall have been fixed, or maximum ranges for prices for securities shall have been required by FINRA or by order of the Commission or any other government

authority having jurisdiction; or (iii) if the United States shall have become involved in a new war or an increase in major hostilities; or (iv) if a banking moratorium has been declared by a New York State or federal authority; or (v) if a moratorium on foreign exchange trading has been declared which materially adversely impacts the United States securities markets; or (vi) if the Company shall have sustained a material loss by fire, flood, accident, hurricane, earthquake, theft, sabotage or other calamity or malicious act which, whether or not such loss shall have been insured, will, in your opinion, make it inadvisable to proceed with the delivery of the Firm Securities or Option Securities; or (vii) if the Company is in material breach of any of its representations, warranties or covenants hereunder; or (viii) if the Representative shall have become aware after the date hereof of a Material Adverse Change, or an adverse material change in general market conditions as in the Representative's judgment would make it impracticable to proceed with the offering, sale and/or delivery of the Public Securities or to enforce contracts made by the Underwriters for the sale of the Public Securities.

8.3 Expenses. Notwithstanding anything to the contrary in this Agreement, except in the case of a default by the Underwriters, pursuant to Section 6.2 above, in the event that this Agreement shall not be carried out for any reason whatsoever, within the time specified herein or any extensions thereof pursuant to the terms herein, the Company shall be obligated to pay to the Underwriters their actual and accountable out-of-pocket expenses related to the transactions contemplated herein then due and payable (including the reasonable fees and disbursements of Representative Counsel not to exceed \$50,000) up to \$50,000, and upon demand the Company shall pay the full amount thereof to the Representative on behalf of the Underwriters; provided, however, that such expense cap in no way limits or impairs the indemnification and contribution provisions of this Agreement.

Notwithstanding the foregoing, any advance received by the Representative will be reimbursed to the Company to the extent not actually incurred in compliance with FINRA Rule 5110(g)(4)(A).

8.4 Survival of Indemnification. Notwithstanding any contrary provision contained in this Agreement, any election hereunder or any termination of this Agreement, and whether or not this Agreement is otherwise carried out, the provisions of Section 5 shall remain in full force and effect and shall not be in any way affected by, such election or termination or failure to carry out the terms of this Agreement or any part hereof.

8.5 Representations, Warranties, Agreements to Survive. All representations, warranties and agreements contained in this Agreement or in certificates of officers of the Company submitted pursuant hereto, shall remain operative and in full force and effect regardless of (i) any investigation made by or on behalf of any Underwriter or its affiliates or selling agents, any person controlling any Underwriter, its officers or directors or any person controlling the Company or (ii) delivery of and payment for the Public Securities.

9. Miscellaneous.

9.1 Notices. All communications hereunder, except as herein otherwise specifically provided, shall be in writing and shall be mailed (registered or certified mail, return receipt requested), personally delivered or sent by facsimile transmission and confirmed and shall be deemed given when so delivered or faxed and confirmed or if mailed, two (2) days after such mailing.

If to the Representative:

Kingswood Capital Markets
17 Battery Place, Suite 625
New York, New York 10004
Attn: Joseph T. Rallo

with a copy (which shall not constitute notice) to:

The NBD Group, Inc.
350 N. Glendale Ave, Suite B522
Glendale, California 91206
Attn: Sara L. Terheggen, Esq.
Email: st@nbdpro.com

If to the Company:

Protagenic Therapeutics, Inc.

149 Fifth Avenue
New York, New York. 10010
Attn: Garo Armen, Executive Chairman
Email: armen@agenusbio.com

with a copy (which shall not constitute notice) to:

Duane Morris LLP
1540 Broadway
New York, New York 10036
Attn: Dean M. Colucci, Esq.
Email: dmcolucci@duanemorris.com

9.2 Headings. The headings contained herein are for the sole purpose of convenience of reference, and shall not in any way limit or affect the meaning or interpretation of any of the terms or provisions of this Agreement.

9.3 Amendment. This Agreement may only be amended by a written instrument executed by each of the parties hereto.

9.4 Entire Agreement. This Agreement (together with the other agreements and documents being delivered pursuant to or in connection with this Agreement) constitutes the entire agreement of the parties hereto with respect to the subject matter hereof and thereof, and supersedes all prior agreements and understandings of the parties, oral and written, with respect to the subject matter hereof.

9.5 Binding Effect. This Agreement shall inure solely to the benefit of and shall be binding upon the Representative, the Underwriters, the Company and the controlling persons, directors and officers referred to in Section 5 hereof, and their respective successors, legal representatives, heirs and assigns, and no other person shall have or be construed to have any legal or equitable right, remedy or claim under or in respect of or by virtue of this Agreement or any provisions herein contained. The term “successors and assigns” shall not include a purchaser, in its capacity as such, of securities from any of the Underwriters.

28

9.6 Governing Law; Consent to Jurisdiction; Trial by Jury. This Agreement shall be governed by and construed and enforced in accordance with the laws of the State of New York, without giving effect to conflict of laws principles thereof. The Company hereby agrees that any action, proceeding or claim against it arising out of, or relating in any way to this Agreement shall be brought and enforced in the New York Supreme Court, County of New York, or in the United States District Court for the Southern District of New York, and irrevocably submits to such jurisdiction, which jurisdiction shall be exclusive. The Company hereby waives any objection to such exclusive jurisdiction and that such courts represent an inconvenient forum. Any such process or summons to be served upon the Company may be served by transmitting a copy thereof by registered or certified mail, return receipt requested, postage prepaid, addressed to it at the address set forth in Section 9.1 hereof. Such mailing shall be deemed personal service and shall be legal and binding upon the Company in any action, proceeding or claim. The Company agrees that the prevailing party(ies) in any such action shall be entitled to recover from the other party(ies) all of its reasonable attorneys’ fees and expenses relating to such action or proceeding and/or incurred in connection with the preparation therefor. The Company (on its behalf and, to the extent permitted by applicable law, on behalf of its stockholders and affiliates) and each of the Underwriters hereby irrevocably waives, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Agreement or the transactions contemplated hereby.

9.7 Execution in Counterparts. This Agreement may be executed in one or more counterparts, and by the different parties hereto in separate counterparts, each of which shall be deemed to be an original, but all of which taken together shall constitute one and the same agreement, and shall become effective when one or more counterparts has been signed by each of the parties hereto and delivered to each of the other parties hereto. Delivery of a signed counterpart of this Agreement by facsimile or email/pdf transmission shall constitute valid and sufficient delivery thereof.

9.8 Waiver, etc. The failure of any of the parties hereto to at any time enforce any of the provisions of this Agreement shall not be deemed or construed to be a waiver of any such provision, nor to in any way effect the validity of this Agreement or any provision hereof or the right of any of the parties hereto to thereafter enforce each and every provision of this Agreement. No waiver of any breach, non-compliance or non-fulfillment of any of the provisions of this Agreement shall be effective unless set forth in a written instrument executed by the party or parties against whom or which enforcement of such waiver is sought; and no waiver of any such breach, non-

compliance or non-fulfillment shall be construed or deemed to be a waiver of any other or subsequent breach, non-compliance or non-fulfillment.

[Signature Page Follows]

If the foregoing correctly sets forth the understanding between the Underwriters and the Company, please so indicate in the space provided below for that purpose, whereupon this letter shall constitute a binding agreement between us.

Very truly yours,

PROTAGENIC THERAPEUTICS, INC.

By: _____
Name:
Title:

Confirmed as of the date first written above mentioned, on behalf of itself and as Representative of the several Underwriters named on Schedule 1 hereto:

KINGSWOOD CAPITAL MARKETS,
division of Benchmark Investments, Inc.

By: _____
Name:
Title:

[Signature Page]
PROTAGENIC THERAPEUTICS, INC. – UNDERWRITING AGREEMENT

SCHEDULE 1

Underwriter	Total Number of Firm Shares and Accompanying Firm Warrants to be Purchased	Number of Option Shares and Accompanying Option Warrants to be Purchased if the Over-Allotment Option is Fully Exercised
Kingswood Capital Markets, division of Benchmark Investments, Inc.		
Brookline Capital Markets, a division of Arcadia Securities, LLC		
TOTAL		

SCHEDULE 2-A
Pricing Information

Number of Firm Shares and Accompanying Firm Warrants:
Number of Option Shares and Accompanying Option Warrants:
Public Offering Price: \$
Underwriting Discount per Share and Accompanying Warrant: \$
Proceeds to Company per Firm Share (before expenses): \$
Proceeds to Company per Option Share (before expenses): \$

SCHEDULE 2-B

Issuer General Use Free Writing Prospectuses

[None.]

SCHEDULE 3

List of Lock-Up Parties

1. Garo Armen
 2. Alexander Arrow
 3. Robert Stein
 4. Andrew Slee
 5. Khalil Barrage
 6. Josh Silverman
 7. Brian Corvese
 8. Jennifer Buell
-

EXHIBIT B

Lock-Up Agreement

March __, 2021

KINGSWOOD CAPITAL MARKETS,
division of Benchmark Investments, Inc.
as Representative of the Underwriters
17 Battery Place, Suite 625
New York, New York 10004

Ladies and Gentlemen:

The undersigned understands that Kingswood Capital Markets, division of Benchmark Investments, Inc. as representative of the underwriters (the “**Representative**”) proposes to enter into an Underwriting Agreement (the “**Underwriting Agreement**”) with Protagenic Therapeutics, Inc., a Delaware corporation (the “**Company**”), providing for the public offering (the “**Public Offering**”) of shares of common stock, par value \$0.0001 per share, of the Company (the “**Common Stock**”) and Warrants to purchase shares of Common Stock (the “**Warrants**”, and collectively with the Common Stock, the “**Securities**”).

To induce the Representative to continue its efforts in connection with the Public Offering, the undersigned hereby agrees that, without the prior written consent of the Representative, the undersigned will not, during the period commencing on the date hereof and ending 180 days after the date of the final prospectus (the “**Prospectus**”) relating to the Public Offering (the “**Lock-Up Period**”), (1) offer, pledge, sell, contract to sell, grant, lend, or otherwise transfer or dispose of, directly or indirectly, any Securities or any securities convertible into or exercisable or exchangeable for Securities, 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**”); (2) enter

into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of the Lock-Up Securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of Lock-Up Securities, in cash or otherwise; (3) make any demand for or exercise any right with respect to the registration of any Lock-Up Securities; or (4) publicly disclose the intention to make any offer, sale, pledge or disposition, or to enter into any transaction, swap, hedge or other arrangement relating to any Lock-Up Securities. Notwithstanding the foregoing, and subject to the conditions below, the undersigned may transfer Lock-Up Securities without the prior written consent of the Representative in connection with (a) transactions relating to Lock-Up Securities acquired in open market transactions after the completion of the Public Offering; provided that no filing under Section 13 or Section 16(a) of the Securities Exchange Act of 1934, as amended (the “**Exchange Act**”), or other public announcement shall be required or shall be voluntarily made during the Lock-Up Period in connection with subsequent sales of Lock-Up Securities acquired in such open market transactions; (b) transfers of Lock-Up Securities as a *bona fide* gift, by will or intestacy or to a family member or trust for the benefit of a family member (for purposes of this lock-up agreement, “family member” means any relationship by blood, marriage or adoption, not more remote than first cousin); (c) transfers of Lock-Up Securities to a charity or educational institution; or (d) if the undersigned, directly or indirectly, controls a corporation, partnership, limited liability company or other business entity, any transfers of Lock-Up Securities to any shareholder, partner or member of, or owner of similar equity interests in, the undersigned, as the case may be; provided that in the case of any transfer pursuant to the foregoing clauses (b), (c) or (d), (i) it shall be a condition to any such transfer that (i) the transferee/donee agrees to be bound by the terms of this lock-up agreement (including, without limitation, the restrictions set forth in the preceding sentence) to the same extent as if the transferee/donee were a party hereto; (ii) each party (donor, donee, transferor or transferee) shall not be required by law (including without limitation the disclosure requirements of the Securities Act of 1933, as amended (the “**Securities Act**”), and the Exchange Act) to make, and shall agree to not voluntarily make, any filing or public announcement of the transfer or disposition prior to the expiration of the Lock-Up Period; and (iii) the undersigned notifies the Representative at least two (2) business days prior to the proposed transfer or disposition.

In addition, the foregoing restrictions shall not apply to (i) the exercise of stock options granted pursuant to the Company’s equity incentive plans or to any of the undersigned’s common stock issued upon such exercise, (ii) exercise of warrants; provided that it shall apply to any of the undersigned’s common stock issued upon such exercise, or (iii) pursuant to an existing contract, instruction or plan (a “**Plan**”) that satisfies all of the requirements of Rule 10b5-1(c)(1)(i)(B) under the Exchange Act, (iv) the establishment of any new Plan; provided that no sales of the undersigned’s common stock shall be made pursuant to such new Plan prior to the expiration of the Lock-Up Period (as such may have been extended pursuant to the provisions hereof), and such a Plan may only be established if no public announcement of the establishment or existence thereof and no filing with the Securities and Exchange Commission or other regulatory authority in respect thereof or transactions thereunder or contemplated thereby, by the undersigned, the Company or any other person, shall be required, and no such announcement or filing is made voluntarily, by the undersigned, the Company or any other person, prior to the expiration of the Lock-Up Period (as such may have been extended pursuant to the provisions hereof).

The undersigned also agrees and consents to the entry of stop transfer instructions with the Company’s transfer agent and registrar against the transfer of the undersigned’s securities subject to this lock-up agreement except in compliance with this lock-up agreement.

If the undersigned is an officer or director of the Company, (i) the undersigned agrees that the foregoing restrictions shall be equally applicable to any Securities that the undersigned may purchase in the Public Offering; (ii) the Representative agrees that, at least three (3) business days before the effective date of any release or waiver of the foregoing restrictions in connection with a transfer of Lock-Up Securities, the Representative will notify the Company of the impending release or waiver; and (iii) the Company has agreed in the Underwriting Agreement to announce the impending release or waiver by press release through a major news service at least two (2) business days before the effective date of the release or waiver. Any release or waiver granted by the Representative hereunder to any such officer or director shall only be effective two (2) business days after the publication date of such press release. The provisions of this paragraph will not apply if (a) the release or waiver is effected solely to permit a transfer of Lock-Up Securities not for consideration and (b) the transferee has agreed in writing to be bound by the same terms described in this lock-up agreement to the extent and for the duration that such terms remain in effect at the time of such transfer.

The undersigned understands that the Company and the Representative are relying upon this lock-up agreement in proceeding toward consummation of the Public Offering. The undersigned further understands that this lock-up agreement is irrevocable and shall be binding upon the undersigned’s heirs, legal representatives, successors and assigns.

The undersigned understands that, if the Underwriting Agreement does not become effective on or prior to April 30, 2021, or if the Underwriting Agreement (other than the provisions thereof which survive termination) shall terminate or be terminated prior to

payment for and delivery of the Securities to be sold thereunder, the undersigned shall be released from all obligations under this lock-up agreement.

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

Very truly yours,

(Name - Please Print)

(Signature)

(Name of Signatory, in the case of entities - Please Print)

(Title of Signatory, in the case of entities - Please Print)

Address: _____

NEW YORK
LONDON
SINGAPORE
PHILADELPHIA
CHICAGO
WASHINGTON, DC
SAN FRANCISCO
SILICON VALLEY
SAN DIEGO
SHANGHAI
BOSTON
HOUSTON
LOS ANGELES
HANOI
HO CHI MINH CITY

DuaneMorris®

FIRM and AFFILIATE OFFICES

www.duanemorris.com

ATLANTA
BALTIMORE
WILMINGTON
MIAMI
BOCA RATON
PITTSBURGH
NEWARK
LAS VEGAS
CHERRY HILL
LAKE TAHOE
MYANMAR
OMAN
A GCC REPRESENTATIVE
OFFICE
OF DUANE MORRIS

MEXICO CITY
ALLIANCE WITH
MIRANDA & ESTAVILLO
SRI LANKA
ALLIANCE WITH
GOWERS INTERNATIONAL

April 9, 2021

Protagenic Therapeutics Inc.
149 Fifth Avenue, Suite 500
New York, NY 10010

Re: Protagenic Therapeutics Inc. (the “**Company**”) Registration Statement on Form S-1 (the “**Registration Statement**”)

Ladies and Gentlemen:

We have acted as special counsel to the Company, a corporation incorporated under the laws of the State of Delaware, in connection with the filing of the Registration Statement on Form S-1 with the Securities and Exchange Commission (the “**Commission**”) under the Securities Act of 1933, as amended (the “**Securities Act**”). The Registration Statement relates to the proposed registration by the Company of up to \$20,125,000 of units (the “**Units**”), consisting of one share of the Company’s common stock, par value \$0.0001 per share, (“**Common Stock**”) to be issued directly (such shares of Common Stock, the “**Shares**”), warrants (the “**Warrants**”) representing the right to purchase one-half of an additional share of Common Stock in an aggregate amount equal to one-half the number of the Shares (the “**Warrant Shares**”), and the issuance of the Warrant Shares upon exercise of the Warrants. The Shares, the Warrants, and the Warrant Shares are collectively referred to herein as the “**Securities.**”

In that connection, we have examined originals, or copies certified or otherwise identified to our satisfaction, of such documents, corporate records and other instruments as we have deemed necessary for the purposes of this opinion, including (i) the Third Amended and Restated Certificate of Incorporation of the Company in the form filed as Exhibit 3.1 to the Registration Statement, as filed with the Secretary of State of the State of Delaware on June 15, 2016 (the “**Certificate of Incorporation**”); (ii) the Second Amended and Restated Bylaws of the Company in the form filed as Exhibit 3.3 to the Registration Statement, as filed with the Commission on June 1, 2018; (iii) the Underwriting Agreement in the form filed as Exhibit 1.1 to the Registration Statement (the “**Underwriting Agreement**”); (iv) resolutions of the board of directors of the Company; and (v) the Registration Statement.

DUANE MORRIS LLP A DELAWARE LIMITED LIABILITY PARTNERSHIP
ONE RIVERFRONT PLAZA, 1037 RAYMOND BLVD., SUITE 1800
NEWARK, NJ 07102-5429

GREGORY R. HAWORTH, RESIDENT PARTNER
PHONE: +1 973 424 2000 FAX: +1 973 424 2001

Protagenic Therapeutics Inc.
April 9, 2021
Page 2

For purposes of this opinion, we have assumed the authenticity of all documents submitted to us as originals, the conformity to the originals of all documents submitted to us as copies and the authenticity of the originals of all documents submitted to us as copies. We have also assumed the legal capacity of all natural persons, the genuineness of the signatures of persons signing all documents in connection with which this opinion is rendered, the authority of such persons signing on behalf of the parties thereto and the due authorization, execution and delivery of all documents by the parties thereto other than the Company. We have not independently established or verified any facts relevant to the opinion expressed herein, but have relied upon statements and representations of officers and other representatives of the Company and others as to factual matters.

Based upon and subject to the foregoing qualifications, assumptions and limitations and the further limitations set forth below, we are of the opinion that, upon (i) due action by the board of directors of the Company or a duly appointed committee thereof to determine the price per share of the Shares, (ii) the due execution and delivery of the Underwriting Agreement by the parties thereto, (iii) the effectiveness of the Registration Statement under the Act,

(i) the Shares will have been duly authorized and, when issued upon receipt by the Company of the consideration therefore, will be validly issued, fully paid and non-assessable ;

(ii) the Warrants will have been duly authorized and, when duly executed and delivered by the Company in the manner and for consideration therefor, will constitute valid and legally binding obligations of the Company; and

(iii) the Warrant Shares, if and when issued, paid for and delivered in compliance with the terms of the Warrants and in compliance with the terms of the Company's Certificate of Incorporation as in effect from time to time, will be validly issued, fully paid and non-assessable.

The foregoing opinions are qualified to the extent that the enforceability of any document, instrument or the Warrants may be limited by or subject to bankruptcy, insolvency, fraudulent transfer or conveyance, reorganization, moratorium or other similar laws relating to or affecting creditors' rights generally, and general equitable or public policy principles.

Our opinions expressed above are subject to the qualifications that we express no opinion as to the applicability of, compliance with, or effect of any laws except the General Corporation Law of the State of Delaware.

We hereby consent to the filing of this opinion with the Commission as Exhibit 5.1 to the Registration Statement. We also consent to the reference to our firm under the heading "Legal Matters" in the Registration Statement. In giving this consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission.

We do not find it necessary for the purposes of this opinion, and accordingly we do not purport to cover herein, the application of the securities or "Blue Sky" laws of the various states to the offering of the Securities pursuant to the Registration Statement.

Protagenic Therapeutics Inc.
April 9, 2021
Page 3

This opinion letter is given to you solely for use in connection with the offer and sale of the Securities while the Registration Statement is in effect and is not to be relied upon for any other purpose. This opinion is limited to the specific issues addressed herein, and no opinion may be inferred or implied beyond that expressly stated herein. We assume no obligation to revise or supplement this opinion should the General Corporation Law of the State of Delaware be changed by legislative action, judicial decision or otherwise.

Very truly yours,

/s/ Duane Morris LLP

FORM OF WARRANT AGENT AGREEMENT

THIS WARRANT AGENT AGREEMENT (this “**Agreement**”) is dated April [], 2021, between PROTAGENIC THERAPEUTICS, INC., a Delaware corporation (the “**Company**”), and AMERICAN STOCK TRANSFER & TRUST COMPANY, LLC, acting as warrant agent (the “**Warrant Agent**”).

WHEREAS, the Company proposes to issue common stock purchase warrants (the “**Warrants**”) to acquire up to _____ shares of common stock, par value \$0.0001 per share (“**Common Stock**”), subject to adjustment as provided herein, of the Company (collectively, the “**Warrant Shares**”);

WHEREAS, each Warrant shall represent the right to purchase from the Company, at an initial price of \$[] per share 125% of the public offering price (the “**Exercise Price**”), one share of Common Stock, subject to adjustment as provided hereunder; and

WHEREAS, American Stock Transfer & Trust Company, LLC is willing to serve as the Warrant Agent in connection with the issuance of Warrant Certificates (as defined below) and the other matters as provided herein.

NOW, THEREFORE, in consideration of the foregoing and for the purpose of defining the terms and provisions of the Warrants and the respective rights and obligations thereunder of the Company, the Warrant Agent and the record holders from time to time of the Warrants or, if the Warrants are held in “street name,” a Participant (as defined below) or a designee appointed by such Participant (each, a “**Holder**” and collectively, the “**Holders**”), the parties hereby agree as follows:

1. Definitions. For the purposes hereof, the following terms shall have the following meanings:

“**Aggregate Exercise Price**” means, with respect to each exercise of Warrants held by the Holder, the Exercise Price multiplied by the aggregate number of Warrant Shares (which must be a whole number) that such Holder intends to purchase pursuant to such exercise.

“**Business Day**” means any day except Saturday, Sunday and any day which shall be a federal legal holiday in the United States or a day on which banking institutions in The City of New York are authorized or required by law or other government action to close.

“**Common Stock**” shall have the meaning set forth in the first WHEREAS clause.

“**Date of Exercise**” means the date on which the Holder shall have delivered to the Warrant Agent an appropriately completed and duly signed Form of Election to Purchase (with the Warrant Shares Exercise Log attached to it and reference to the relevant Warrant Certificate sufficient to identify it).

“**Exchange Act**” means the Securities Exchange Act of 1934, as amended, and the rules and regulations of the Securities and Exchange Commission (the “**Commission**”) promulgated thereunder.

“**Exercise Price**” shall have the meaning set forth in the second WHEREAS clause.

“**Expiration Date**” means April [], 2025.

“**Form of Election to Purchase**” means a Form of Election to Purchase substantially in the form attached to the Warrant.

“**Initial Exercise Date**” means April [], 2021.

“**Initial Issuance Date**” means April [], 2021.

“**Person**” means a corporation, association, partnership, limited liability corporation, organization, business, individual, trust, government or political subdivision thereof or governmental agency.

“**Prospectus**” means the final prospectus relating to the Warrant Shares included in the Registration Statement.

“**Redemption Date**” shall have the meaning set forth in Section 8(b).

“**Redemption Price**” shall have the meaning set forth in Section 8(b).

“**Registration Statement**” means, collectively, the various parts of the registration statement prepared by the Company on Form S-1 (File No. 333-_____) with respect to the Warrant Shares, each as amended as of the date hereof, including the Prospectus therein and all exhibits filed with such registration statement.

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

“**Trading Day**” means (i) a day on which the shares of Common Stock are traded on the Trading Market on which the shares of Common Stock are then listed or quoted, or (ii) if the shares of Common Stock are not listed on any such Trading Market, a day on which the shares of Common Stock are traded in the over-the-counter market, as reported by the OTC Markets; provided, that in the event that the shares of Common Stock are not listed or quoted as set forth in clause (i) or (ii) hereof, then Trading Day shall mean a Business Day.

“**Trading Market**” means the New York Stock Exchange, the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market or the Nasdaq Global Select Market.

“**VWAP**” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is the principal market on which the Common Stock is traded, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on the OTC (“Pink”) Markets (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

“**Warrant Certificate**” means a certificate in substantially the form attached hereto as Exhibit A representing such number of Warrants set forth on the Warrant Certificate.

“**Warrants**” shall have the meaning set forth in the first WHEREAS clause.

“**Warrant Shares**” shall have the meaning set forth in the first WHEREAS clause.

2. Form of Warrant.

(a) Warrants in Global Form. The Warrants shall initially be issuable in book-entry registration only and evidenced by one or more global Warrant Certificates (the “**Global Warrant Certificates**”) deposited with the Depository Trust Company (the “**Depository**”) and registered in the name of Cede & Co. (“**Cede**”), a nominee of the Depository. Ownership of beneficial interests in the Warrants shall be shown on, and the transfer of such ownership shall be effected through, records maintained by (i) the Depository or its nominee for each Global Warrant Certificate or (ii) institutions that have accounts with the Depository (such institutions, with respect to a Warrant in its account, each a “**Participant**”). For purposes of this Agreement, the delivery of a notice from the Depository or a Participant of the transfer or exercise of Warrants in the form of a Global Warrant Certificate shall be deemed to constitute the delivery of a Warrant Certificate with respect to such transfer or exercise. If the Depository subsequently ceases to make its book-entry settlement system available for the Warrants, the Company may instruct the Warrant Agent regarding other arrangements for book-entry settlement. If the Company determines, in its sole discretion, not to have securities represented by the Global Warrant Certificates, the Company will instruct the Warrant Agent to prepare and deliver physical certificates evidencing the Warrants in exchange for the beneficial interests in the Global Warrant Certificates, based on directions received by the Depository from its Participants with respect to ownership of beneficial interests in the Global Warrant Certificates. In such event, any physical certificates evidencing the Warrants shall represent

one or more Warrants as set forth on the Warrant Certificate and be issued in registered form only as definitive Warrant Certificates and shall be substantially in the form attached hereto as Exhibit A, shall be dated the date of issuance thereof (whether upon initial issuance, register of transfer, exchange or replacement) and shall bear such legends and endorsements typed, stamped, printed, lithographed or engraved thereon as the Company may deem appropriate and as are not inconsistent with the provisions of this Agreement.

(b) Effect of Signature. Warrant Certificates shall be signed by, or bear the facsimile or electronic signature of, the chief executive officer, president, chairperson of the board, chief financial officer, treasurer, any vice president, or secretary of the Company. In the event the person whose facsimile or electronic signature has been placed upon any Warrant Certificate shall have ceased to serve in the capacity in which such person signed the Warrant Certificate before such Warrant Certificate is issued, it may be issued with the same effect as if he or she had not ceased to be such at the date of issuance.

3

(c) Effect of Countersignature. Unless and until countersigned by the Warrant Agent pursuant to this Agreement, a Warrant Certificate shall be invalid and of no effect and may not be exercised by the holder thereof. Such signature by the Warrant Agent upon any Warrant Certificate executed by the Company shall be conclusive evidence that such Warrant Certificate has been duly issued under the terms of this Agreement.

(d) Warrant Register. The Warrant Agent shall maintain books (the “**Warrant Register**”), for the registration of original issuance and the registration of transfer of the Warrants. Upon the initial issuance of the Warrants, the Warrant Agent shall issue and register the Warrants in the names of the respective holders thereof in such denominations and otherwise in accordance with instructions delivered to the Warrant Agent by or on behalf of the Company. The Company and the Warrant Agent may deem and treat the registered Holder of each Warrant Certificate as the absolute owner of the Warrants represented thereby for the purpose of any exercise thereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary. Any Person in whose name ownership of a beneficial interest in the Warrants evidenced by a Global Warrant Certificate is recorded in the records maintained by the Depository or its nominee shall be deemed the “beneficial owner” thereof; provided, that all such beneficial interests shall be held through a Participant, which shall be the registered holder of such Warrants.

(e) Registration of Transfers. The Warrant Agent shall register the transfer of any portion of a Warrant Certificate in the Warrant Register, upon surrender of the Warrant Certificate, with the Form of Assignment attached thereto, to the Warrant Agent at its address specified for notice set forth in Section 14 below. Upon any such registration or transfer, a new Warrant Certificate substantially in the form attached hereto as Exhibit A (any such new Warrant Certificate, a “**New Warrant Certificate**”), evidencing the portion of the Warrant Certificate so transferred shall be issued to the transferee and a New Warrant Certificate evidencing the remaining portion of the Warrant Certificate not so transferred, if any, shall be issued to the transferring Holder. Upon issuance and delivery of the New Warrant Certificate, the Warrant Certificate surrendered to the Warrant Agent shall be clearly marked “cancelled” or bear a similar statement to that effect. The delivery of the New Warrant Certificate by the Warrant Agent to the transferee thereof shall be deemed to constitute acceptance by such transferee of all of the rights and obligations of a holder of a Warrant Certificate. Notwithstanding the foregoing, so long as the Warrants are evidenced by Global Warrant Certificates deposited with the Depository, ownership of beneficial interests in the Warrants shall be shown on, and the transfer of such ownership shall be effected through, records maintained (i) by the Depository or its nominee for each Warrant; (ii) by Participants; or (iii) directly on the book-entry records of the Warrant Agent with respect only to owners of beneficial interests that represent such direct registration.

(f) Warrants in Uncertificated Form. Notwithstanding the foregoing and anything else herein to the contrary, the Warrants may be issued in uncertificated form if so specified by the Company.

4

3. Term of Warrants. Warrants shall be exercisable by the registered Holder at any time and from time to time on or after the Initial Exercise Date until 5:00 p.m. (New York time) on the Expiration Date. At 5:00 p.m. (New York time) on the Expiration Date, any Warrant not exercised prior thereto (including without limitation, by payment of the applicable Aggregate Exercise Price on or prior to 5:00 p.m. (New York time) on the Expiration Date) shall be and become void and of no value.

4. Exercise of Warrants and Delivery of Warrant Shares.

(a) Exercise Procedure. At such times, and upon such representations and agreements, upon delivery of an appropriately completed and duly signed Form of Election to Purchase (with the Warrant Shares Exercise Log attached and reference to the applicable

Warrant Certificate sufficient to identify it) to the Warrant Agent (or, in the case of a Global Warrant Certificate, properly delivered by the Participant in accordance with the Depository's procedures), at its address for notice set forth in Section 14, and payment of the Aggregate Exercise Price by the date that is one (1) Trading Day after the Date of Exercise, the Company shall, on or prior to the date that is the later of (A) the date that is three (3) Trading Days after the Date of Exercise and (B) the date that is two (2) Trading Days after the date on which the Aggregate Exercise Price has been paid in accordance with Section 10 below (such later date, the "**Warrant Share Delivery Date**"), (i) provided that the Company's transfer agent (the "**Transfer Agent**") is participating in the Depository's Fast Automated Securities Transfer Program and an effective registration statement is available for the issuance of the Warrant Shares, or (ii) if the Transfer Agent is not participating in the Depository's Fast Automated Securities Transfer Program, issue and dispatch by overnight courier to the address as specified in the Form of Election to Purchase, a certificate, registered in the Company's share register in the name of the Holder or its designee, for the number of shares of Common Stock to which the Holder is entitled pursuant to such exercise. Any Person so designated by the Holder to receive Warrant Shares shall be deemed to have become holder of record of such Warrant Shares as of the time that the Holder shall have delivered to the Warrant Agent an appropriately completed and duly signed Form of Election to Purchase (with the Warrant Shares Exercise Log attached to it and reference to the relevant Warrant Certificate sufficient to identify it), provided that the Holder delivers the Aggregate Exercise Price by the date that is one (1) Trading Day after the Date of Exercise.

(b) If the Holder delivers a Form of Election to Purchase but fails, within one Trading Day after the Date of Exercise, to deliver the Aggregate Exercise Price, then the Holder shall only be deemed to be the holder of record of the Warrant Shares upon delivery of the Aggregate Exercise Price, so long as such Aggregate Exercise Price is delivered within three (3) Trading Days of the Date of Exercise.

(c) No ink-original Form of Election to Purchase shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Form of Election to Purchase be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender any Warrant Certificate to the Company or Warrant Agent until all of the Warrant Shares issuable thereunder have been purchased and all of the Warrants evidenced by such Warrant Certificate have been exercised in full, in which case, the Holder shall surrender such Warrant Certificate to the Company or Warrant Agent for cancellation within five (5) Trading Days of the date the final Form of Election to Purchase is delivered to the Warrant Agent. Partial exercises of such Warrant Certificate resulting in purchases of a portion of the total number of Warrant Shares available thereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable thereunder in an amount equal to the applicable number of Warrant Shares purchased. **The Holder and any assignee, by acceptance of a Warrant Certificate, acknowledge and agree that, by reason of the provisions of this subsection, following a partial exercise of such Warrant Certificate, the number of Warrant Shares issuable upon exercise of such Warrant Certificate at any given time may be less than the amount stated on the face thereof.**

(d) If fewer than all Warrant Shares issuable upon exercise of the relevant Warrant Certificate are purchased upon any exercise thereof, then promptly following the date on which the Holder has taken all actions necessary under the terms of this Agreement for such Holder to receive Warrant Shares and be deemed to have become the holder of record of such Warrant Shares and at the request of the Holder (provided that the Holder has delivered the original physical Warrant Certificate to the Warrant Agent for cancellation), the Company will execute and deliver to the Holder or its assigns a New Warrant Certificate (dated the date such Holder is deemed to have become the holder of record of such Warrant Shares) evidencing the unexercised portion of the relevant Warrant Certificate. If fewer than all the Warrants evidenced by a Global Warrant Certificate are exercised, a notation shall be made to the records maintained by the Depository, its nominee for each Global Warrant Certificate, or a Participant, as appropriate, evidencing the balance of the Warrants remaining after such exercise.

(e) In addition to any other rights available to the Holder, if the Holder has taken all actions necessary under the terms of this Agreement for such Holder to receive Warrant Shares subject to a Form of Election to Purchase on a Warrant Share Delivery Date and the Company fails, or fails to cause the Warrant Agent, to transmit to the Holder the Warrant Shares in accordance with the provisions of subsection 4(a) above on or before the applicable Warrant Share Delivery Date, and if after such date the Holder is required by its broker to purchase (in an open market transaction or otherwise) or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by the Holder of the Warrant Shares which the Holder anticipated receiving upon such exercise (a "**Buy-In**"), then the Company shall (A) pay in cash to the Holder the amount, if any, by which (x) the Holder's total purchase price (including brokerage commissions, if any) for the shares of Common Stock so purchased exceeds (y) the amount obtained by multiplying (1) the number of Warrant Shares that the Company was required to deliver to the Holder in connection with the exercise at issue times (2) the price at which the sell order giving rise to such purchase obligation was executed, and (B) at the option of the Holder, either reinstate the portion of the Warrant and equivalent number of Warrant Shares for which such exercise was not honored (in which case such exercise shall be deemed rescinded) or deliver to the Holder the number of shares of Common Stock that would have been issued had the Company timely complied with its exercise and delivery obligations hereunder. For example, if the Holder purchases shares of

Common Stock having a total purchase price of \$11,000 to cover a Buy-In with respect to an attempted exercise of shares of Common Stock with an aggregate sale price giving rise to such purchase obligation of \$10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder \$1,000. The Holder shall provide the Company written notice indicating the amounts payable to the Holder in respect of a Buy-In and evidence of the amount of such loss.

(f) If at the time of exercise hereof there is no effective registration statement registering, or the prospectus contained therein is not available for the issuance of the Warrant Shares to the Holder, then this Warrant may also be converted, in whole or in part, into Common Stock at such time by means of a “cashless exercise” in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing [(A-B) (X)] by (A), where:

6

(A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Form of Election to Purchase if such Form of Election to Purchase is both executed and delivered pursuant to Section 4(a).

(B) = the Exercise Price of this Warrant, as then in effect; and

(X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If Warrant Shares are issued in such a cashless exercise, which is an exchange of the warrants for the Warrant Shares, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the characteristics of the Warrants being exercised. The Company agrees not to take any position contrary to this Section 4(f).

5. Charges, Taxes and Expenses. Issuance and delivery of certificates for Warrant Shares shall be made without charge to the Holder for any issue or transfer tax, or transfer agent fee in respect of the issuance of such certificates, all of which taxes shall be paid by the Company; provided, however, that the Company shall not be obligated to pay any tax which may be payable in respect of any transfer involved in the registration of any certificates for Warrant Shares or Warrants in a name other than that of the Holder. The Holder shall be responsible for all other tax liabilities that may arise as a result of holding or transferring any Warrant Certificate. The Company shall pay all Warrant Agent and Transfer Agent fees required for same-day processing of any Form of Election to Purchase and all fees to the Depository (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Warrant Shares.

6. Replacement of Warrant Certificate. If any Warrant Certificate is mutilated, lost, stolen or destroyed, the Company shall issue or cause to be issued in exchange and substitution for and upon cancellation thereof, or in lieu of and substitution for such Warrant Certificate, a New Warrant Certificate, but only upon receipt of evidence reasonably satisfactory to the Company of such loss, theft or destruction and customary and reasonable indemnity, if requested. Applicants for a New Warrant Certificate under such circumstances shall also comply with such other reasonable regulations and procedures and pay such other reasonable third-party costs as the Company may prescribe.

7. Reservation of Warrant Shares. The Company covenants that it will at all times reserve and keep available out of its authorized but unissued and otherwise unreserved Common Stock, solely for the purpose of enabling it to issue Warrant Shares upon exercise of all outstanding Warrants as herein provided, the number of Warrant Shares which are then issuable and deliverable upon the exercise of all outstanding Warrants (taking into account any adjustments pursuant to Section 8 below). The Company covenants that all Warrant Shares so issuable and deliverable shall, upon issuance and the payment of the applicable Exercise Price in accordance with the terms hereof, be duly and validly authorized and issued, and be fully paid and non-assessable.

7

8. Redemption of Warrants.

(a) Beginning _____, 2021, [90 days from the date of the Prospectus] outstanding Warrants may be redeemed at the option of the Company, in whole or in part on a pro-rata basis, by giving not less than 30 days' prior notice as provided in Section 8(c) below, which notice may not be given before, but may be given at any time after the date on which the closing price of the Company's common stock on the principal exchange or trading facility on which it is then traded has equaled or exceeded \$ ___ (175% of the public offering price of the Units) for five consecutive Trading Days.

(b) The price at which Warrants may be redeemed (the “**Redemption Price**”) is \$0.15 per Warrant. On and after the date upon which the Warrants are redeemed by the Company (the “**Redemption Date**”), the Warrant Holders of redeemed Warrants shall be entitled to payment of the Redemption Price upon surrender of the Warrant Certificates of such redeemed Warrants to the Warrant Agent (on behalf of the Company) at the office of the Warrant Agent.

(c) Notice of redemption of Warrants shall be given at least 30 days’ prior to the Redemption Date by the Company (i) notifying the Warrant Agent in writing of such redemption, (ii) notifying the Warrant Holders of such redemption via publication of a press release and (iii) taking such other steps as may be required under applicable law.

(d) From and after the Redemption Date, all rights of the Warrant Holders with respect to the redeemed Warrants (except the right to receive the Redemption Price) shall terminate, but only if (i) no later than one day prior to the Redemption Date the Company shall have irrevocably deposited with the Warrant Agent as paying agent a sufficient amount to pay on the Redemption Date the Redemption Price for all Warrants called for redemption and (ii) the notice of redemption shall have stated the name and address of the Warrant Agent and the intention of the Company to deposit such amount with the Warrant Agent no later than one day prior to the Redemption Date. Notwithstanding the foregoing, the Company will extend a three-day “protect” period beginning on and continuing two days after the Redemption Date so that any Warrant for which notice of exercise is received in the three business days prior to the Redemption Date shall be deemed exercised so long as the Exercise Price is received by the Warrant Agent no more than three business days after the notice of exercise is delivered to the Warrant Agent.

(e) On the Redemption Date, the Warrant Agent shall pay to the Warrant Holders of record of redeemed Warrants all monies received by the Warrant Agent for the redemption of Warrants to which the Warrant Holders of record of such redeemed Warrants who shall have surrendered their Warrant Certificates are entitled. The Warrant Agent shall have no obligation to pay for the redemption of Warrants except to the extent that funds for such payment have been provided to it by the Company.

8

(f) All amounts deposited with the Warrant Agent that are not required for redemption of Warrants may be withdrawn by the Company. Any amounts deposited with the Warrant Agent that shall be unclaimed after six months after the Redemption Date shall be redelivered back to the Company, and thereafter the Warrant Holders called for redemption for which such funds were deposited shall look solely to the Company for payment, it being understood that the Warrant Agent shall be under no obligation to report or remit unclaimed property to appropriate states in compliance with applicable law. The Company acknowledges that the bank accounts maintained by the Warrant Agent in connection with the services hereunder will be in its name and that the Warrant Agent may receive investment earnings in connection with the investment at the Warrant Agent’s risk and for its benefit of funds held in those accounts from time to time.

(g) If the Company fails to make a sufficient deposit with the Warrant Agent as provided above, the Warrant Holder called for redemption may at the option of the Warrant Holder (i) by notice to the Company declare the notice of redemption a nullity as to such Warrant Holder, or (ii) maintain an action against the Company for the Redemption Price. If the Warrant Holder brings such an action, the Company will pay reasonable attorneys’ fees of the holder. If the Warrant Holder fails to bring an action against the Company for the Redemption Price within 60 days after the Redemption Date, the Warrant Holder shall be deemed to have elected to declare the notice of redemption to be a nullity as to such Warrant Holder and such notice shall be without any force or effect as to such Warrant Holder. Except as otherwise specifically provided in this Section 8(g), a notice of redemption, once published by the Company as provided in Section 8(c) shall be irrevocable.

9. Certain Adjustments. The Exercise Price and number of Warrant Shares issuable upon exercise of each Warrant then outstanding are subject to adjustment from time to time as set forth in this Section 9.

(a) Stock Dividends and Splits. If the Company, (i) pays a dividend or distribution in the form of shares of its Common Stock on its Common Stock, (ii) subdivides outstanding shares of Common Stock into a greater number of shares or otherwise effects a stock split, or (iii) combines outstanding shares of Common Stock into a lesser number of shares or otherwise effects a reverse split, then in each such case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event. Any adjustment made pursuant to clause (i) of this subsection 9(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution, and any adjustment pursuant to clause (ii) or (iii) of this paragraph shall become effective immediately after the effective date of such subdivision or combination.

(b) Number of Warrant Shares. Simultaneously with any adjustment to the Exercise Price pursuant to subsection 9(a) above, the number of Warrant Shares that may be purchased upon exercise of each Warrant shall be increased or decreased proportionately, as the case may be, so that after such adjustment the aggregate Exercise Price payable hereunder for the adjusted number of Warrant Shares shall be the same as the aggregate Exercise Price in effect immediately prior to such adjustment.

9

(c) Certain Extraordinary Transactions. Except as provided in Section 8(d), in case of any consolidation or merger of the Company into another corporation (other than a merger in which the Company is the continuing corporation) or in case of any sale, lease or conveyance to another corporation of our property as an entirety in which the proceeds of the transaction are distributed to the Company's stockholders, the Company shall, as a condition precedent to such transaction, cause effective provisions to be made so that the holder of the Warrants shall have the right thereafter by exercising the Warrant, to purchase the kind and amount of shares of stock and other securities and property receivable upon such consolidation, merger, sale or conveyance by a holder of the number of shares of Common Stock which might have been purchased upon exercise of the warrant immediately prior to such consolidation, merger, sale or conveyance. Any such provision shall include provision for adjustments which shall be as nearly equivalent as may be practicable to the adjustments provided for in the warrant.

(d) Notice of Adjustments. Upon the occurrence of each adjustment pursuant to this Section 9, the Company at its expense will promptly calculate such adjustment in accordance with the terms of this Agreement and prepare a certificate setting forth such adjustment, including a statement of the adjusted Exercise Price and adjusted number of Warrant Shares or type of consideration issuable upon exercise of each Warrant (as applicable), describing the transactions giving rise to such adjustments and showing in detail the facts upon which such adjustment is based. The Company will reasonably promptly deliver or cause to be delivered to each Holder who makes a request in writing and to the Warrant Agent, a copy of each such certificate.

(e) Notice of Corporate Events. If the Company (i) declares a dividend or any other distribution of cash, securities or other property in respect of its Common Stock (other than a dividend payable solely in shares of Common Stock) or (ii) authorizes the voluntary dissolution, liquidation or winding up of the affairs of the Company, or (iii) proposed a transaction involving a merger, consolidation, sale of assets or similar transaction, including a proposed Specified Merger, then the Company shall deliver or cause to be delivered to each Holder a notice describing the material terms and conditions of such dividend, distribution or transaction. Notwithstanding anything to the contrary in this subsection 9(e), the failure to deliver any notice under this subsection 9(e) or any defect therein shall not affect the validity of the corporate action required to be described in such notice. Until the exercise of a Holder's Warrant or any portion of such Warrant, a Holder shall not have nor exercise any rights by virtue of ownership of a Warrant as a stockholder of the Company (including without limitation the right to notification of stockholder meetings or the right to receive any notice or other communication concerning the business and affairs of the Company other than as provided in this subsection 9(e)), except as expressly set forth in this Section 9.

(f) Notices to Holders on Registration Statement. If, at any time while any Warrants remain outstanding, the Registration Statement (or any subsequent registration statement registering the sale or resale of the Warrant Shares) is not effective or is not otherwise available for the sale of the Warrant Shares, the Company shall deliver notice to the record Holders that such registration statement is not then effective for the sale of Warrant Shares and shall deliver notice to the record Holders if and when the registration statement is effective again and available for the sale of the Warrant Shares (it being understood and agreed that the foregoing shall not limit the ability of any holder thereof to sell any of the Warrant Shares in compliance with applicable federal and state securities laws). The Company shall use its commercially reasonable best efforts to maintain a current and effective registration statement relating to the Warrant Shares until the expiration of the Warrants.

10

(g) To the extent that any notice provided to the Holders under this Agreement constitutes, or contains, material, non-public information regarding the Company or any of the Company's subsidiaries, the Company shall simultaneously file such notice with the Commission on a Current Report on Form 8-K.

10. Payment of Exercise Price. The Holder shall pay the Aggregate Exercise Price by paying, in lawful money of the United States, by certified check payable to the Warrant Agent, as agent for the Company, or bank draft payable to the order of the Company or by wire transfer of immediately available funds to an account designated in writing by the Company (or as otherwise agreed to by the Company) delivered to the Warrant Agent not later than one Trading Day after the Date of Exercise. Notwithstanding the foregoing, if

payment is made in any form other than a wire transfer of immediately available funds, neither the Warrant Agent nor the Company shall be required to issue Warrant Shares until the Warrant Agent's bank shall have confirmed that the payment has cleared, which date shall be the date that the Holder has made payment of the Exercise Price.

11. Holder Not Deemed a Stockholder. The Holder, solely in such Person's capacity as a Holder, shall not be entitled to vote or receive dividends or be deemed the holder of shares of the Company for any purpose, nor shall anything contained in the Warrants be construed to confer upon the Holder, solely in such Person's capacity as a Holder of Warrants, any of the rights of a stockholder of the Company or any right to vote, give or withhold consent to any corporate action (whether any reorganization, issue of stock, reclassification of stock, consolidation, merger, conveyance or otherwise), receive notice of meetings, receive dividends or subscription rights, or otherwise, prior to the issuance to the Holder of the Warrant Shares which such Person is then entitled to receive upon the due exercise of the Warrants, except as expressly set forth in Section 8.

12. No Fractional Shares. No fractional shares will be issued in connection with any exercise of a Warrant. In lieu of any fractional shares which would otherwise be issuable, the Company shall pay cash equal to the product of such fraction multiplied by the Exercise Price.

13. Exchange Act Filings. The Holder agrees and acknowledges that it shall have sole responsibility for making any applicable filings with the U.S. Securities and Exchange Commission pursuant to Sections 13 and 16 of the Exchange Act as a result of its acquisition of any Warrant and the Warrant Shares and any future retention or transfer thereof.

14. Notices. Any and all notices or other communications or deliveries hereunder (including without limitation any Form of Election to Purchase) shall be in writing and shall be deemed given and effective on the earliest of (a) the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number or by PDF sent by email specified in this Section 14 prior to 5:00 p.m. (New York time) on a Business Day, (b) the next Business Day after the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number or by PDF sent by email as specified in this Section 14 on a day that is not a Business Day or later than 5:00 p.m. (New York time) on any Business Day, (c) the Business Day following the date of mailing, if sent by nationally recognized overnight courier service which provides evidence of delivery, or (d) upon actual receipt by the party to whom such notice is required to be given. The addresses for such communications shall be:

11

if to the Company:

Protagenic Therapeutics, Inc.
149 Fifth Avenue
New York, New York 10010
Attention: Chief Financial Officer
Facsimile: [_____]
Email: alex.arrow@protagenic.com

if to the Warrant Agent:

American Stock Transfer & Trust Company, LLC
6201 15th Avenue
Brooklyn, NY 11219
Attention: Warrant Department
Facsimile: [_____]
Email: [_____]

if to the Holder:

to the address or facsimile number or email appearing on the Warrant Register or such other address or facsimile number as the Holder may provide to the Company in accordance with this Section 14.

15. Warrant Agent.

(a) The Company and the Warrant Agent hereby agree that the Warrant Agent will serve as an agent of the Company as set forth in this Agreement.

(b) The Warrant Agent shall not by any act hereunder be deemed to make any representation as to validity or authorization of the Warrants or the Warrant Certificates (except as to its countersignature thereon) or of any securities or other property delivered upon exercise of any Warrant, or as to the number or kind or amount of securities or other property deliverable upon exercise of any Warrant or the correctness of the representations of the Company made in such certificates that the Warrant Agent receives.

(c) The Warrant Agent shall not have any duty to calculate or determine any required adjustments with respect to the Exercise Price or the kind and amount of securities or other property receivable by Holders upon the exercise of Warrants, nor to determine the accuracy or correctness of any such calculation.

(d) The Warrant Agent shall not (i) be liable for any recital or statement of fact contained herein or in the Warrant Certificates or for any action taken, suffered or omitted by it in good faith in the belief that any Warrant Certificate or any other document or any signature is genuine or properly authorized, (ii) be responsible for any failure by the Company to comply with any of its obligations contained in this Agreement or in the Warrant Certificates, (iii) be liable for any act or omission in connection with this Agreement except for its own gross negligence or willful misconduct or (iv) have any responsibility to determine whether a transfer of a Warrant complies with applicable securities laws.

12

(e) The Warrant Agent is hereby authorized to accept instructions with respect to the performance of its duties hereunder solely on behalf of the Company from the Chief Executive Officer, the President, the Chief Financial Officer, or the Secretary or any Assistant Secretary of the Company and to apply to any such officer for written instructions (which will then be reasonably promptly given) and the Warrant Agent shall not be liable for any action taken or suffered to be taken by it in good faith in accordance with the instructions of any such officer, except for its own gross negligence or willful misconduct, but in its discretion the Warrant Agent may in lieu thereof accept other evidence of such or may require such further or additional evidence as it may deem reasonable.

(f) The Warrant Agent may exercise any of the rights and powers hereby vested in it or perform any duty hereunder either itself or by or through its attorneys, agents or employees, provided reasonable care has been exercised in the selection and in the continued employment of any persons. The Warrant Agent shall not be under any obligation or duty to institute, appear in or defend any action, suit or legal proceeding in respect hereof, unless first indemnified to its satisfaction. The Warrant Agent shall promptly notify the Company in writing of any claim made or action, suit or proceeding instituted against or arising out of or in connection with this Agreement.

(g) The Company will take such action as may reasonably be required by the Warrant Agent in order to enable it to carry out or perform its duties under this Agreement.

(h) The Warrant Agent shall act solely as agent of the Company hereunder. The Warrant Agent shall only be liable for the failure to perform such duties as are specifically set forth herein.

(i) The Warrant Agent may, at its own expense, consult with legal counsel satisfactory to it (who may be legal counsel for the Company), and the Warrant Agent shall incur no liability or responsibility to the Company or to any Holder for any action taken, suffered or omitted by it in good faith in accordance with the opinion or advice of such counsel.

(j) The Company agrees to pay to the Warrant Agent compensation for all services rendered by the Warrant Agent hereunder as the Company and the Warrant Agent may agree from time to time, and to reimburse the Warrant Agent for reasonable expenses incurred in connection with the execution and administration of this Agreement (including the reasonable compensation and expenses of its counsel), and further agrees to indemnify the Warrant Agent for, and hold it harmless against, any loss, liability or expense incurred without gross negligence, bad faith or willful misconduct on its part, arising out of or in connection with the acceptance and administration of this Agreement.

13

(k) No resignation or removal of the Warrant Agent and no appointment of a successor warrant agent shall become effective until the acceptance of appointment by the successor warrant agent as provided herein. The Warrant Agent may resign its duties

and be discharged from all further duties and liability hereunder (except liability arising as a result of the Warrant Agent's own gross negligence, bad faith or willful misconduct) after giving 60 days prior written notice to the Company. The Company may remove the Warrant Agent upon written notice, and the Warrant Agent shall thereupon in like manner be discharged from all further duties and liabilities hereunder, except as aforesaid. Upon such resignation or removal, the Company shall appoint in writing a new warrant agent. If the Company fails to do so within a period of 30 days after it has been notified in writing of such resignation by the resigning Warrant Agent or after such removal, then the resigning Warrant Agent or the Holder of any Warrant (if such Holder first submits his, her or its Warrant Certificate for inspection by the Company) may apply to any court of competent jurisdiction for the appointment of a new warrant agent, provided that, for purposes of this Agreement, the Company shall be deemed to be the Warrant Agent until a new warrant agent is appointed. After acceptance in writing of such appointment by the new warrant agent, it shall be vested with the same powers, rights, duties and responsibilities as if it had been originally named herein as the Warrant Agent. Not later than the effective date of any such appointment, the Company shall give notice thereof to the resigning or removed Warrant Agent. Failure to give any notice provided for in this subsection 15(k), however, or any defect therein, shall not affect the legality or validity of the resignation of the Warrant Agent or the appointment of a new warrant agent, as the case may be. The Company shall, or shall cause the successor Warrant Agent to, deliver to each Holder at such Holder's last address as shown on the register of Holders maintained by the Warrant Agent, notice of the appointment of the successor Warrant Agent and such successor Warrant Agent's address for communication.

(l) Any corporation into which the Warrant Agent or any new warrant agent may be merged or converted or any corporation resulting from any consolidation to which the Warrant Agent or any new warrant agent shall be a party or any corporation to which the Warrant Agent transfers substantially all of its corporate trust business shall be a successor Warrant Agent under this Agreement without any further act, provided that such corporation (i) would be eligible for appointment as successor to the Warrant Agent under the provisions of subsection 15(k) above or (ii) is a wholly owned subsidiary of the Warrant Agent. Any such successor Warrant Agent shall promptly cause notice of its succession as Warrant Agent to be mailed (by first class mail, postage prepaid) to each Holder in accordance with Section 14 above.

16. Miscellaneous.

(a) Successors and Assigns. This Agreement shall be binding on and inure to the benefit of the Company, the Warrant Agent and the Holders, and their respective successors and assigns. Subject to the preceding sentence, nothing in this Agreement shall be construed to give to any Person other than the Company, the Warrant Agent and the Holders any legal or equitable right, remedy or cause of action under this Agreement.

14

(b) Amendments and Waivers. The Company may, without the consent of the Holders, by supplemental agreement or otherwise, add to the covenants and agreements of the Company for the benefit of the Holders, or surrender any rights or power reserved to or conferred upon the Company in this Agreement, provided that such changes or corrections shall not adversely affect the interests of Holders of then outstanding Warrants in any respect. The Company may, with the consent, in writing or at a meeting, of the Holders of outstanding Warrants exercisable for a majority of the Warrant Shares, amend in any way, by supplemental agreement or otherwise, this Agreement and/or all of the outstanding Warrant Certificates; provided, however, that no such amendment shall adversely affect any Warrant differently than it affects all other Warrants, unless the Holder thereof consents thereto. The Warrant Agent shall, at the request of the Company, and without need of independent inquiry as to whether such supplemental agreement is permitted by the terms of this Section 16(b), join with the Company in the execution and delivery of any such supplemental agreements, but shall not be required to join in such execution and delivery for such supplemental agreement to become effective.

(c) Choice of Law, etc. All questions concerning the construction, validity, enforcement and interpretation of this Agreement shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party hereto 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. If either party shall commence an action or proceeding to enforce any provisions of this Agreement, then the prevailing party in such action or proceeding shall be reimbursed by the other party for its attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such action or proceeding.

(d) Interpretation. The headings herein are for convenience only, do not constitute a part of this Agreement and shall not be deemed to limit or affect any of the provisions hereof.

(e) Severability. In case any one or more of the provisions of this Agreement shall be invalid or unenforceable in any respect, the validity and enforceability of the remaining terms and provisions of this Agreement shall not in any way be affected or

impaired thereby and the parties will attempt in good faith to agree upon a valid and enforceable provision which shall be a commercially reasonable substitute therefor, and upon so agreeing, shall incorporate such substitute provision in this Agreement.

(f) Execution. This Agreement may be executed in counterparts, all of which when taken together shall be considered one and the same agreement and shall become effective when counterparts have been signed by each party and delivered to each other party, it being understood that the parties need not sign the same counterpart. In the event that any signature is delivered by facsimile or electronic transmission or by e-mail delivery of a “.pdf” format data file, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or “.pdf” signature page were an original thereof.

(g) Additional Warrants. The Company may from time to time issue additional warrants (the “**Additional Warrants**”) under this Agreement, without requiring the consent of any Holder, with the same terms as the warrants initially issued hereunder.

[The remainder of this page has been left intentionally blank.]

15

IN WITNESS WHEREOF, the undersigned has caused this Agreement to be duly executed by its authorized officer as of the date first indicated above.

PROTAGENIC THERAPEUTICS, INC.

By: _____

Name: _____

Title: _____

[Company Signature Page to Warrant Agent Agreement]

IN WITNESS WHEREOF, the undersigned has caused this Agreement to be duly executed by its authorized officer as of the date first indicated above.

**AMERICAN STOCK TRANSFER & TRUST COMPANY,
LLC,**
as Warrant Agent

By: _____

Name: _____

Title: _____

[Warrant Agent Signature Page to Warrant Agent Agreement]

Exhibit A

[UNLESS THIS GLOBAL WARRANT CERTIFICATE IS PRESENTED BY AN AUTHORIZED REPRESENTATIVE OF THE DEPOSITORY TRUST COMPANY, A NEW YORK CORPORATION (“DTC”), TO THE COMPANY OR ITS AGENT FOR REGISTRATION OF TRANSFER, EXCHANGE OR PAYMENT, AND ANY CERTIFICATE ISSUED IS REGISTERED IN THE NAME OF CEDE & CO. OR SUCH OTHER NAME AS IS REQUESTED BY AN AUTHORIZED REPRESENTATIVE OF DTC (AND ANY PAYMENT IS MADE TO CEDE & CO., OR TO SUCH OTHER ENTITY AS IS REQUESTED BY AN AUTHORIZED REPRESENTATIVE OF DTC), ANY TRANSFER, PLEDGE OR OTHER USE HEREOF FOR VALUE OR OTHERWISE BY OR

TO ANY PERSON IS WRONGFUL INASMUCH AS THE REGISTERED OWNER HEREOF, CEDE& CO., HAS AN INTEREST HEREIN.

TRANSFERS OF THIS GLOBAL SECURITY SHALL BE LIMITED TO TRANSFERS IN WHOLE, BUT NOT IN PART, TO NOMINEES OF DTC OR TO A SUCCESSOR THEREOF OR SUCH SUCCESSOR'S NOMINEE AND TRANSFERS OF PORTIONS OF THIS GLOBAL SECURITY SHALL BE LIMITED TO TRANSFERS MADE IN ACCORDANCE WITH THE RESTRICTIONS SET FORTH IN THE WARRANT AGENT AGREEMENT.

ANY TRANSFER OF THE SECURITIES REPRESENTED BY THIS GLOBAL WARRANT CERTIFICATE IS SUBJECT TO THE CONDITIONS SPECIFIED IN THE WARRANT AGENT AGREEMENT (THE "WARRANT AGREEMENT") DATED AS OF APRIL [], 2021 BETWEEN PROTAGENIC THERAPEUTICS, INC. AND AMERICAN STOCK TRANSFER & TRUST COMPANY, LLC, SOLELY IN ITS CAPACITY AS WARRANT AGENT. BY ACCEPTING DELIVERY OF THE SECURITIES REPRESENTED BY THIS GLOBAL WARRANT CERTIFICATE, ANY TRANSFEREE SHALL BE DEEMED TO HAVE AGREED TO BE BOUND BY THE WARRANT AGREEMENT AS IF THE TRANSFEREE HAD EXECUTED AND DELIVERED THE WARRANT AGREEMENT.]

EXERCISABLE ON OR AFTER APRIL [], 2021
AND UNTIL 5:00 P.M. (NEW YORK TIME) ON THE EXPIRATION DATE

CUSIP:
No.

Warrants to Purchase [] Shares

Warrant Certificate

**WARRANTS TO PURCHASE COMMON STOCK OF
PROTAGENIC THERAPEUTICS, INC.**

This Warrant Certificate certifies that [], or registered assigns, is the registered holder of Warrants (the "**Warrants**") to acquire from Protagenic Therapeutics, Inc., a Delaware corporation (the "**Company**"), the aggregate number of fully paid and non-assessable shares of common stock of the Company, par value \$0.0001 per share (the "**Common Stock**"), specified above for consideration equal to the Exercise Price (as defined in the Warrant Agreement (as defined below)) per share of Common Stock. The Exercise Price and number of shares of Common Stock and/or type of securities or property issuable upon exercise of the Warrants are subject to adjustment upon the occurrence of certain events as set forth in the Warrant Agreement. The Warrants evidenced by this Warrant Certificate shall not be exercisable after and shall terminate and become void as of 5:00 P.M., New York time, on [], 2025 (the "**Expiration Date**").

The Warrants evidenced by this Warrant Certificate are part of a duly authorized issue of warrants expiring on the Expiration Date entitling the Holder hereof to receive shares of Common Stock, and is issued or to be issued pursuant to a Warrant Agent Agreement, dated April [], 2021 (the "**Warrant Agreement**"), duly executed and delivered by the Company and American Stock Transfer & Trust Company, LLC, as warrant agent (the "**Warrant Agent**," which term includes any successor warrant agent under the Warrant Agreement), which Warrant Agreement is hereby incorporated by reference in and made a part of this instrument and is hereby referred to for a description of the rights, limitation of rights, obligations, duties and immunities thereunder of the Warrant Agent, the Company and the Holders ("**Holder**s" meaning, from time to time, the registered holders of the warrants issued thereunder). To the extent any provisions of this Warrant Certificate conflicts with any provision of the Warrant Agreement, the provisions of the Warrant Agreement shall apply. A copy of the Warrant Agreement may be obtained by the Holder hereof upon written request to the Company at Protagenic Therapeutics, Inc., Attn: Chief Financial Officer. Capitalized terms not defined herein have the meanings ascribed thereto in the Warrant Agreement.

The Warrants evidenced by this Warrant Certificate may be exercised, in whole or in part, at any time on or after April [], 2021 and on or before the Expiration Date, in the manner and subject to the terms of the Warrant Agreement including, but not limited to, Sections 4 and 8 thereof. Each exercise must be for a whole number of Warrant Shares.

The Warrant Agreement provides that upon the occurrence of certain events the Exercise Price set forth in this Warrant Certificate may, subject to certain conditions, be adjusted, and that upon the occurrence of certain events the number of shares of Common

Stock and/or the type of securities or other property issuable upon the exercise of the Warrants evidenced by this Warrant Certificate shall be adjusted. The Warrant Agreement also provides for the automatic conversion of the Warrants under certain circumstances. No fractional share of Common Stock will be issued upon the exercise of the Warrants evidenced by this Warrant Certificate, but the Company will at its election either pay the cash value thereof determined as provided in the Warrant Agreement or round the fractional share to the next whole share.

Warrant Certificates, when surrendered at the office of the Warrant Agent by the registered Holder thereof in person or by such Holder's legal representative or attorney duly appointed and authorized in writing, may be exchanged, in the manner and subject to the limitations provided in the Warrant Agreement, but without payment of any service charge, for another Warrant Certificate or Warrant Certificates of like tenor evidencing in the aggregate the right to purchase a like number of Warrant Shares.

Each taker and holder of this Warrant Certificate, by taking or holding the same, consents and agrees that the holder of this Warrant Certificate when duly endorsed in blank may be treated by the Company, the Warrant Agent and all other persons dealing with this Warrant Certificate as the absolute owner hereof for any purpose and as the person entitled to exercise the rights represented hereby or the person entitled to the transfer hereof on the register of the Company maintained by the Warrant Agent, any notice to the contrary notwithstanding, provided that until such transfer on such register, the Company and the Warrant Agent may treat the registered Holder hereof as the owner for all purposes.

The Warrants evidenced by this Warrant Certificate do not entitle any Holder to any of the rights of a stockholder of the Company.

This Warrant Certificate and the Warrant Agreement are subject to amendment as provided in the Warrant Agreement.

This Warrant Certificate shall not be valid or obligatory for any purpose until it shall have been countersigned by the Warrant Agent.

[The remainder of this page has been left intentionally blank.]

IN WITNESS WHEREOF, the undersigned have caused this Global Warrant Certificate to be executed as of the date set forth below.

PROTAGENIC THERAPEUTICS, INC.

By: _____
Name:
Title:

Dated: _____

Countersigned:
AMERICAN STOCK TRANSFER & TRUST
COMPANY, LLC,
as Warrant Agent

By: _____
Name:
Title:

[Signature page to [Global] Warrant Certificate]

FORM OF ASSIGNMENT

[To be completed and signed only upon transfer of Warrant]

FOR VALUE RECEIVED, the undersigned hereby sells, assigns and transfers unto _____ the right represented by the within Warrant Certificate to purchase _____ shares of common stock of Protagenic Therapeutics, Inc. to which the within Warrant Certificate relates and appoints _____ attorney to transfer said right on the books of Protagenic Therapeutics, Inc. with full power of substitution in the premises.

Dated: _____

Printed Name of Holder

Signature of Holder (signature must conform in all respects to name of holder as specified on the front page of the Warrant Certificate)

Title of Signatory (if Holder is not a natural person)

Address of Transferee:

Signature Guaranteed By:

The signature to this Form of Assignment must correspond with the name as it appears on the face of the Warrant Certificate in every particular. Officers signing on behalf of a corporation, partnership, trust or other entity must provide evidence of authority to assign the foregoing Warrant upon request of the Company or Warrant Agent. The signature must be guaranteed by a U.S. chartered bank or by a medallion signature guarantee from a member of a recognized Signature Medallion Guarantee Program.

FORM OF ELECTION TO PURCHASE

To Protagenic Therapeutics, Inc.:

In accordance with [Warrant Certificate No. enclosed with this Form of Election to Purchase][the Global Warrant Certificate to be delivered in connection with this Form of Election to Purchase in the manner contemplated by the Warrant Agreement (as defined below)], the undersigned hereby irrevocably elects to exercise the Warrants evidenced by this Warrant Certificate with respect to Warrant Shares in accordance with the terms of the Warrant Agent Agreement dated April [], 2021, between Protagenic Therapeutics, Inc., a Delaware corporation, and American Stock Transfer & Trust Company, LLC, as warrant agent (the “Warrant Agreement”). Terms used and not defined herein have the meanings specified in the Warrant Agreement.

The Holder hereby agrees to pay the Aggregate Exercise Price, in lawful money of the United States, by certified check payable to the Warrant Agent, as agent for the Company, or bank draft payable to the order of the Company or by wire transfer of immediately available funds to an account designated in writing by the Company (or as otherwise agreed to by the Company) delivered to the Warrant Agent, together with any applicable taxes payable by the undersigned pursuant to the terms of the Warrant Agreement.

Unless the Warrant Shares will be delivered electronically via DWAC, the undersigned requests that certificates for the shares of Common Stock issuable upon this exercise be issued in the name of:

Name: _____

Address: _____

Social Security or Tax I.D. No.: _____

If the Warrant Shares will be delivered electronically via DWAC, the undersigned requests that the Warrant Shares issuable upon this exercise be issued to the following account:

Name of DTC Participant: _____

DTC Participant Number: _____

Name of Account at DTC Participant to be credited with the Warrant Shares: _____

Account Number at DTC Participant to be credited with the Warrant Shares: _____

This Election to Purchase is delivered by:

Signature (and title, if applicable) of Authorized Signatory of Holder

Name of Holder

Date

Warrant Shares Exercise Log

Date	Number of Warrant Shares Available to be Exercised	Number of Warrant Shares Exercised	Number of Warrant Shares Remaining to be Exercised

**Charter of the Clinical and Regulatory Committee of the
Board of Directors of Protagenic Therapeutics, Inc. (the “Company”)**

Purpose

The purpose of the Clinical and Regulatory Committee (the “Committee”) shall be to provide advice, understanding and guidance both to management of the Company and to the Board of Directors on matters involving (i) the Company’s clinical testing plans and trials, (ii) interactions with clinical regulatory bodies, especially the U.S. Food and Drug Administration (FDA), and (iii) relationships with clinical investigators and clinical research organizations.

Committee Membership and Meetings

The Committee shall consist of two or more members of the Board of Directors. The Board of Directors, upon the recommendation of the Corporate Governance and Nominating Committee, shall appoint the members of the Committee. At least one member of the Committee shall meet the independence requirements of the Nasdaq Stock Market. Members of the Committee shall serve at the pleasure of the Board of Directors and for such term or terms as the Board of Directors may determine. Management of the Company shall also designate one member of management who will be the regular liaison between the Committee and management, and the Committee shall also have access to other members of management and key employees as necessary to carry out its responsibilities hereunder.

The Committee shall meet at such times as it determines to be necessary or appropriate and at such times requested by the Board of Directors and shall report at the next Board of Directors meeting following each such Committee meeting. The Committee may engage external consultants, as required, to provide supplemental expertise to facilitate their performance of their duties, and to determine compensation for such advisors. Any member of the Committee may call a meeting of the Committee upon due notice to each other member at least twenty-four hours prior to the meeting. Action may be taken by the Committee without a meeting if all of the members of the Committee indicate their approval thereof in writing or by electronic transmission.

Responsibilities

The Committee shall assist the Board of Directors and management of the Company in assessing the progress and performance of the Company’s clinical testing plans and trials, its interactions with clinical regulatory bodies, especially the U.S. Food and Drug Administration (FDA), and its relationships with clinical investigators and clinical research organizations. The role of the Committee will be to leverage the experience and expertise of the Board of Directors to assist management in a dedicated and more intensive manner than can be accomplished through regular board meetings. In particular, the Committee shall:

1. Assist management with clinical trial protocol development regarding pharmaceutical product targets in the Company’s pipeline.
2. Assist management to identify issues or challenges in a particular regulatory strategy, for the benefit to the Company.
3. Provide guidance to management to evaluate the merits and risks associated with any clinical trial design proposed by a third-party clinical research organization (CRO).
4. Review and evaluate interim data and final outcomes generated by clinical trials.
5. Review and advise on the appropriate structure for agreements with CROs with relation to testing of the company’s pharmaceutical assets.
6. Review with management periodically the Company’s clinical trial timelines and progress, and provide the Board with advice regarding same.
7. Provide guidance to the Board of Directors in its review, consideration and oversight of any Company-sponsored clinical trials recommended by management.

Other

The Committee shall:

- Periodically review and assess the adequacy of this charter and submit any changes to the Board for approval;
- Periodically perform an evaluation of the performance of the Committee and report to the Board on the results of such evaluation; and
- Review such other matters as the Board or the Committee shall deem appropriate.

The Committee shall undertake such additional activities within the scope of its primary functions as the Committee may from time to time determine. Unless the same shall be expressly delegated to the Committee from time to time by the Board of Directors, including under this charter, the Committee shall not have the authority to approve or authorize any matters that would otherwise be the responsibility of the Board of Directors.

Adopted September 1, 2020
