

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

Amendment No. 1  
to  
FORM S-3  
REGISTRATION STATEMENT  
UNDER THE SECURITIES ACT OF 1933

**HEAT BIOLOGICS, INC.**

*(Exact Name of Registrant as Specified in Its Charter)*

**Delaware**  
*(State or Other Jurisdiction of  
Incorporation or Organization)*

**26-2844103**  
*(I.R.S. Employer  
Identification Number)*

**627 Davis Drive, Suite 400  
Morrisville, North Carolina 27560  
(919) 240-7133**

*(Address, Including Zip Code, and Telephone Number, Including Area Code, of Registrant's Principal Executive Offices)*

**Jeffrey Wolf  
Chief Executive Officer and President  
Heat Biologics, Inc.  
627 Davis Drive, Suite 400  
Morrisville, North Carolina 27560  
(919) 240-7133**

*(Name, Address, Including Zip Code, and Telephone Number, Including Area Code of Agent for Service)*

***With copies to:***

**Leslie Marlow, Esq.  
Hank Gracin, Esq.  
Patrick J. Egan, Esq.  
Gracin & Marlow, LLP  
The Chrysler Building  
405 Lexington Avenue, 26th Floor  
New York, New York 10174  
(212) 907-6457**

**Approximate date of commencement of proposed sale to the public:** From time to time after the effective date of this registration statement.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box ☐

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, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box. ☒

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 registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box. ☐

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 413(b) under the Securities Act, check the following box. ☐

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

Large accelerated filer ☐  
Non-accelerated filer ☒

Accelerated filer ☐  
Smaller reporting company ☒  
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 to Section 7(a)(2)(B) of the Securities Act. ☐

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**The Registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment that specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until this registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.**

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## EXPLANATORY NOTE

Heat Biologics, Inc. (the “Registrant”) is filing this Pre-Effective Amendment No. 1 (the “Amendment No. 1”) to its Registration Statement on Form S-3 (File No. 333-251255) as an exhibit-only filing to file Exhibit 5.1 and restate the list of exhibits set forth in Item 16 of Part II of the Registration Statement. Accordingly, this Amendment No. 1 consists only of the facing page, this explanatory note, Part II of the Registration Statement, including the signature page and the exhibit index, and the filed exhibit. The prospectus is unchanged and has been omitted.

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**PART II**  
**INFORMATION NOT REQUIRED IN PROSPECTUS**

**Item 14. Other Expenses of Issuance and Distribution.**

The following sets forth the estimated costs and expenses, all of which shall be borne by the Registrant, in connection with the offering of the securities pursuant to this Registration Statement:

	<b>Amount</b>
SEC registration fee	\$ 22,240
FINRA filing fee	—
Printing and engraving expenses	(1)
Legal fees and expenses	(1)
Accountant's fees and expenses	(1)
Transfer agent and registrar fees and expenses	(1)
Miscellaneous	(1)
<b>Total</b>	<b>\$ (1)</b>

(1) These fees are calculated based on the securities offered and the number of issuances and, accordingly, cannot be estimated at this time.

**Item 15. Indemnification of Directors and Officers.**

Subsection (a) of Section 145 of the General Corporation Law of the State of Delaware, or the DGCL, empowers a corporation to indemnify any person who was or is a party or who is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation) by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe the person's conduct was unlawful.

Subsection (b) of Section 145 empowers a corporation to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that the person acted in any of the capacities set forth above, against expenses (including attorneys' fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, except that no indemnification shall be made in respect of any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Section 145 further provides that to the extent a director or officer of a corporation has been successful on the merits or otherwise in the defense of any action, suit or proceeding referred to in subsections (a) and (b) of Section 145, or in defense of any claim, issue or matter therein, such person shall be indemnified against expenses (including attorneys' fees) actually and reasonably incurred by such person in connection therewith; that indemnification provided for by Section 145 shall not be deemed exclusive of any other rights to which the indemnified party may be entitled; and the indemnification provided for by Section 145 shall, unless otherwise provided when authorized or ratified, continue as to a person who has ceased to be a director, officer, employee or agent and shall inure to the benefit of such person's heirs, executors and administrators. Section 145 also empowers the corporation to purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against such person and incurred by such person in any such capacity, or arising out of his status as such, whether or not the corporation would have the power to indemnify such person against such liabilities under Section 145.

Section 102(b)(7) of the DGCL provides that a corporation's certificate of incorporation may contain a provision eliminating or limiting the personal liability of a director to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, provided that such provision shall not eliminate or limit the liability of a director (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the DGCL, or (iv) for any transaction from which the director derived an improper personal benefit.

Our certificate of incorporation and our bylaws provide that we will indemnify our directors and officers to the fullest extent permitted by the Delaware General Corporation Law, which prohibits our certificate of incorporation from limiting the liability of our directors for the following:

- any breach of the director's duty of loyalty to us or our stockholders;
- acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law;
- unlawful payment of dividends or unlawful stock repurchases or redemptions; or
- any transaction from which the director derived an improper benefit.

Our third amended and restated certificate of incorporation provides for indemnification of our directors and executive officers to the maximum extent permitted by the Delaware General Corporation Law, and our amended and restated bylaws provide for indemnification of our directors and executive officers to the maximum extent permitted by the Delaware General Corporation Law.

We have entered into indemnification agreements with each of our current directors. These agreements will require us to indemnify these individuals to the fullest extent permitted under Delaware law against liabilities that may arise by reason of their service to us and to advance expenses incurred as a result of any proceeding against them as to which they could be indemnified. We also intend to enter into indemnification agreements with our future directors and executive officers.

In any underwriting agreement we enter into in connection with the sale of common stock being registered hereby, the underwriters will agree to indemnify, under certain conditions, us, our directors, our officers and persons who control us, within the meaning of the Securities Act, against certain liabilities.

In any at the market offering sales agreement, controlled equity offering sales agreement, or similar agreement that we enter into in connection with the sale of common stock being registered hereby, the sales agent or sales agents will agree to indemnify, under certain conditions, us, our directors, our officers and persons who control us, within the meaning of the Securities Act, against certain liabilities.

**Item 16. Exhibits.**

Exhibits filed with this Registration Statement on Form S-3 or incorporated by reference from other filings are as follows:

1.1	<a href="#"><u>Amended and Restated At Market Issuance Sales Agreement, dated August 24, 2020, by and among Heat Biologics, Inc., B. Riley Securities, Inc. and Cantor Fitzgerald &amp; Co. (Incorporated by reference to Exhibit 1.1 of the Current Report on Form 8-K (File No. 001-35994) filed with the Securities and Exchange Commission on August 24, 2020)</u></a>
1.2**	<a href="#"><u>Amendment No. 1, dated December 10, 2020, to the Amended and Restated At Market Issuance Sales Agreement, dated August 24, 2020, by and among Heat Biologics, Inc., B. Riley Securities, Inc. and Cantor Fitzgerald &amp; Co.</u></a>
1.3#	Form of Underwriting Agreement
3.1	<a href="#"><u>Third Amended and Restated Certificate of Incorporation (Incorporated by reference to Exhibit 3.5 of the Registrant's Form S-1 (File No. 333-188365) filed with the Securities and Exchange Commission on May 6, 2013)</u></a>
3.2	<a href="#"><u>Certificate of Amendment to the Third Amended and Restated Certificate of Incorporation (Incorporated by reference to Exhibit 3.6 to the Registrant's Registration Statement on Form S 1 filed with the Securities and Exchange Commission on May 30, 2013 (File No. 333 188365))</u></a>
3.3	<a href="#"><u>Certificate of Amendment to the Third Amended and Restated Certificate of Incorporation (Incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on July 17, 2017 (File No. 001-35994))</u></a>
3.4	<a href="#"><u>Certificate of Amendment to the Third Amended and Restated Certificate of Incorporation (Incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on January 19, 2018 (File No. 001-35994))</u></a>

3.5	<a href="#">Certificate of Amendment to the Third Amended and Restated Certificate of Incorporation (Incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on March 23, 2020 (File No. 001-35994))</a>
3.6	<a href="#">Amended and Restated Bylaws of Heat Biologics, Inc., dated October 17, 2019 (Incorporated by reference to Exhibit 31 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on October 18, 2019 (File No. 001-35994))</a>
4.1	<a href="#">Specimen stock certificate evidencing the shares of common stock (Incorporated by reference to Exhibit 4.8 of the Registrant's Form S-1 (File No. 333-188365) filed with the Securities and Exchange Commission on May 6, 2013)</a>
4.2#	Form of Preferred Stock Certificate
4.3#	Certificate of Designation, Preferences and Rights of Preferred Stock
4.4#	Form of Warrant
4.5#	Form of Warrant Agreement
4.6#	Form of Unit
4.7#	Form of Unit Agreement
5.1*	<a href="#">Legal opinion of Gracin &amp; Marlow, LLP</a>
23.1**	<a href="#">Consent of BDO USA, LLP, Independent Registered Public Accounting Firm</a>
23.2*	<a href="#">Consent of Gracin &amp; Marlow, LLP (included in Exhibit 5.1)</a>
24.1**	<a href="#">Powers of Attorney for our directors (included on signature page of the initial filing)</a>

\* Filed herewith.

\*\* Previously filed.

# To be filed by amendment pursuant to a report to be filed pursuant to Section 13 or 15(d) of the Exchange Act, if applicable, and incorporated herein by reference.

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;
- (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 increase 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 SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and
- (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;

*provided, however*, that the undertakings set forth in paragraphs (1)(i), (1)(ii) and (1)(iii) above do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the SEC by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, that are incorporated by reference in this registration statement or are contained in a form of prospectus filed pursuant to Rule 424(b) that is part of this registration statement.

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

- (i) 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
- (ii) 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 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.

(5) That, for the purpose of determining liability of the registrant under the Securities Act 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) That, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in the registration statement 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.

Insofar as indemnification for liabilities arising under the Securities Act 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 SEC such indemnification is against public policy as expressed in the Securities 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 whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

## SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this Amendment No. 1 to the Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Morrisville, State of North Carolina, December 18, 2020.

### HEAT BIOLOGICS, INC.

By: /s/ Jeffrey Wolf  
Chief Executive Officer,  
President and Director  
(Principal Executive Officer)

Pursuant to the requirements of the Securities Act of 1933, as amended, this Amendment No. 1 to the Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

<b>Signature</b>	<b>Title</b>	<b>Date</b>
<u>/s/ Jeffrey Wolf</u> Jeffrey Wolf	Chief Executive Officer, President and Chairman (Principal Executive Officer)	December 18, 2020
<u>/s/ William Ostrander</u> William Ostrander	Vice President of Finance (Principal Financial Officer and Principal Accounting Officer)	December 18, 2020
<u>*</u> John Prendergast, Ph.D.	Lead Director	December 18, 2020
<u>*</u> John Monahan, Ph.D.	Director	December 18, 2020
<u>*</u> Edward B. Smith, III	Director	December 18, 2020
<u>*By: /s/ Jeffrey Wolf</u> Jeffrey Wolf Attorney-in-fact		





The Chrysler Building  
405 Lexington Avenue, 26<sup>th</sup> Floor  
New York, New York 10174  
Telephone: (212) 907-6457  
Facsimile: (212) 208-4657

December 18, 2020

The Board of Directors  
Heat Biologics, Inc.  
801 Capitola Drive  
Durham, North Carolina 27713

**Re: Registration Statement on Form S-3**

Ladies and Gentlemen:

This opinion is furnished to you in connection with the filing of a Registration Statement on Form S-3, as amended (File No. 333-251255) (the "**Registration Statement**"), on the date hereof by Heat Biologics, Inc., a Delaware corporation (the "**Company**"), with the Securities and Exchange Commission (the "**Commission**") under the Securities Act of 1933, as amended (the "**Securities Act**"), for the registration by the Company of up to \$250,000,000 of any combination of the following securities of the Company:

- shares of common stock, par value \$0.0002 per share, of the Company (the "**Common Stock**");
- shares of preferred stock, par value \$0.0001 per share, of the Company (the "**Preferred Stock**");
- warrants to purchase Common Stock or Preferred Stock (the "**Warrants**"), which may be issued under one or more warrant agreements, to be dated on or about the date of the first issuance of the Warrants thereunder, by and between a warrant agent (if any) to be selected by the Company (the "**Warrant Agent**") and the Company, respectively (each, a "**Warrant Agreement**"); and
- units representing an interest in two or more securities, which may be or may not be separable from one another (the "**Units**") that may be issued under one or more unit agreements, to be dated on or about the date of the first issuance of the Units thereunder, by and between a bank or trust company, as unit agent to be selected by the Company (the "**Unit Agent**") and the Company, in the forms to be filed as an exhibit to the Registration Statement, respectively (each, a "**Unit Agreement**").

The Common Stock, the Preferred Stock, the Warrants and the Units, plus any additional Common Stock, Preferred Stock, Warrants and Units that may be registered pursuant to any registration statement that the Company may hereafter file with the Commission pursuant to Rule 462(b) under the Securities Act in connection with an offering by the Company pursuant to the Registration Statement, are collectively referred to herein as the "**Securities**." The Securities are being registered for offer and sale from time to time pursuant to Rule 415 under the Securities Act.

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The Registration Statement also relates to the Common Stock purchase rights (the “**Rights**”) issuable in accordance with the rights agreement, dated as of March 11, 2018, between the Company and Continental Stock Transfer & Trust Company, as Rights Agent, as amended by Amendment No. 1 to the Rights Agreement, dated March 8, 2019, and Amendment No. 2 to the Rights Agreement, dated March 10, 2020 (the “**Rights Agreement**”), which Rights are presently attached to the Common Stock.

We are acting as counsel for the Company in connection with the Registration Statement and the issuance and sale of the Securities thereunder. We are also acting as counsel for the Company in connection with the Amended and Restated At Market Issuance Sales Agreement prospectus included in the Registration Statement (the “**Sales Agreement ATM Prospectus**”) relating to the issuance and sale of shares of Common Stock having an aggregate offering price of up to \$150,000,000 (the “**Sales Agreement Shares**”) under the Amended and Restated At Market Issuance Sales Agreement, dated August 24, 2020, as amended by Amendment No. 1 thereto, dated December 10, 2020, by and among the Company, B. Riley Securities, Inc. and Cantor Fitzgerald & Co., as the sales agents (the “**Sales Agreement**”).

In connection with this opinion, we have examined and relied upon originals, or copies certified to our satisfaction, of such records, documents, certificates, opinions, memoranda and other instruments as in our judgment are necessary or appropriate to enable us to render the opinion expressed below, including, but not limited to, signed copies of the Registration Statement to be filed with the Commission, including the exhibits thereto, the Sales Agreement, the Third Amended and Restated Certificate of Incorporation of the Company (as amended or restated from time to time, the “**Certificate of Incorporation**”), the Amended and Restated Bylaws of the Company (as amended or restated from time to time, the “**Bylaws**”) and resolutions of the Board of Directors of the Company provided to us by the Company. As to certain factual matters, we have relied upon a certificate of an officer of the Company and have not independently verified such matters.

In rendering this opinion, we have assumed the genuineness and authenticity of all signatures on original documents; the authenticity of all documents submitted to us as originals; the conformity to originals of all documents submitted to us as copies; the accuracy, completeness and authenticity of certificates of public officials; and the due authorization, execution and delivery of all documents where authorization, execution and delivery are prerequisites to the effectiveness of such documents.

With respect to our opinion as to the Common Stock (including the Sales Agreement Shares), we have assumed that, at the time of issuance and sale of any of the shares of Common Stock, a sufficient number of shares of Common Stock will be authorized and available for issuance and that the consideration for the issuance and sale of the shares of Common Stock (or Preferred Stock convertible into, or Warrants exercisable for, Common Stock, or Common Stock included in a Unit) is in an amount that is not less than the par value of the Common Stock. In addition, we have also assumed that the Company will comply with all applicable notice requirements regarding uncertificated shares provided in the Delaware General Corporation Law (the “**DGCL**”). With respect to our opinion as to the Preferred Stock, we have assumed that, at the time of issuance and sale, a sufficient number of shares of Preferred Stock is authorized, designated and available for issuance and that the consideration for the issuance and sale of the Preferred Stock (or Warrants exercisable for Preferred Stock, or Preferred Stock included in a Unit) is in an amount that is not less than the par value of the Preferred Stock. We have also assumed that any Warrants or Units offered under the Registration Statement, and the related Warrant Agreement and Unit Agreement, respectively, will be executed in the forms filed as exhibits to the Registration Statement or incorporated by reference therein.

We have also assumed that (i) with respect to Securities issuable upon conversion of any convertible Preferred Stock, such convertible Preferred Stock will be duly authorized, validly issued, fully paid and non-assessable; and (ii) with respect to any Securities issuable upon exercise of any Warrants or as part of a Unit, such Warrants or Units will constitute valid and legally binding obligations of the Company, enforceable against the Company in accordance with their terms, except as enforcement may be limited by applicable bankruptcy, insolvency, reorganization, arrangement, moratorium or other similar laws affecting creditors’ rights, and subject to general equity principles and to limitations on availability of equitable relief, including specific performance. We have also assumed that any Units issued by the Company pursuant to the Registration Statement, the Prospectus and the related Prospectus Supplement may be issued pursuant to a valid, binding, and enforceable Unit Agreement between the Company and a bank or trust company as the Unit Agent. We have also assumed that any Warrant Agreement and Unit Agreement will be governed by and construed in accordance with the laws of the State of New York.

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With respect to the Sales Agreement Shares, we have assumed (i) that the specific sale of the Sales Agreement Shares will be duly authorized by the Board of Directors of the Company, a duly authorized committee thereof or a person or body pursuant to an authorization granted in accordance with Section 152 of the DGCL and (ii) that the Sales Agreement Shares will be issued for a price per share equal to or greater than the minimum price authorized by the Board of Directors of the Company or a duly authorized committee thereof or a person or body pursuant to an authorization granted prior to the date hereof (the “*Minimum Price*”) and that no event occurs that causes the number of authorized shares of Common Stock available for issuance by the Company to be less than the number of then unissued shares of Common Stock that may be issued for the Minimum Price. With respect to the Sales Agreement Shares, we express no opinion to the extent that future issuances of securities of the Company and/or anti-dilution adjustments to outstanding securities of the Company cause the number of shares of Common Stock authorized less the sum of the number of shares outstanding or committed to be issued to exceed the number of Sales Agreement Shares then issuable under the Sales Agreement.

On the basis of the foregoing and in reliance thereon, and subject to the qualifications herein stated, we are of the opinion that:

1. With respect to the shares of Common Stock offered under the Registration Statement (other than the Sales Agreement Shares), provided that (i) the Registration Statement and any required post-effective amendment thereto have become effective under the Securities Act and the Base Prospectus and any and all Prospectus Supplement(s) required by applicable laws have been delivered and filed as required by such laws; (ii) the issuance of the Common Stock has been duly authorized by all necessary corporate action on the part of the Company; (iii) the issuance and sale of the shares of Common Stock do not violate any applicable law, are in conformity with the Company’s then operative Certificate of Incorporation and Bylaws, do not result in a default under or breach of any agreement or instrument binding upon the Company and comply with any applicable requirement or restriction imposed by any court or governmental body having jurisdiction over the Company; and (iv) the certificates, if any, for the Common Stock have been duly executed by the Company, countersigned by the transfer agent therefor and duly delivered to the purchasers thereof against payment therefor, then the Common Stock, when issued and sold as contemplated in the Registration Statement, the Base Prospectus and the related Prospectus Supplement(s), and in accordance with a duly authorized, executed and delivered purchase, underwriting or similar agreement, or upon conversion of any convertible Preferred Stock in accordance with their terms, or upon exercise of any Warrants in accordance with their terms, will be validly issued, fully paid and non-assessable.
  2. With respect to the Preferred Stock offered under the Registration Statement, provided that (i) the Registration Statement and any required post-effective amendment thereto have become effective under the Securities Act and the Base Prospectus and any and all Prospectus Supplement(s) required by applicable laws have been delivered and filed as required by such laws; (ii) the terms and issuance of the Preferred Stock have been duly authorized by all necessary corporate action on the part of the Company; (iii) the terms of the shares of Preferred Stock and their issuance and sale do not violate any applicable law, are in conformity with the Certificate of Incorporation and Bylaws, do not result in a default under or breach of any agreement or instrument binding upon the Company and comply with any applicable requirement or restriction imposed by any court or governmental body having jurisdiction over the Company; and (iv) the certificates, if any, for the Preferred Stock have been duly executed by the Company, countersigned by the transfer agent therefor and duly delivered to the purchasers thereof against payment therefor, then the Preferred Stock, when issued and sold as contemplated in the Registration Statement, the Base Prospectus and the related Prospectus Supplement(s) and in accordance with a duly authorized, executed and delivered purchase, underwriting or similar agreement, or upon exercise of any Warrants in accordance with their terms, will be validly issued, fully paid and non-assessable.
  3. With respect to the Warrants issued under the Warrant Agreements and offered under the Registration Statement, provided that (i) the Registration Statement and any required post-effective amendment thereto have become effective under the Securities Act and the Base Prospectus and any and all Prospectus Supplement(s) required by applicable laws have been delivered and filed as required by such laws; (ii) the Warrant Agreement has been duly authorized by the Company and the Warrant Agent by all necessary corporate action; (iii) the Warrant Agreement has been duly executed and delivered by the Company and the Warrant Agent; (iv) the issuance and terms of the Warrants have been duly authorized by the Company
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by all necessary corporate action; (v) the terms of the Warrants and of their issuance and sale have been duly established in conformity with the Warrant Agreement and as described in the Registration Statement, the Base Prospectus and the related Prospectus Supplement(s), so as not to violate any applicable law or result in a default under or breach of any agreement or instrument binding upon the Company, so as to be in conformity with the Certificate of Incorporation and Bylaws, and so as to comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company; and (vi) the Warrants have been duly executed and delivered by the Company and authenticated by the Warrant Agent pursuant to the Warrant Agreement and delivered against payment therefor, then the Warrants, when issued and sold as contemplated in the Registration Statement, the Base Prospectus and the Prospectus Supplement(s) and in accordance with the Warrant Agreement and a duly authorized, executed and delivered purchase, underwriting or similar agreement, will be valid and legally binding obligations of the Company, enforceable against the Company in accordance with their terms, except as enforcement thereof may be limited by bankruptcy, insolvency, reorganization, moratorium or other similar laws relating to or affecting creditors' rights generally, and by general equitable principles (regardless of whether such enforceability is considered in a proceeding at law or in equity).

4. With respect to the Units issued under the Unit Agreements and offered under the Registration Statement, when the Unit Agreement to be entered into in connection with the issuance of any Units has been duly authorized, executed and delivered by the Unit Agent and the Company; the specific terms of the Units have been duly authorized and established in accordance with the Unit Agreement; and such Units have been duly authorized, executed, issued and delivered in accordance with the Unit Agreement and the applicable underwriting or other agreement against payment therefor, such Units will constitute valid and legally binding obligations of the Company, enforceable against the Company in accordance with their terms, except as enforcement thereof may be limited by bankruptcy, insolvency, reorganization, moratorium or other similar laws relating to or affecting creditors' rights generally, and by general equitable principles (regardless of whether such enforceability is considered in a proceeding at law or in equity).
5. With respect to the Sales Agreement Shares, such Sales Agreement Shares have been duly authorized for issuance and, when (i) the Registration Statement has become effective under the Securities Act and (ii) the Sales Agreement Shares have been issued and paid for in accordance with the terms and conditions of the Sales Agreement, the Sales Agreement Shares will be validly issued, fully paid and nonassessable.
6. With respect to each of the Rights attached to shares of Common Stock, each of such Rights when issued in accordance with and in the manner described in the Registration Statement and the Rights Agreement, will constitute a valid and binding obligation of the Company.

Our opinions herein are expressed solely with respect to the DGCL, and, as to the Warrants and Units constituting valid and legally binding obligations of the Company, the laws of the State of New York. Our opinion is based on these laws as in effect on the date hereof. We express no opinion to the extent that any other laws are applicable to the subject matter hereof and express no opinion and provide no assurance as to compliance with any federal or state securities law, rule or regulation.

We hereby consent to the filing of this opinion with the Commission as an exhibit to the Registration Statement in accordance with the requirements of Item 601(b)(5) of Regulation S-K under the Securities Act and to the use of our name therein and in the related Prospectus and the Sales Agreement ATM Prospectus under the caption "Legal Matters." We further consent to the incorporation by reference of this opinion into any registration statement filed pursuant to Rule 462(b) under the Securities Act with respect to additional Securities. In giving such consent, we do not hereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission.

Very truly yours,

/s/ Gracin & Marlow, LLP