

**Prospectus Supplement  
(to Prospectus dated August 21, 2017)**

**\$15,000,000**



**Common Stock**

We have entered into an At Market Issuance Sales Agreement, or sales agreement, with Oppenheimer & Co. Inc. (the "Agent"), relating to the sale of shares of our common stock offered by this prospectus supplement and the accompanying prospectus. In accordance with the terms of the sales agreement, we may offer and sell shares of our common stock having an aggregate offering price of up to \$15.0 million from time to time through the Agent acting as our sales agent, at our discretion.

Our common stock is listed on The NASDAQ Capital Market under the symbol "MBRX." On July 22, 2019, the last reported sale price of our common stock on The NASDAQ Capital Market was \$1.17 per share.

Sales of our common stock, if any, under this prospectus supplement and the accompanying prospectus may be made in sales deemed to be "at the market offerings" as defined in Rule 415 promulgated under the Securities Act of 1933, as amended, or the Securities Act. The Agent is not required to sell any specific number or dollar amount of securities, but will act as a sales agent using commercially reasonable efforts consistent with its normal trading and sales practices, on mutually agreed terms between the Agent and us. There is no arrangement for funds to be received in any escrow, trust or similar arrangement.

The Agent will receive compensation in the form of a fixed commission rate of 3% of the gross proceeds from each sale of common stock sold through the Agent pursuant to the sales agreement. In connection with the sale of the common stock on our behalf, the Agent will be deemed to be an "underwriter" within the meaning of the Securities Act, and the compensation of the Agent will be deemed to be underwriting commissions or discounts. We have also agreed to provide indemnification and contribution to the Agent with respect to certain liabilities, including liabilities under the Securities Act.

**Investing in our securities involves significant risks. Please read the information contained in or incorporated by reference under the heading "Risk Factors" beginning on page S-4 of this prospectus supplement, and under similar headings in other documents filed after the date hereof and incorporated by reference into this prospectus supplement and the accompanying prospectus.**

**Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus supplement or the accompanying prospectus. Any representation to the contrary is a criminal offense.**

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**Oppenheimer & Co.**

The date of this prospectus supplement is July 23, 2019

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### **About This Prospectus Supplement**

This prospectus supplement and the accompanying prospectus relate to the offering of our common stock. You should read this prospectus supplement, the accompanying prospectus, the documents incorporated by reference into this prospectus supplement and the accompanying prospectus, and any free writing prospectus that we may authorize for use in connection with this offering, in their entirety before making an investment decision. You should also read and consider the information in the documents to which we have referred you in the section of this prospectus supplement entitled “Where You Can Find More Information” and “Incorporation by Reference.” These documents contain important information that you should consider when making your investment decision.

This document is in two parts. The first part is this prospectus supplement, which describes the specific terms of the offering of the common stock and also adds to and updates information contained in the accompanying prospectus and the documents incorporated by reference into this prospectus supplement and the accompanying prospectus. The second part, the accompanying prospectus, including the documents incorporated by reference into the accompanying prospectus, provides more general information, some of which may not apply to this offering. Generally, when we refer to this prospectus, we are referring to the combined document consisting of this prospectus supplement and the accompanying prospectus. To the extent there is a conflict between the information contained in this prospectus supplement, on the one hand, and the information contained in the accompanying prospectus or in any document incorporated by reference into the accompanying prospectus that was filed with the Securities and Exchange Commission, or SEC, before the date of this prospectus supplement, on the other hand, you should rely on the information in this prospectus supplement. If any statement in one of these documents is inconsistent with a statement in another document having a later date, the statement in the document having the later date modifies or supersedes the earlier statement.

We are responsible for the information contained in, or incorporated by reference into, this prospectus supplement, the accompanying prospectus and in any free writing prospectus that we may authorize for use in connection with this offering. We have not, and the Agent has not, authorized any other person to provide you with different information, and neither we nor the Agent take any responsibility for any other information that others may give you.

We are not, and the Agent is not, making an offer to sell or soliciting an offer to buy our common stock in any jurisdiction in which an offer or solicitation is not authorized or in which the person making that offer or solicitation is not qualified to do so or to anyone to whom it is unlawful to make an offer or solicitation.

You should assume that the information appearing in this prospectus supplement, the accompanying prospectus, the documents incorporated by reference into this prospectus supplement and the accompanying prospectus, and in any free writing prospectus that we may authorize for use in connection with this offering, is accurate only as of the date of those respective documents. Our business, financial condition, results of operations and prospects may have changed since those dates.

Unless the context otherwise requires or as otherwise expressly stated, references in this prospectus to the terms the “Company,” “MBI,” “we,” “our” and “us” or other similar terms mean Moleculin Biotech, Inc., unless we state otherwise or the context indicates otherwise.

## Summary

*This summary highlights information contained elsewhere or incorporated by reference in this prospectus supplement and the accompanying prospectus. This summary does not contain all of the information that you should consider before deciding to invest in our common stock. You should read this entire prospectus supplement and the accompanying prospectus carefully, including the "Risk Factors" section contained in this prospectus supplement, our financial statements and the related notes thereto and the other documents incorporated by reference in this prospectus supplement and the accompanying prospectus.*

## Overview

We are a clinical stage pharmaceutical company focused on the treatment of highly resistant cancers. We have three core technologies, all of which are based on discoveries made at M.D. Anderson Cancer Center. We have three drugs in four clinical trials in the US and Poland. Our clinical stage drugs are Annamycin, believed by management to be a "Next Generation" Anthracycline, being studied for the treatment of relapsed or refractory acute myeloid leukemia, or AML, and WP1066, an Immune/Transcription Modulator targeting brain tumors, pancreatic cancer and AML. Additionally, a third drug, WP1220 (a molecule similar to WP1066), was approved for a clinical trial in January 2019 in Poland for the topical treatment of cutaneous T-cell lymphoma. We are also engaged in preclinical development of additional drug candidates, including additional Immune/Transcription Modulators, as well as Metabolism/Glycosylation Inhibitors.

We believe that our Next Generation Anthracycline, Annamycin, is unlike any currently approved anthracyclines, as it is designed to avoid multidrug resistance mechanisms with little to no cardiotoxicity – hence the use of the term "Next Generation." Annamycin has preliminary clinical data suggesting its potential to become the first successful therapy suitable for the majority of relapsed or refractory AML patients and is currently in two Phase I/II clinical trials.

WP1066 is one of several STAT3 Immune/Transcription Modulators designed to stimulate the immune response to tumors by inhibiting the errant activity of Regulatory T-Cells (TRegs) while also inhibiting key oncogenic transcription factors, including p-STAT3, c-Myc and HIF-1 $\alpha$ . These transcription factors are widely sought targets that may also play a role in the inability of immune checkpoint inhibitors to affect more resistant tumors.

We are also developing new compounds designed to exploit the potential uses of inhibitors of glycolysis such as 2-deoxy-D-glucose ("2-DG"), which we believe may provide an opportunity to cut off the fuel supply of tumors by taking advantage of their high level of dependence on glucose in comparison to healthy cells. A key drawback to 2-DG is its lack of drug-like properties, including a short circulation time and poor tissue/organ distribution characteristics. Our lead Metabolism/Glycosylation Inhibitor, WP1122, is a prodrug of 2-DG that appears to improve the drug-like properties of 2-DG by increasing its circulation time and improving tissue/organ distribution. New research also points to the potential for 2-DG to be capable of enhancing the usefulness of checkpoint inhibitors. Considering that 2-DG lacks sufficient drug-like properties to be practical in a clinical setting, we believe WP1122 may also become an important drug to potentiate checkpoint inhibitors.

## Company Information

We were incorporated on July 28, 2015. Our principal executive office is located at 5300 Memorial Drive, Suite 950, Houston, Texas 77007. Our website address is [www.moleculin.com](http://www.moleculin.com). We do not incorporate by reference into this prospectus supplement the information on our website, and you should not consider it as part of this prospectus supplement.

### **The Offering**

Common stock offered by us	Shares of our common stock having an aggregate offering price of up to \$15.0 million.
Manner of offering	“At the market offering” that may be made from time to time through the Agent, as our sales agent. See “Plan of Distribution” on page S-8 of this prospectus supplement for a more complete description of the manner of offering.
Use of proceeds	We expect to use the net proceeds of this offering, if any, for clinical trials, preclinical programs, for other research and development activities and for general corporate purposes. See “Use of Proceeds” on page S-5 of this prospectus supplement for a more complete description of the intended use of proceeds from this offering.
Risk factors	Investing in our securities involves significant risks. Please read the information contained in or incorporated by reference under the heading “Risk Factors” beginning on page S-4 of this prospectus supplement, and under similar headings in other documents filed after the date hereof and incorporated by reference into this prospectus supplement and the accompanying prospectus.
NASDAQ Capital Market symbol	MBRX

## Risk Factors

*An investment in our securities involves risks. We urge you to consider carefully the risks described below, and in the documents incorporated by reference in this prospectus supplement and the accompanying prospectus, before making an investment decision, including those risks identified under “Item 1A. Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2018, which is incorporated by reference in this prospectus supplement and which may be amended, supplemented or superseded from time to time by other reports that we subsequently file with the SEC. Additional risks, including those that relate to any particular securities we offer, may be included in a future prospectus supplement or free writing prospectus that we authorize from time to time, or that are incorporated by reference into this prospectus supplement or the accompanying prospectus in connection with this offering. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. Please also read carefully the section below entitled “Special Note Regarding Forward-Looking Statements.”*

### **Risks Related to this Offering**

***Sales of our common stock in this offering, or the perception that such sales may occur, could cause the market price of our common stock to fall.***

We may issue and sell shares of our common stock for aggregate gross proceeds of up to \$15.0 million from time to time in connection with this offering. The issuance and sale from time to time of these new shares of common stock, or our ability to issue these new shares of common stock in this offering, could have the effect of depressing the market price of our common stock.

***Our management will have broad discretion over the use of the net proceeds from this offering, you may not agree with how we use the proceeds, and the proceeds may not be invested successfully.***

Our management will have broad discretion as to the use of the net proceeds from any offering by us and could use them for purposes other than those contemplated at the time of this offering. Accordingly, you will be relying on the judgment of our management with regard to the use of these net proceeds, and you will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. It is possible that the proceeds will be invested in a way that does not yield a favorable, or any, return for us.

***You may experience immediate and substantial dilution in the book value per share of the common stock you purchase in the offering.***

The public offering price per share in this offering may exceed the pro forma as adjusted net tangible book value per share of our common stock after giving effect to this offering. Assuming that an aggregate of 12,820,512 shares of our common stock are sold at a price of \$1.17 per share, the last reported sale price of our common stock on The NASDAQ Capital Market on July 22, 2019, for aggregate gross proceeds of up to approximately \$15.0 million, and after deducting commissions and estimated offering expenses payable by us, you will experience immediate dilution of \$0.61 per share, representing the difference between our pro forma as adjusted net tangible book value per share as of March 31, 2019, after giving effect to this offering and the assumed public offering price and after giving effect to the completion of our April 2019 offering. The exercise of outstanding warrants and stock options will result in further dilution of your investment. See the section below entitled “Dilution” for a more detailed illustration of the dilution you would incur if you participate in this offering.

***We will require additional capital funding, the receipt of which may impair the value of our common stock.***

Our future capital requirements depend on many factors, including our research, development, sales and marketing activities. We will need to raise additional capital through public or private equity or debt offerings or through arrangements with strategic partners or other sources in order to continue to develop our drug candidates. There can be no assurance that additional capital will be available when needed or on terms satisfactory to us, if at all. To the extent we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution and the new equity securities may have greater rights, preferences or privileges than our existing common stock.

***We do not intend to pay dividends in the foreseeable future.***

We have never paid cash dividends on our common stock and currently do not plan to pay any cash dividends in the foreseeable future.

**Special Note Regarding Forward-Looking Statements**

This prospectus supplement, the accompanying prospectus and the other documents we have filed with the SEC that are incorporated herein by reference contain forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, regarding our strategy, future operations, future financial position, future revenues, projected costs, prospects, plans, objectives of management or other financial items are forward-looking statements. The words “anticipate,” “believe,” “estimate,” “expect,” “intend,” “may,” “plan,” “predict,” “project,” “will,” “would” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included in this prospectus supplement, particularly as set forth and incorporated by reference in the “Risk Factors” section above, that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures, collaborations or investments we may make. You should read this prospectus supplement, the accompanying prospectus and the documents that we incorporate by reference in this prospectus supplement completely and with the understanding that our actual future results may be materially different from what we expect. We do not assume any obligation to update any forward-looking statements, except as otherwise required by law. We advise you, however, to consult any further disclosures we make on related subjects in our future annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K we file with or furnish to the SEC.

**Use of Proceeds**

We intend to use the net proceeds from this offering for our planned clinical trials, preclinical programs, for other research and development activities and for general corporate purposes. Because there is no minimum offering amount required as a condition to close this offering, the actual total public offering amount, commissions and proceeds to us, if any, are not determinable at this time. There can be no assurance that we will sell any shares under or fully utilize the sales agreement with the Agent as a source of financing.

The amount and timing of our use of the net proceeds from any offerings hereunder will depend on a number of factors, such as the timing and progress of our clinical trial efforts and pre-clinical programs. As of the date of this prospectus supplement, we cannot specify with certainty all of the particular uses for the net proceeds to us from this offering. Accordingly, our management will have broad discretion in the timing and application of these proceeds. Pending application of the net proceeds as described above, we intend to temporarily invest the proceeds in short-term, interest-bearing instruments.

**Dividend Policy**

We have never declared or paid any cash dividends on our capital stock, and we do not currently intend to pay any cash dividends on our common stock for the foreseeable future. We expect to retain future earnings, if any, to fund the development and growth of our business. Any future determination to pay dividends on our common stock will be at the discretion of our board of directors and will depend upon, among other factors, our results of operations, financial condition, capital requirements and any contractual restrictions.

## Dilution

If you purchase shares of our common stock in this offering, you will experience dilution to the extent of the difference between the public offering price per share and the pro forma as adjusted net tangible book value per share after giving effect to this offering. We calculate net tangible book value per share by dividing the net tangible book value, which is tangible assets less total liabilities, by the number of outstanding shares of our common stock. Dilution represents the difference between the public offering price per share paid by purchasers in this offering and the pro forma as adjusted net tangible book value per share of our common stock immediately after giving effect to this offering. Our net tangible book value as of March 31, 2019 was approximately \$3.5 million, or \$0.10 per share.

After giving effect to the sale in April 2019 of 9,375,000 units of common stock and warrants at a public offering price of \$1.60 per unit (assuming no exercise of the warrants included in the units, no value is attributed to such warrants and such warrants are classified and accounted for as equity), and after deducting the placement agent fees and estimated offering expenses payable by us in such offering, our pro forma net tangible book value as of March 31, 2019 would have been \$17.4 million, or \$0.39 per share of common stock.

After giving further effect to the assumed sale in this offering of \$15.0 million of our common stock, at an assumed public offering price of \$1.17 per share, the last reported sale price of our common stock on The NASDAQ Capital Market on July 22, 2019, and after deducting the commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of March 31, 2019 would have been \$31.8 million, or \$0.56 per share of common stock. This represents an immediate increase in the pro forma as adjusted net tangible book value of \$0.17 per share to our existing stockholders and an immediate dilution in net tangible book value of \$0.61 per share to new investors. The following table illustrates this per share dilution:

Assumed public offering price per share		\$	1.17
Net tangible book value per share as of March 31, 2019	\$	0.10	
Increase in net tangible book value per share attributable to the April 2019 offering	\$	0.29	
Pro forma net tangible book value per share after April 2019 offering	\$	0.39	
Increase in pro forma net tangible book value per share attributable to this offering	\$	0.17	
Pro forma as adjusted net tangible book value per share after giving effect to this offering	\$	0.56	
Dilution per share to new investors participating in this offering	\$	0.61	

The above table and discussion is based on 34,409,030 shares of common stock outstanding as of March 31, 2019 and exclude the following, all as of March 31, 2019:

- 2,769,000 shares of common stock issuable upon the exercise of outstanding stock options, vested and unvested, with a weighted-average exercise price of \$2.65 per share;
- 6,777,015 shares of common stock issuable upon the exercise of outstanding warrants with a weighted-average exercise price of \$1.96 per share; and
- up to an aggregate of 1,681,000 shares of common stock reserved for future issuance under our 2015 Stock Plan.

To the extent that options or warrants outstanding as of March 31, 2019 have been or are exercised, or other shares are issued, investors purchasing shares in this offering could experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations, even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

### **Plan of Distribution**

We have entered into an At Market Issuance Sales Agreement, or sales agreement, with Oppenheimer & Co. Inc. (“the Agent”), under which we may, over a period of time and from time to time, offer and sell shares of our common stock having an aggregate sales price of up to \$15.0 million through the Agent, or to the Agent. Sales of our common stock through the Agent, if any, will be made by means of ordinary brokers’ transactions on The NASDAQ Capital Market or otherwise at market prices prevailing at the time of sale or at prices related to such prevailing market prices or as otherwise agreed upon by us. The Agent has advised us that it will not engage in any transactions that stabilize the price of our common stock.

The Agent will use its commercially reasonable efforts to sell the common stock offered hereby, from time to time, based upon instructions in a placement notice from us (including any price, time or size limits or other parameters or conditions we may impose). The Agent’s obligations under the sales agreement to sell our common stock are subject to a number of conditions that we must meet. We or the Agent may suspend the offering of common stock upon proper notice and subject to other conditions.

The Agent has agreed to provide written confirmation of any sales to us no later than the opening of the trading day on The NASDAQ Capital Market following the trading day on which shares of common stock were sold under the sales agreement. Each confirmation will include the number of shares sold on the preceding day, the net proceeds to us and the compensation payable by us to the Agent in connection with the sales.

We will pay the Agent commissions for its services in acting as agent in the sale of common stock offered hereby. Under the sales agreement, the Agent will be entitled to compensation of 3.0% of the gross sales price of all shares sold through it as our agent. Also, we have agreed to reimburse the Agent its expenses incurred by it in connection with this offering, provided expense reimbursement in excess of \$50,000 is subject to our approval, such approval not to be unreasonably withheld, conditioned or delayed. Because there is no minimum offering amount required as a condition to closing this offering, the actual total public offering amount, commissions and proceeds to us, if any, are not determinable at this time.

We estimate that the total expenses for the offering, excluding compensation and reimbursement payable to the Agent under the terms of the sales agreement, will be approximately \$100,000.

If we sell common stock to the Agent, acting as a principal, we will set forth the terms of such transactions in the applicable placement notice and, to the extent required by applicable law, we will describe these terms in a separate prospectus supplement or pricing supplement.

Settlement of sales of common stock will occur on the second trading day following the date on which any sales are made, or on some other date that is agreed upon by us and the Agent in connection with a particular transaction, in return for payment of the net proceeds to us. There is no arrangement for funds to be received in any escrow, trust or similar arrangement. Sales of common stock in this offering, if any, as contemplated by this prospectus supplement and the accompanying base prospectus will be settled through the facilities of The Depository Trust Company or by such other means as we and the Agent may agree upon.

We will report at least quarterly the number of shares of common stock sold through or to the Agent under the sales agreement, the net proceeds to us and the compensation paid by us to the Agent in connection with the sales, if any.

From time to time, the Agent and its affiliates have provided, and may in the future provide, various investment banking and advisory services for us for which they may in the future receive customary fees and expenses. The Agent and its affiliates may, from time to time, engage in other transactions with and perform services for us in the ordinary course of their business. In the course of their businesses, the Agent and its affiliates may actively trade our securities or loans for their own account or for the accounts of customers, and, accordingly, the Agent and its affiliates may at any time hold long or short positions in such securities or loans. The Agent acted as our sole placement agent for our April 2019 public offering of units for which it received placement agent fees of \$900,000, warrants to purchase up to 562,500 shares of our common stock at an exercise price of \$1.75 per share and \$75,000 in expense reimbursement. We also agreed to extend the right of first refusal described below until January 25, 2020. The Agent also acted as the sole underwriter of our March 2019 public offering of units for which it received an underwriting discount of \$321,370, warrants to purchase up to 367,500 shares of our common stock at an exercise price of \$1.10 per share and \$115,000 in expense reimbursement. We also agreed, subject to certain conditions, to provide the Agent with a right of first refusal to act as sole book-running underwriter, sole-lead initial purchaser, sole-lead placement agent, or sole-lead selling agent, as the case may be, on any financing by us on or before September 29, 2019. Except as described above and except for services provided in connection with this offering, the Agent has not provided us with any investment banking or other financial services during the 180-day period preceding the date of this prospectus supplement and we do not expect to retain the Agent to perform any investment banking or other financial services for at least 90 days after the date of this prospectus supplement.

In connection with the sale of our common stock in this offering, the Agent will be deemed to be an “underwriter” within the meaning of the Securities Act and the compensation paid to the Agent will be deemed to be underwriting commissions or discounts. We have agreed to provide indemnification and contribution to the Agent against certain civil liabilities, including liabilities under the Securities Act.

#### Legal Matters

The validity of the common stock offered hereby will be passed upon for us by Schiff Hardin LLP, Washington, DC. Lowenstein Sandler LLP, New York, New York, is acting as counsel to the Agent in connection with this offering.

#### Experts

The audited financial statements of Moleculin Biotech, Inc. as of December 31, 2018 and 2017, and for the years 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.

#### Where You Can Find More Information

This prospectus supplement and the accompanying prospectus are part of a registration statement on Form S-3 we filed with the SEC under the Securities Act and do not contain all the information set forth or incorporated by reference in the registration statement. Whenever a reference is made in this prospectus supplement or the accompanying prospectus to any of our contracts, agreements or other documents, the reference may not be complete and you should refer to the exhibits that are a part of the registration statement or the exhibits to the reports or other documents incorporated by reference into this prospectus supplement or the accompanying prospectus for a copy of such contract, agreement or other document. Because we are subject to the information and reporting requirements of the Exchange Act, we file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy information filed by us with the SEC at the SEC’s public reference section, 100 F Street, N.E., Washington, D.C. 20549. Information regarding the operation of the public reference section can be obtained by calling 1-800-SEC-0330. The SEC also maintains an Internet site at <http://www.sec.gov> that contains reports, statements and other information about issuers, such as us, who file electronically with the SEC.

#### Incorporation by Reference

The SEC allows us to “incorporate by reference” into this prospectus supplement the information in other documents that we file with it. This means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be a part of this prospectus supplement, and information in documents that we file later with the SEC will automatically update and supersede information contained in documents filed earlier with the SEC or contained in this prospectus supplement. We incorporate by reference in this prospectus supplement the documents listed below and any future filings that we may make with the SEC under Sections 13(a), 13(c), 14, or 15(d) of the Exchange Act prior to the termination of the offering under this prospectus supplement; provided, however, that we are not incorporating, in each case, any documents or information deemed to have been furnished and not filed in accordance with SEC rules:

- Our Annual Report on [Form 10-K](#) for the year ended December 31, 2018 (filed on February 21, 2019);
- Our Quarterly Report on [Form 10-Q](#) for the quarter ended March 31, 2019 (filed on May 13, 2019);
- Our Current Reports on Form 8-K filed on [July 12, 2019](#); [May 24, 2019](#); [April 24, 2019](#); [March 28, 2019](#); [March 14, 2019](#); [February 7, 2019](#); and [February 5, 2019](#);
- Definitive Proxy Statement on [Schedule 14A](#) relating to the Company’s 2019 Annual Meeting of Stockholders (filed on April 16, 2019); and
- the description of our common stock, par value \$0.001 per share contained in our Registration Statement on [Form 8-A](#), dated and filed with the SEC on April 28, 2016, and any amendment or report filed with the SEC for the purpose of updating the description.

All reports and other documents we subsequently file pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act prior to the termination of this offering, including all such documents we may file with the SEC after the date of this prospectus supplement and accompanying prospectus, but excluding any information furnished to, rather than filed with, the SEC, will also be incorporated by reference into this prospectus supplement and deemed to be part of this prospectus supplement from the date of the filing of such reports and documents.

You may obtain a copy of any or all of the documents referred to above, which may have been or may be incorporated by reference into this prospectus supplement, including exhibits, at no cost to you by writing or telephoning us at the following address: Attention: Corporate Secretary, 5300 Memorial Drive, Suite 950, Houston, Texas 77007, telephone (713) 300-5160.

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\$75,000,000

## Moleculin Biotech, Inc.

Common Stock  
Preferred Stock  
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Warrants  
Units

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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.**

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**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 August 21, 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](http://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](http://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.

Holder 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 indentures 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.



**Common Stock**

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**PROSPECTUS SUPPLEMENT**

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July 23, 2019

**Oppenheimer & Co.**

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