
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

Moleculin Biotech, Inc.

(Exact name of registrant as specified in its Charter)

Delaware
(State or other jurisdiction
of incorporation)

47-4671997
(I.R.S. Employer
Identification No.)

**2575 West Bellfort, Suite 333
Houston, TX 77054
713-300-5160**

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

**Walter V. Klemp
Chief Executive Officer
2575 West Bellfort, Suite 333
Houston, TX 77054
713-300-5160**

(Name, address, including zip code, and telephone number, including area code, of agent for service of process)

Copies to:

**Cavas S. Pavri
Schiff Hardin LLP
100 N. 18th Street, Suite 300
Philadelphia, PA 19103
Telephone: (202) 724-6847
Facsimile: (202) 778-6460**

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, as amended, other than securities offered only in connection with dividend or interest reinvestment plans, please 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, as amended, 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, as amended, 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 1.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 post-effective amendment to a registration statement filed pursuant to General Instruction 1.D. filed to register additional securities or additional classes of securities 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

Accelerated filer

Non-accelerated filer

Smaller reporting company

(Do not check if a 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 pursuant to Section 7(a)(2)(B) of Securities Act.

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 which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

The information in this prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated August 11, 2017

PROSPECTUS

\$75,000,000

Moleculin Biotech, Inc.

**Common Stock
Preferred Stock
Debt Securities
Warrants
Units**

We may from time to time issue up to \$75,000,000 aggregate dollar amount of common stock, preferred stock, debt securities, warrants or units of securities. We will specify in the accompanying prospectus supplement the terms of the securities to be offered and sold. We may sell these securities directly to you, through underwriters, dealers or agents we select, or through a combination of these methods. We will describe the plan of distribution for any particular offering of these securities in the applicable prospectus supplement. This prospectus may not be used to sell our securities unless it is accompanied by a prospectus supplement.

Our common stock is listed on The NASDAQ Capital Market and traded under the symbol "MBRX". On August 9, 2017, the closing price of the common stock, as reported on NASDAQ was \$2.87 per share.

As of August 1, 2017, the aggregate market value of our outstanding common stock held by non-affiliates was approximately \$35,633,714, based on 20,261,904 shares of outstanding common stock, of which approximately 13,148,972 shares are held by non-affiliates, and a per share price of \$2.71 based on the closing sales price of our common stock on August 1, 2017. As of the date hereof, we have not offered any securities pursuant to General Instruction I.B.6 of Form S-3 during the prior 12 calendar month period that ends on and includes the date hereof.

Investing in our securities is highly speculative and involves a high degree of risk. You should purchase these securities only if you can afford a complete loss of your investment. You should carefully consider the risks and uncertainties described under the heading "Risk Factors" beginning on page 3 of this prospectus before making a decision to purchase our securities.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus is _____, 2017.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, utilizing a “shelf” registration process. Under this shelf registration process, we may sell the securities described in this prospectus in one or more offerings up to a total dollar amount of \$75,000,000.

We have provided to you in this prospectus a general description of the securities we may offer. Each time we sell securities under this shelf registration process, we will provide a prospectus supplement that will contain specific information about the terms of that offering. That prospectus supplement may include additional risk factors or other special considerations applicable to the securities being offered. We may also add, update or change in the prospectus supplement any of the information contained in this prospectus. To the extent there is a conflict between the information contained in this prospectus and the prospectus supplement, you should rely on the information in the prospectus supplement, provided that if a statement in any document is inconsistent with a statement in another document having a later date — for example, a document incorporated by reference in this prospectus or any prospectus supplement — the statement in the document having the later date modifies or supersedes the earlier statement. You should read both this prospectus and the prospectus supplement together with the additional information described under “Where You Can Find More Information.”

The registration statement containing this prospectus, including the exhibits to the registration statement, provides additional information about us and the securities offered under this prospectus. The registration statement, including the exhibits, can be read at the SEC website or at the SEC offices mentioned under the heading “Where You Can Find More Information.”

You should rely only on the information incorporated by reference or provided in this prospectus and the accompanying prospectus supplement. We have not authorized anyone to provide you with different information. We are not making an offer to sell or soliciting an offer to buy these securities in any jurisdiction in which the offer or solicitation is not authorized or in which the person making the offer or solicitation is not qualified to do so or to anyone to whom it is unlawful to make the offer or solicitation. You should not assume that the information in this prospectus or the accompanying prospectus supplement is accurate as of any date other than the date on the front of the document.

Unless the context requires otherwise, references to the “Company,” “MBI,” “we,” “our,” and “us,” refer to Moleculin Biotech, Inc. and its subsidiaries.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities offered in this offering. We file annual, quarterly and current reports, proxy statements and other information with the Securities and Exchange Commission. You may read and copy the registration statement and any other documents we have filed at the Securities and Exchange Commission’s Public Reference Room 100 F Street, N.E., Washington, D.C. 20549. Please call the Securities and Exchange Commission at 1-800-SEC-0330 for further information on the Public Reference Room. Our Securities and Exchange Commission filings are also available to the public at the Securities and Exchange Commission’s Internet site at www.sec.gov.

This prospectus is part of the registration statement and does not contain all of the information included in the registration statement. Whenever a reference is made in this prospectus to any of our contracts or other documents, the reference may not be complete and, for a copy of the contract or document, you should refer to the exhibits that are a part of the registration statement.

INCORPORATION BY REFERENCE

The SEC allows us to “incorporate by reference” into this prospectus the information we file with it, which means that we can disclose important information to you by referring you to those documents. Later information filed with the SEC will update and supersede this information.

We incorporate by reference the documents listed below, all filings filed by us pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of the initial registration statement of which this prospectus forms a part prior to effectiveness of such registration statement, and any future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act prior to the time that all securities covered by this prospectus have been sold or the offering is otherwise terminated; provided, however, that we are not incorporating any information furnished under either Item 2.02 or Item 7.01 of any current report on Form 8-K:

- Our Annual Report on Form 10-K for the year ended December 31, 2016 filed on April 3, 2017.
- Our Quarterly Reports on Form 10-Q for the fiscal quarters ended March 31, 2017 and June 30, 2017.
- Our Definitive Proxy Statement on Schedule 14A filed on April 28, 2017.
- Our Current Reports on Form 8-K dated February 9, 2017; February 23, 2017; March 14, 2017; March 22, 2017; April 17, 2017; May 19, 2017; May 31, 2017; June 27, 2017; June 30, 2017; July 12, 2017; and July 27, 2017.
- The description of our common stock contained in our registration statement on Form 8-A filed on April 28, 2016, and any amendment or report filed for the purpose of updating that description.

An updated description of our capital stock is included in this prospectus under “Description of Common Stock” and “Description of Preferred Stock”.

We will provide to each person, including any beneficial owner, to whom this prospectus is delivered, upon written or oral request, at no cost to the requester, a copy of any and all of the information that is incorporated by reference in this prospectus. You may request a copy of these filings, at no cost, by contacting us at:

Moleculin Biotech, Inc.
Attn: Corporate Secretary
2575 West Bellfort, Suite 333
Houston, TX 77054
Phone: 713-300-5160

ABOUT MOLECULIN BIOTECH, INC.

Our Company

We are a preclinical-stage pharmaceutical company organized as a Delaware corporation in July 2015 to focus on the development of anti-cancer drug candidates, some of which are based on license agreements with The University of Texas System on behalf of the M.D. Anderson Cancer Center, which we refer to as MD Anderson. Our lead drug candidate is liposomal Annamycin, which we refer to as Annamycin, an anthracycline being studied for the treatment of relapsed or refractory acute myeloid leukemia, or AML. We have two other drug development projects in process, one involving a collection of small molecules, which we refer to as the WP1066 Portfolio, focused on the modulation of key regulatory transcription factors involved in the progression of cancer, and the WP1222 Portfolio, a suite of molecules targeting the metabolic processes involved in cancer in general and glioblastoma (the most common form of brain tumor) in particular. We also continue to sponsor ongoing research at MD Anderson in order to improve and expand our drug development pipeline.

We have been granted royalty-bearing, worldwide, exclusive licenses for the patent and technology rights related to our WP1066 Portfolio and WP1122 Portfolio drug technologies, as these patent rights are owned by MD Anderson. The Annamycin drug substance is no longer covered by any existing patent protection. We intend to submit patent applications for formulation, synthetic process and reconstitution related to our Annamycin drug product candidate, although there is no assurance that we will be successful in obtaining such patent protection. Independently from potential patent protection, we have received Orphan Drug designation from the FDA for Annamycin for the treatment of AML, which would entitle us to market exclusivity of 7 years from the date of approval of a New Drug Application (NDA) in the United States. If we submit and receive approval for a New Drug Application (NDA) for Annamycin for the treatment of AML, we may then benefit from Orphan Drug exclusivity, during which period FDA generally could not approve another Annamycin product for the same use. We also intend to apply for similar status in the European Union (EU) where market exclusivity extends to 10 years from the date of Marketing Authorization Application (MAA). Separately, the FDA may also grant market exclusivity of 5 years for newly approved new chemical entities (of which Annamycin would be one), but there can be no assurance that such exclusivity will be granted.

Corporate Information

Our corporate headquarters is located at 2575 West Bellfort, Suite 333, Houston, TX 77054. Our phone number is (713) 300-5160. Our corporate website is www.moleculin.com. Information contained on our website or any other website does not constitute part of this prospectus.

RISK FACTORS

Before making an investment decision, you should consider the “Risk Factors” included under Item 1A. of our Annual Report on Form 10-K for the period ended December 31, 2016 and in our updates to those Risk Factors in our Quarterly Reports on Form 10-Q, all of which are incorporated by reference in this prospectus, as updated by our future filings with the SEC. The market or trading price of our common stock could decline due to any of these risks. In addition, please read “Forward-Looking Statements” in this prospectus, where we describe additional uncertainties associated with our business and the forward-looking statements included or incorporated by reference in this prospectus. Please note that additional risks not currently known to us or that we currently deem immaterial may also impair our business and operations. The accompanying prospectus supplement may contain a discussion of additional risks applicable to an investment in us and the particular type of securities we are offering under that prospectus supplement.

FORWARD-LOOKING STATEMENTS

Some of the information in this prospectus, and the documents we incorporate by reference, contain forward-looking statements within the meaning of the federal securities laws. You should not rely on forward-looking statements in this prospectus, and the documents we incorporate by reference. Forward-looking statements typically are identified by use of terms such as “anticipate,” “believe,” “plan,” “expect,” “future,” “intend,” “may,” “will,” “should,” “estimate,” “predict,” “potential,” “continue,” and similar words, although some forward-looking statements are expressed differently. This prospectus, and the documents we incorporate by reference, may also contain forward-looking statements attributed to third parties relating to their estimates regarding the markets we may enter in the future. All forward-looking statements address matters that involve risk and uncertainties, and there are many important risks, uncertainties and other factors that could cause our actual results to differ materially from the forward-looking statements contained in this prospectus, and the documents we incorporate by reference.

You should also consider carefully the statements under “Risk Factors” and other sections of this prospectus, and the documents we incorporate by reference, which address additional facts that could cause our actual results to differ from those set forth in the forward-looking statements. We caution investors not to place significant reliance on the forward-looking statements contained in this prospectus, and the documents we incorporate by reference. We undertake no obligation to publicly update or review any forward-looking statements, whether as a result of new information, future developments or otherwise.

USE OF PROCEEDS

We expect to use the net proceeds from the sale of securities offered by this prospectus and the prospectus supplement for our clinical trials, if any, and preclinical programs, for other research and development activities and for general corporate purposes. These may include additions to working capital, repayment of existing indebtedness and acquisitions. If we decide to use the net proceeds of any offering of securities other than for our clinical trials, if any, and preclinical programs, for other research and development activities and for general corporate purposes, we will describe the use of the net proceeds in the prospectus supplement for that offering.

DESCRIPTION OF COMMON STOCK

General

We are currently authorized to issue 75,000,000 shares of common stock, par value \$0.001. As of August 1, 2017, we had 20,261,904 shares of our common stock outstanding.

Subject to preferences that may be applicable to any preferred stock outstanding at the time, the holders of our common stock are entitled to receive dividends out of legally available assets at such times and in such amounts as our Board of Directors may from time to time determine. Each stockholder is entitled to one vote for each share of common stock held on all matters submitted to a vote of stockholders. Cumulative voting is not allowed.

Our common stock is not subject to conversion or redemption and holders of our common stock are not entitled to preemptive rights. Upon the liquidation, dissolution or winding up of our company, the remaining assets legally available for distribution to stockholders, after payment of claims or creditors and payment of liquidation preferences, if any, on outstanding preferred stock, are distributable ratably among the holders of our common stock and any participating preferred stock outstanding at that time. Each outstanding share of common stock is fully paid and nonassessable.

Anti-Takeover Effects of Provisions of Delaware Law and our Charter Documents

Provisions of Delaware law and our Amended and Restated Certificate of Incorporation (“Certificate of Incorporation”) and our Amended and Restated Bylaws (“Bylaws”) could make the acquisition of our company through a tender offer, a proxy contest or other means more difficult and could make the removal of incumbent officers and directors more difficult. We expect these provisions to discourage coercive takeover practices and inadequate takeover bids and to encourage persons seeking to acquire control of our company to first negotiate with our Board of Directors. We believe that the benefits provided by our ability to negotiate with the proponent of an unfriendly or unsolicited proposal outweigh the disadvantages of discouraging these proposals. We believe the negotiation of an unfriendly or unsolicited proposal could result in an improvement of its terms.

Our Bylaws do not permit stockholders to call a special meeting of stockholders. Our Bylaws provide that special meetings of the stockholders may be called by the Chairman of the Board of Directors, our Chief Executive Officer, our President, the Board of Directors, or in their absence or disability, by any vice president. Our Bylaws require that all stockholder actions be taken by a vote of the stockholders at an annual or special meeting, and do not permit our stockholders to act by written consent without a meeting. Our Bylaws provide for an advance notice procedure for stockholder proposals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to the Board of Directors. At an annual meeting, stockholders may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the Board of Directors. The Bylaws do not give our Board of Directors the power to approve or disapprove stockholder nominations of candidates or proposals regarding other business to be conducted at a special or annual meeting of the stockholders. However, our Bylaws may have the effect of precluding the conduct of business at a meeting if the proper procedures are not followed. These provisions may also discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer’s own slate of directors or otherwise attempting to obtain control of our company.

Quotation

Our common stock is listed on The NASDAQ Capital Market and traded under the symbol “MBRX”.

Transfer Agent

The transfer agent for our common stock is VStock Transfer, LLC located at 18 Lafayette Place, Woodmere, New York 11598.

DESCRIPTION OF PREFERRED STOCK

General

We are currently authorized to issue 5,000,000 shares of preferred stock, par value \$0.001. As of the date of this prospectus, we have no shares of preferred stock outstanding.

Our Board of Directors has the authority, without action by our stockholders, to designate and issue preferred stock in one or more series. Our Board of Directors may also designate the rights, preferences and privileges of each series of preferred stock, any or all of which may be greater than the rights of the common stock. It is not possible to state the actual effect of the issuance of any shares of preferred stock on the rights of holders of the common stock until our Board of Directors determines the specific rights of the holders of the preferred stock. However, these effects might include: (a) restricting dividends on the common stock; (b) diluting the voting power of the common stock; (c) impairing the liquidation rights of the common stock; and (d) delaying or preventing a change in control of our company without further action by our stockholders.

DESCRIPTION OF DEBT SECURITIES

General

The following description sets forth general terms that will apply to the debt securities. We will describe the particular terms of any debt securities that we offer in the prospectus supplement relating to those debt securities.

The debt securities will be either our senior debt securities or our subordinated debt securities. The senior debt securities will be issued under an indenture between us and the trustee named in the indenture. We refer to this indenture as the “senior indenture.” The subordinated debt securities will be issued under a separate Subordinated Indenture between us and the trustee named in the indenture. We refer to this indenture as the “subordinated indenture” and, together with the senior indenture, as the “indentures.” Except as permitted by applicable law, the indentures have been or will be qualified under the Trust Indenture Act of 1939.

We have filed the forms of the indentures as exhibits to the registration statement. For your convenience, we have included references to specific sections of the indentures in the descriptions below. Capitalized terms not otherwise defined in this prospectus will have the meanings given in the indenture to which they relate.

The following summaries of provisions of the debt securities and the indentures are not complete and are qualified in their entirety by reference to the provisions of the indentures and the debt securities.

Neither of the indentures limits the principal amount of debt securities that we may issue. Each indenture provides that debt securities may be issued in one or more series up to the principal amount that we may authorize from time to time. Each indenture also provides that the debt securities may be denominated in any currency or currency unit that we designate. In addition, each series of debt securities may be reopened in order to issue additional debt securities of that series in the future without the consent of the holders of debt securities of that series. Unless otherwise described in the prospectus supplement relating to a particular offering, neither the indentures nor the debt securities will contain any provisions to afford holders of any debt securities protection in the event of a takeover, recapitalization or similar restructuring of our business.

Unless otherwise described in the prospectus supplement relating to a particular offering, the senior debt securities will rank equally with all of our other unsecured and unsubordinated debt. The subordinated debt securities will be subordinated to the prior payment in full of our senior debt securities. We will describe the particular terms of the subordinated debt securities that we offer in the prospectus supplement relating to those subordinated debt securities.

We will describe the specific terms relating to each particular series of debt securities in the prospectus supplement relating to the offering of those debt securities. The terms we will describe in the prospectus supplement will include some or all of the following:

- the title and type of the debt securities;
- the total principal amount or initial offering price of the debt securities;
- the date or dates when the principal of the debt securities will be payable;
- whether we will have the right to extend the stated maturity of the debt securities;
- whether the debt securities will bear interest and, if so, the rate or rates, or the method for calculating the rate or rates, of interest;
- if the debt securities will bear interest, the date from which interest will accrue, the dates when interest will be payable and the regular record dates for these interest payment dates;

- the place where the principal, premium, if any, and interest, if any, on the debt securities will be paid, registered debt securities may be surrendered for registration of transfer, and debt securities may be surrendered for exchange;
- any sinking fund or other provisions that would obligate us to repurchase or otherwise redeem the debt securities;
- the terms and conditions upon which we will have the option or the obligation to redeem the debt securities;
- the denominations in which any registered debt securities will be issuable;
- the identity of each security registrar and paying agent, and the designation of the exchange rate agent, if any, if other than the trustee;
- the portion of the principal amount of debt securities that will be payable upon acceleration of the maturity of the debt securities;
- the currency used to pay principal, premium, if any, and interest, if any, on the debt securities, if other than U.S. dollars, and whether you or we may elect to have principal, premium and interest paid in a currency other than the currency in which the debt securities are denominated;
- any index, formula or other method used to determine the amount of principal, premium or interest on the debt securities;
- any changes or additions to the events of default, defaults or our covenants made in the applicable indenture;
- whether the debt securities are issuable as registered debt securities or bearer debt securities, whether there are any restrictions relating to the form in which they are issued and whether bearer and registered debt securities may be exchanged for each other;
- to whom interest will be payable
 - o if other than the registered holder (for registered debt securities),
 - o if other than upon presentation and surrender of the related coupons (for bearer debt securities), or
 - o if other than as specified in the indentures (for global debt securities);
- whether the debt securities are to be convertible or exchangeable for other securities and, if so, the terms of conversion or exchange;
- particular terms of subordination with respect to subordinated debt securities; and
- any other terms of the debt securities consistent with the provisions of the applicable indenture.

We may issue debt securities as original issue discount securities to be sold at a substantial discount below their principal amount. If we issue original issue discount securities, then we will describe the material U.S. federal income tax consequences that apply to those debt securities in the applicable prospectus supplement.

Registration and Transfer

We presently plan to issue each series of debt securities only as registered securities. However, we may issue a series of debt securities as bearer securities, or a combination of both registered securities and bearer securities. If we issue senior debt securities as bearer securities, they will have interest coupons attached unless we elect to issue them as zero coupon securities. If we issue bearer securities, we may describe material U.S. federal income tax consequences and other material considerations, procedures and limitations in the applicable prospectus supplement.

Holders of registered debt securities may present the debt securities for exchange for different authorized amounts of other debt securities of the same series and in the same aggregate principal amount at the corporate trust office of the trustee or at the office of any other transfer agent we may designate for the purpose and describe in the applicable prospectus supplement. The registered securities must be duly endorsed or accompanied by a written instrument of transfer. The agent will not impose a service charge on you for the transfer or exchange. We may, however, require that you pay any applicable tax or other governmental charge. If we issue bearer securities, we will describe any procedures for exchanging those bearer securities for other senior debt securities of the same series in the applicable prospectus supplement. Generally, we will not allow you to exchange registered securities for bearer securities.

In general, unless otherwise specified in the applicable prospectus supplement, we will issue registered securities without coupons and in denominations of \$1,000 or integral multiples, and bearer securities in denominations of \$5,000. We may issue both registered and bearer securities in global form.

Conversion and Exchange

If any debt securities will be convertible into or exchangeable for our common stock, preferred stock or other securities, the applicable prospectus supplement will set forth the terms and conditions of the conversion or exchange, including:

- the conversion price or exchange ratio;
- the conversion or exchange period;
- whether the conversion or exchange will be mandatory or at the option of the holder or us;
- provisions for adjustment of the conversion price or exchange ratio; and
- provisions that may affect the conversion or exchange if the debt securities are redeemed.

Redemption

Unless otherwise indicated in the applicable prospectus supplement, we may, at our option, redeem any series of debt securities in whole at any time or in part from time to time. If any series of debt securities are redeemable only on or after a certain date or only upon satisfaction of additional conditions, the applicable prospectus supplement will specify the date or the additional conditions. Unless otherwise specified in the applicable prospectus supplement, the redemption price for debt securities will equal 100% of the principal amount plus any accrued and unpaid interest on those debt securities.

The applicable prospectus supplement will contain the specific terms on which we may redeem a series of debt securities prior to its stated maturity. Unless otherwise described in the prospectus supplement relating to a particular offering, we will send a notice of redemption to holders at least 30 days but not more than 60 days prior to the redemption date. The notice will state:

- the redemption date;
- the redemption price;
- if less than all of the debt securities of the series are being redeemed, the particular debt securities to be redeemed (and the principal amounts, in the case of a partial redemption);
- that on the redemption date, the redemption price will become due and payable and any applicable interest will cease to accrue on and after that date;
- the place or places of payment;
- whether the redemption is for a sinking fund; and
- any other provisions required by the terms of the debt securities of the series that are being redeemed.

On or before any redemption date, we will deposit an amount of money with the trustee or with a paying agent sufficient to pay the redemption price.

Unless otherwise described in the prospectus supplement relating to a particular offering, if we are redeeming less than all the debt securities, the trustee will select the debt securities to be redeemed using a method it considers fair and appropriate. After the redemption date, holders of redeemed debt securities will have no rights with respect to the debt securities except the right to receive the redemption price and any unpaid interest to the redemption date.

Events of Default

Unless otherwise described in the prospectus supplement relating to a particular offering, an “event of default” regarding any series of debt securities is any one of the following events:

- default for 30 days in the payment of any interest installment when due and payable;
- default in the making of any sinking fund payment when due;
- default in the payment of principal or premium (if any) when due at its stated maturity, by declaration, when called for redemption or otherwise;
- default in the performance of any covenant in the debt securities of that series or in the applicable indenture for 60 days after notice to us by the trustee or by the holders of 25% in principal amount of the outstanding debt securities of that series;
- certain events of bankruptcy, insolvency and reorganization; and
- any other event of default provided with respect to that series of debt securities.

We are required to file every year with each trustee an officers’ certificate stating whether any default exists and specifying any default that exists.

Acceleration of Maturity

Unless otherwise described in the prospectus supplement relating to a particular offering, if an event of default has occurred and is continuing with respect to debt securities of a particular series (except, in the case of subordinated debt securities, defaults relating to bankruptcy events), the trustee or the holders of not less than 25% in principal amount of outstanding debt securities of that series may declare the principal amount of outstanding debt securities of that series due and payable immediately.

Unless otherwise described in the prospectus supplement relating to a particular offering, at any time after a declaration of acceleration of maturity with respect to debt securities of any series has been made and before a judgment or decree for payment of the money due has been obtained by the trustee, the holders of a majority in principal amount of the outstanding debt securities of that series by written notice to us and the trustee, may rescind and annul the declaration and its consequences if:

- we have paid or deposited with the trustee a sum sufficient to pay:
 - o all overdue interest on all outstanding debt securities of that series and any related coupons,
 - o all unpaid principal of and premium, if any, on any of the debt securities which has become due otherwise than by the declaration of acceleration, and interest on the unpaid principal at the rate or rates prescribed in the debt securities,
 - o to the extent lawful, interest on overdue interest at the rate or rates prescribed in the debt securities, and
 - o all sums paid or advanced by the trustee and the reasonable compensation, expenses, disbursements and advances of the trustee, its agents and counsel; and
- all events of default with respect to debt securities of that series, other than the non-payment of amounts of principal, interest or any premium on the debt securities which have become due solely by the declaration of acceleration, have been cured or waived.

No rescission will affect any subsequent default or impair any right consequent thereon.

Waiver of Defaults

Unless otherwise described in the prospectus supplement relating to a particular offering, the holders of not less than a majority in principal amount of the outstanding debt securities of any series may, on behalf of the holders of all the debt securities of the series and any related coupons, waive any past default under the applicable indenture with respect to the series and its consequences, except a default:

- in the payment of the principal of or premium, if any, or interest on any debt security of the series or any related coupon, or
- in respect of a covenant or provision that cannot be modified or amended without the consent of the holder of each outstanding debt security of the series affected thereby.

If an event of default with respect to debt securities of a particular series occurs and is continuing, the trustee will not be obligated to exercise any of its rights or powers under the applicable indenture at the request or direction of any of the holders of debt securities of the series, unless the holders have offered to the trustee reasonable indemnity and security against the costs, expenses and liabilities that might be incurred by it in compliance with the request.

The holders of a majority in principal amount of the outstanding debt securities of any series have the right to direct the time, method and place of conducting any proceeding for any remedy available to the trustee under the applicable indenture, or exercising any trust or power conferred on the trustee with respect to the debt securities of that series. The trustee may refuse to follow directions in conflict with law or the indenture that may expose the trustee to personal liability or may be unduly prejudicial to the other, non-directing holders. Additionally, the trustee may take any other action the trustee deems proper which is not inconsistent with the direction.

Modification of Indenture

We and the trustee may, without the consent of any holders of debt securities, enter into supplemental indentures for various purposes, including:

- to evidence the succession of another entity to us and the assumption by the successor of our covenants and obligations under the debt securities and the indenture;
- establishing the form or terms of any series of debt securities issued under the supplemental indentures;
- adding to our covenants for the benefit of the holders or to surrender any of our rights or powers under the indenture;
- adding additional events of default for the benefit of the holders;
- to change or eliminate any provisions of the indenture provided that the change or elimination becomes effective only when there is no debt security outstanding entitled to the benefit of any changed or eliminated provision;
- to secure the debt securities;
- to cure any ambiguities or correct defective or inconsistent provisions of the indenture, provided that holders of debt securities are not materially affected by the change;
- to evidence and provide for acceptance of a successor trustee; and
- to comply with the requirements of the Trust Indenture Act.

We and the trustee may, with the consent of the holders of not less than a majority in principal amount of the outstanding debt securities of all affected series acting as one class, execute supplemental indentures adding any provisions to or changing or eliminating any of the provisions of the indenture or modifying the rights of the holders of the debt securities of the series. Without the consent of the holders of all the outstanding debt securities affected thereby, no supplemental indenture may:

- change the stated maturity of the principal of, or any installment of principal of or interest on, any debt security;
- reduce the principal amount of, the rate of interest on or any premium payable upon the redemption of, or change the manner of calculating the rate of interest on, any debt security;
- reduce the amount of the principal of any original issue discount security that would be due and payable upon acceleration of the maturity of the debt security;
- change the place of payment where, or the currency in which, principal or interest on any debt security is payable;

- impair the right to institute suit for enforcement of payments;
- reduce the percentage in principal amount of the outstanding debt securities of any series, the holders of which must consent to a supplemental indenture or any waiver of compliance with various provisions of, or defaults and covenants under, the indenture; or
- modify any of the provisions described in this section.

Consolidation, Merger and Sale of Assets

Unless otherwise described in the prospectus supplement relating to a particular offering, as provided in the indentures, we may not consolidate with or merge into any other person, or convey, transfer or lease all or substantially all of our assets to any other person, unless:

- the person surviving or formed by the transaction is organized and validly existing under the laws of any United States jurisdiction and expressly assumes our obligations under the debt securities and the indentures;
- immediately after giving effect to the transaction, no event of default will have occurred and be continuing under the indentures; and
- the trustees under the indentures receive certain officers' certificates and opinions of counsel.

Satisfaction and Discharge

We may terminate our obligations with respect to debt securities of any series not previously delivered to the trustee for cancellation when those debt securities:

- have become due and payable;
- will become due and payable at their stated maturity within one year; or
- are to be called for redemption within one year under arrangements satisfactory to the indenture trustee for giving notice of redemption.

We may terminate our obligations with respect to the debt securities of a series by depositing with the trustee, as trust funds in trust dedicated solely for that purpose, an amount sufficient to pay and discharge the entire indebtedness on the debt securities of that series. In that case, the applicable indenture will cease to be of further effect, and our obligations will be satisfied and discharged with respect to that series (except our obligations to pay all other amounts due under the indenture and to provide certain officers' certificates and opinions of counsel to the trustee). At our expense, the trustee will execute proper instruments acknowledging the satisfaction and discharge.

The Trustees

Any trustee may be deemed to have a conflicting interest for purposes of the Trust Indenture Act and may be required to resign as trustee if there is an event of default under the applicable indenture and, as more fully described in Section 310(b) of the Trust Indenture Act, one or more of the following occurs:

- the trustee is a trustee under another indenture under which our securities are outstanding;
- the trustee is a trustee for more than one outstanding series of debt securities under a single indenture;

- we or our affiliates or underwriters hold certain threshold ownership beneficial ownership interest in the trustee;
- the trustee holds certain threshold beneficial ownership interests in us or in securities of ours that are in default;
- the trustee is one of our creditors; or
- the trustee or one of its affiliates acts as an underwriter or agent for us.

We may appoint an alternative trustee for any series of debt securities. The appointment of an alternative trustee would be described in the applicable prospectus supplement.

We and our affiliates may engage in transactions with the trustee and its affiliates in the ordinary course of business.

Governing Law

Each of the indentures are, and the related senior debt securities and subordinated debt securities will be, governed by and construed under the internal laws of the State of New York.

DESCRIPTION OF THE WARRANTS

We may issue warrants to purchase debt securities, preferred stock or common stock. We may offer warrants separately or together with one or more additional warrants, debt securities, shares of preferred stock or common stock, or any combination of those securities in the form of units, as described in the applicable prospectus supplement. If we issue warrants as part of a unit, the prospectus supplement will specify whether those warrants may be separated from the other securities in the unit prior to the warrants' expiration date. We may issue the warrants under warrant agreements to be entered into between us and a bank or trust company, as warrant agent, all as described in the prospectus supplement. If we issue the warrants under warrant agreements, the warrant agent will act solely as our agent in connection with the warrants and will not assume any obligation or relationship of agency or trust for or with any holders or beneficial owners of warrants.

We will describe the particular terms of any warrants that we offer in the prospectus supplement relating to those warrants. Those terms may include the following:

- the specific designation and aggregate number of warrants, and the price at which we will issue the warrants;
- the currency or currency units in which the offering price, if any, and the exercise price are payable;
- the date on which the right to exercise the warrants will begin and the date on which the right will expire or, if the warrants are not continuously exercisable throughout that period, the specific date or dates on which they are exercisable;
- whether the warrants will be issued in fully registered form or bearer form, in definitive or global form or in any combination of these forms;
- any applicable material United States federal income tax considerations;
- the identity of the warrant agent, if any, for the warrants and of any other depositaries, execution or paying agents, transfer agents, registrars or other agents;
- the designation, aggregate principal amount, currency, denomination and terms of any debt securities that may be purchased upon exercise of the warrants;
- the designation, amount, currency, denominations and terms of any preferred stock or common stock purchasable upon exercise of the warrants;
- if applicable, the designation and terms of the debt securities, preferred stock or common stock with which the warrants are issued and the number of warrants issued with each security;
- if applicable, the date from and after which the warrants and the related debt securities, preferred stock or common stock will be separately transferable;
- the principal amount of debt securities or the number of shares of preferred stock or common stock purchasable upon exercise of any warrant and the price at which those shares may be purchased;
- provisions for changes to or adjustments in the exercise price;
- if applicable, the minimum or maximum number of warrants that may be exercised at any one time;
- information with respect to any book-entry procedures;
- any antidilution provision of the warrants;

- any redemption or call provisions; and
- any additional terms of the warrants, including terms, procedures and limitations relating to the exchange and exercise of the warrants.

Our Outstanding Warrants

February 2017 Public Offering Warrants

We entered a underwriting agreement dated February 9, 2017 with certain accredited investors pursuant to which we agreed to sell in the aggregate 3,710,000 units, with each unit consisting of: (i) one share of Company common stock, (ii) a five-year Series A warrant to purchase 0.50 of a share of Company common stock, (iii) a 90-day Series B warrant to purchase one share of Company common stock, and (iv) a five-year Series C warrant to purchase 0.50 of a share of Company common stock. The Series C warrants in a unit may only be exercised to the extent and in proportion to a holder of the Series C warrants exercising its Series B warrants included in the unit. The exercise price of the Series A, Series B, and Series C warrants are \$1.50, \$1.35 and \$1.50, respectively. In addition, pursuant to our agreement with our underwriters, as partial compensation, we issued the underwriters warrants (“Broker warrants”) to purchase 259,700 shares of common stock exercisable for a period of 5 years from date of issuance at an exercise price of \$1.35 per share. As part of this offering, 8,235,923 warrants in the aggregate were issued. Prior to March 31, 2017, certain Series B and C warrants were exercised, leaving 7,639,621 Series A, B, C and Broker warrants in the aggregate outstanding.

On May 15, 2017, 5,087,715 warrants expired, which represented our unexercised Series B warrants along with the associated unvested Series C warrants. During the month of June 2017, a total of 1,308,245 Series A warrants and 295,650 Series C warrants were exercised, which resulted in additional \$2.4 million in cash being received by the Company. Subsequent to June 30, 2017, 61,050 additional Series A warrants were exercised. As of July 19, 2017, 1,664,945 Series A and Series C warrants have been exercised, leaving 886,961 Series A, Series C, and Broker warrants outstanding.

IPO Underwriters' Warrants

On May 31, 2016, we completed our IPO. Pursuant to our agreement with our underwriters, as partial compensation, we issued the underwriters warrants to purchase 107,802 shares of common stock exercisable for a period of 5 years from date of issuance at an exercise price of \$7.50 per share.

DESCRIPTION OF THE UNITS

We may issue, in one or more series, units comprised of shares of our common stock or preferred stock, warrants to purchase common stock or preferred stock, debt securities or any combination of those securities. Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security.

We may evidence units by unit certificates that we issue under a separate agreement. We may issue the units under a unit agreement between us and one or more unit agents. If we elect to enter into a unit agreement with a unit agent, the unit agent will act solely as our agent in connection with the units and will not assume any obligation or relationship of agency or trust for or with any registered holders of units or beneficial owners of units. We will indicate the name and address and other information regarding the unit agent in the applicable prospectus supplement relating to a particular series of units if we elect to use a unit agent.

We will describe in the applicable prospectus supplement the terms of the series of units being offered, including: (i) the designation and terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately; (ii) any provisions of the governing unit agreement that differ from those described herein; and (iii) any provisions for the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units.

The other provisions regarding our common stock, preferred stock, warrants and debt securities as described in this section will apply to each unit to the extent such unit consists of shares of our common stock, preferred stock, warrants and/or debt securities.

PLAN OF DISTRIBUTION

We may sell the securities covered by this prospectus in one or more of the following ways from time to time:

- to or through underwriters or dealers for resale to the purchasers;
- directly to purchasers;
- through agents or dealers to the purchasers; or
- through a combination of any of these methods of sale.

In addition, we may enter into derivative or other hedging transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. The applicable prospectus supplement may indicate that third parties may sell securities covered by this prospectus and the prospectus supplement, including in short sale transactions, in connection with those derivatives. If so, the third party may use securities we pledge or that are borrowed from us or others to settle those sales or to close out any related open borrowings of stock, and may use securities received from us in settlement of those derivatives to close out any related open borrowings of stock. The third party in those sale transactions will be an underwriter and, if applicable, will be identified in the prospectus supplement (or a post-effective amendment thereto).

A prospectus supplement with respect to each series of securities will include, to the extent applicable:

- the terms of the offering;
- the name or names of any underwriters, dealers, remarketing firms, or agents and the terms of any agreement with those parties, including the compensation, fees, or commissions received by, and the amount of securities underwritten, purchased, or remarketed by, each of them, if any;

- the public offering price or purchase price of the securities and an estimate of the net proceeds to be received by us from any such sale, as applicable;
- any underwriting discounts or agency fees and other items constituting underwriters' or agents' compensation;
- the anticipated delivery date of the securities, including any delayed delivery arrangements, and any commissions we may pay for solicitation of any such delayed delivery contracts;
- that the securities are being solicited and offered directly to institutional investors or others;
- any discounts or concessions to be allowed or reallocated or to be paid to agents or dealers; and
- any securities exchange on which the securities may be listed.

Any offer and sale of the securities described in this prospectus by us, any underwriters, or other third parties described above may be effected from time to time in one or more transactions, including, without limitation, privately negotiated transactions, either:

- at a fixed public offering price or prices, which may be changed;
- at market prices prevailing at the time of sale;
- at prices related to prevailing market prices at the time of sale; or
- at negotiated prices.

Offerings of securities covered by this prospectus also may be made into an existing trading market for those securities in transactions at other than a fixed price, either:

- on or through the facilities of the NASDAQ Capital Market or any other securities exchange or quotation or trading service on which those securities may be listed, quoted, or traded at the time of sale; and/or
- to or through a market maker otherwise than on the NASDAQ Capital Market or those other securities exchanges or quotation or trading services.

Those at-the-market offerings, if any, will be conducted by underwriters acting as our principal or agent, who may also be third-party sellers of securities as described above.

In addition, we may sell some or all of the securities covered by this prospectus through:

- purchases by a dealer, as principal, who may then resell those securities to the public for its account at varying prices determined by the dealer at the time of resale or at a fixed price agreed to with us at the time of sale;
- block trades in which a dealer will attempt to sell as agent, but may position or resell a portion of the block as principal in order to facilitate the transaction; and/or
- ordinary brokerage transactions and transactions in which a broker-dealer solicits purchasers.

Any dealer may be deemed to be an underwriter, as that term is defined in the Securities Act of 1933 of the securities so offered and sold.

In connection with offerings made through underwriters or agents, we may enter into agreements with those underwriters or agents pursuant to which we receive our outstanding securities in consideration for the securities being offered to the public for cash. In connection with these arrangements, the underwriters or agents also may sell securities covered by this prospectus to hedge their positions in any such outstanding securities, including in short sale transactions. If so, the underwriters or agents may use the securities received from us under those arrangements to close out any related open borrowings of securities.

We may loan or pledge securities to a financial institution or other third party that in turn may sell the loaned securities or, in any event of default in the case of a pledge, sell the pledged securities using this prospectus and the applicable prospectus supplement. That financial institution or third party may transfer its short position to investors in our securities or in connection with a simultaneous offering of other securities covered by this prospectus.

We may solicit offers to purchase the securities covered by this prospectus directly from, and we may make sales of such securities directly to, institutional investors or others, who may be deemed to be underwriters within the meaning of the Securities Act with respect to any resale of such securities.

The securities may also be offered and sold, if so indicated in a prospectus supplement, in connection with a remarketing upon their purchase, in accordance with a redemption or repayment pursuant to their terms, or otherwise, by one or more remarketing firms acting as principals for their own accounts or as agents for us.

If indicated in the applicable prospectus supplement, we may sell the securities through agents from time to time. We generally expect that any agent will be acting on a "best efforts" basis for the period of its appointment.

If underwriters are used in any sale of any securities, the securities may be either offered to the public through underwriting syndicates represented by managing underwriters, or directly by underwriters. Unless otherwise stated in a prospectus supplement, the obligations of the underwriters to purchase any securities will be conditioned on customary closing conditions, and the underwriters will be obligated to purchase all of that series of securities, if any are purchased.

Underwriters, dealers, agents, and remarketing firms may at the time of any offering of securities be entitled under agreements entered into with us to indemnification by us against certain civil liabilities, including liabilities under the Securities Act, or to contribution with respect to payments that the underwriters, dealers, agents, and remarketing firms may be required to make. Underwriters, dealers, agents, and remarketing agents may be customers of, engage in transactions with, or perform services in the ordinary course of business for us and/or our affiliates.

Any underwriters to whom securities covered by this prospectus are sold by us for public offering and sale, if any, may make a market in the securities, but those underwriters will not be obligated to do so and may discontinue any market making at any time without notice.

LEGAL MATTERS

Schiff Hardin LLP, Washington, DC, will pass upon the validity of the securities offered by this prospectus for us. Legal matters will be passed upon for any underwriters, dealers or agents by counsel named in the applicable prospectus supplement.

EXPERTS

The financial statements of Moleculin Biotech, Inc. as of December 31, 2015 and for the period from July 28, 2015 (inception) to December 31, 2015 incorporated by reference in this prospectus have been audited by GBH CPAs, PC, an independent registered public accounting firm, as stated in their report appearing therein. Such financial statements have been so included in reliance upon the report of such firm given upon their authority as experts in accounting and auditing.

The audited financial statements of Moleculin Biotech, Inc. as of December 31, 2016 and for the year then ended incorporated by reference in this prospectus and elsewhere in the registration statement have been incorporated by reference in reliance upon the report of Grant Thornton LLP, independent registered public accountants, upon the authority of said firm as experts in accounting and auditing.

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The following table sets forth the estimated costs and expenses, other than the underwriting discounts and commissions, payable by the registrant in connection with the offering of the securities being registered. All the amounts shown are estimates, except for the registration fee.

These fees are calculated based on the number of issuances and amount of securities offered and accordingly cannot be estimated at this time. An estimate of the aggregate expenses in connection with the issuance and distribution of the securities being offered will be included in the applicable prospectus supplement.

SEC registration fee	8,692.50	
Printing fees and expenses		*
Legal fees and expenses		*
Accounting fees and expenses		*
Miscellaneous fees and expenses		*
Total	\$	*

* Estimated expenses are not presently known. The foregoing sets forth the general categories of expenses that we anticipate we will incur in connection with the offering of securities under this registration statement. An estimate of the aggregate expenses in connection with the issuance and distribution of the securities being offered will be included in the applicable prospectus supplement, information incorporated by reference or related free writing prospectus.

Item 15. Indemnification of Directors and Officers

MBI's Certificate of Incorporation and Bylaws authorize it to indemnify directors, officers, employees and agents of MBI against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement, actually and reasonably incurred in connection with any action, suit or proceeding, if the party to be indemnified acted in good faith and in a manner that he or she reasonably believed to be in or not opposed to the best interests of MBI, and, with respect to any criminal action or proceeding, such party had no reasonable cause to believe his conduct was unlawful. The Certificate of Incorporation and the Bylaws of MBI also authorize it to indemnify directors, officers, employees and agents of MBI who are or were a party to or threatened to be a party to, any threatened, pending, or completed action or suit by or in the right of MBI to procure a judgment in its favor by reason of the fact the he or she was a director, officer, employee or agent of MBI or of another entity at the request of MBI, against expenses (including reasonable attorneys' fees) actually and reasonably incurred by him or her in connection with the defense or settlement of such action or suit if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of MBI.

The Bylaws also permit MBI to enter into indemnity agreements with its employees and agents. MBI has entered into such agreements with its directors and officers, and may in the future enter into such agreements with other employees or agents. These agreements, together with the Bylaws and Certificate of Incorporation, may require MBI, among other things, to indemnify employees or agents against certain liabilities that may arise by reason of their status or service as directors (other than liabilities resulting from willful misconduct of a culpable nature), to advance expenses to them as they are incurred, provided that they undertake to repay the amount advanced if it is ultimately determined by a court that they are not entitled to indemnification, and to obtain and maintain directors' and officers' insurance if available on reasonable terms.

MBI's Certificate of Incorporation provides that directors shall have no personal liability to MBI or its stockholders for monetary damages for breach of fiduciary duty as a director, except (i) for any breach of a director's duty of loyalty to MBI 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 General Corporation Law of Delaware as it may from time to time be amended or any successor provision thereto, or (iv) for any transaction from which a director derived an improper personal benefit.

MBI currently has directors' and officers' liability insurance. Delaware General Corporation Law, Section 145, and the Certificate of Incorporation and Bylaws of MBI provide for the indemnification of officers, directors and other corporate agents in terms sufficiently broad to indemnify such persons, under certain circumstances, for liabilities (including reimbursement of expenses incurred) arising under the Securities Act.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons pursuant to the foregoing provisions, or otherwise, MBI 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.

Item 16. Exhibits

The Exhibits filed herewith are set forth on the Exhibit Index filed as part of this registration statement.

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 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 Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 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 paragraphs (1)(i), (1)(ii) and (1)(iii) 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 Commission by the registrant pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of 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) Each prospectus filed by the Registrant pursuant to Rule 424(b)(3) shall be deemed to be part of this Registration Statement as of the date the filed prospectus was deemed part of and included in this Registration Statement; and

(ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) (§ 230.424(b)(2), (b)(5), or (b)(7) of this chapter) 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) (§ 230.415(a)(1)(i), (vii), or (x) of this chapter) 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.

(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, 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.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) 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.

(c) 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 a 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.

(d) 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.

(e) The undersigned registrant hereby undertakes to file an application for the purpose of determining the eligibility of the trustee to act under subsection (a) of section 310 of the Trust Indenture Act in accordance with the rules and regulations prescribed by the Commission under section 305(b)(2) of the Trust Indenture Act.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, 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 registration statement to be signed on its behalf by the undersigned thereunto duly authorized, in the City of Houston, State of Texas, on August 11, 2017.

MOLECULIN BIOTECH, INC.

By: /S/ Walter V. Klemm
Name: Walter V. Klemm
Title: *Chief Executive Officer and Chairman of the Board*

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated:

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Walter V. Klemm</u> Walter V. Klemm	Chairman of the Board and Chief Executive Officer (Principal Executive Officer)	August 11, 2017
<u>/s/ Jonathan P. Foster</u> Jonathan P. Foster	Executive Vice President & Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	August 11, 2017
* <u>Robert E. George</u>	Director	August 11, 2017
* <u>Michael D. Cannon</u>	Director	August 11, 2017
<u>/s/ John M. Climaco</u> John M. Climaco	Director	August 11, 2017
* By: <u>/s/ Jonathan P. Foster</u> Jonathan P. Foster Attorney-in-fact		

INDEX TO EXHIBITS

EXHIBIT NO.	IDENTIFICATION OF EXHIBIT
1.1	Form of Underwriting Agreement +
3.1	Amended and Restated Certificate of Incorporation of Moleculin Biotech, Inc. (incorporated by reference to exhibit 3.1 of the Form S-1/A filed March 21, 2016)
3.2	Amended and Restated Bylaws of Moleculin Biotech, Inc. (incorporated by reference to exhibit 3.2 of the Form S-1/A filed March 21, 2016)
4.1	Form of Series A/B/C Warrant Agreement (incorporated by reference to Exhibit 1.1 to our Form 8-K filed February 9, 2017)
4.2	Form of Unsubordinated Indenture (1)
4.3	Form of Subordinated Indenture (1)
4.4	Form of Certificate of Designation for Preferred Stock+
4.5	Form of Preferred Stock Certificate ⁺
4.6	Form of Warrant Certificate ⁺
4.7	Form of Warrant Agreement ⁺
4.8	Form of Unit Agreement and Certificate ⁺
5	Opinion of Schiff Hardin LLP (1)
23.1	Consent of GBH CPAs, PC [*]
23.2	Consent of Grant Thornton LLP [*]
23.3	Consent of Schiff Hardin LLP (included in Exhibit 5) (1)
24.1	Power of Attorney (included on signature page)
25.1	Form T-1 Statement of Eligibility of Trustee under the Unsubordinated Indenture [#]
25.2	Form T-1 Statement of Eligibility of Trustee under the Subordinated Indenture [#]

* Filed herewith

⁺ As applicable, to be filed by amendment or by a report filed under the Securities Exchange Act of 1934, as amended, and incorporated herein by reference

[#] As applicable, to be incorporated herein by reference from a subsequent filing in accordance with Section 305(b)(2) of the Trust Indenture Act.

(1) Previously filed.

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statement on Form S-3 (Amendment No. 1) of our report dated March 21, 2016 relating to the financial statements of Moleculin Biotech, Inc. as of December 31, 2015 and for the period from July 28, 2015 (Inception) to December 31, 2015. We also consent to the reference to our firm under the heading "Experts" appearing therein.

/s/ GBH CPAs, PC

GBH CPAs, PC
www.gbhcpas.com
Houston, Texas
August 11, 2017

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our report dated April 3, 2017 with respect to the financial statements of Moleculin Biotech, Inc. included in the Annual Report on Form 10-K for the year ended December 31, 2016, which is incorporated by reference in this Amendment No. 1 to Registration Statement No. 333-219434. We consent to the incorporation by reference of the aforementioned report in this Amendment No. 1 to Registration Statement No. 333-219434, and to the use of our name as it appears under the caption "Experts."

/s/ GRANT THORNTON LLP

Houston, Texas
August 11, 2017
