

Moleculin Biotech, Inc.
5300 Memorial Drive , Suite 950
Houston, TX 77007
(713) 300-5160

To the Stockholders of Moleculin Biotech, Inc.:

You are cordially invited to attend the Annual Meeting of Stockholders of Moleculin Biotech, Inc. on May 22, 2019. The Annual Meeting will begin at 1:30 p.m. local time at the corporate offices of Moleculin Biotech, Inc., 5300 Memorial Drive, Suite 950, Houston, TX 77007.

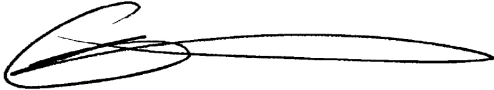
Information regarding each of the matters to be voted on at the Annual Meeting is contained in the attached Proxy Statement and Notice of Annual Meeting of Stockholders. We urge you to read the proxy statement carefully. The proxy statement and proxy card are being mailed to all stockholders of record as of April 1, 2019.

Because it is important that your shares be voted at the Annual Meeting, we urge you to complete, date and sign the enclosed proxy card and return it as promptly as possible in the accompanying envelope, whether or not you plan to attend in person. Even after returning your proxy, if you are a stockholder of record and do attend the meeting and wish to vote your shares in person, you still may do so.

We look forward to seeing you on May 22, 2019.

Very truly yours,

MOLECULIN BIOTECH, INC.



Walter Klemp
Chairman of the Board and Chief Executive
Officer

**Important Notice Regarding the Availability of Proxy Materials
for the Annual Shareholder Meeting to be Held on May 22, 2019:**

Electronic Copies of the Proxy Statement and our 2018 Annual Report on Form 10-K are available at
<https://materials.proxyvote.com/60855D>

5300 Memorial Drive, Suite 950
Houston, TX 77007
(713) 300-5160

NOTICE OF ANNUAL MEETING OF STOCKHOLDERS

To Be Held May 22, 2019

TO THE STOCKHOLDERS OF MOLECULIN BIOTECH, INC.:

NOTICE IS HEREBY GIVEN that the 2019 Annual Meeting of Stockholders of Moleculin Biotech, Inc. (the "Company") will be held at the corporate offices at 5300 Memorial Drive, Suite 950, Houston, TX 77007, on May 22, 2019 at 1:30 p.m., local time, for the following purposes, as described in the accompanying Proxy Statement:

1. To elect four Board nominees to the Board of Directors of the Company, each to serve until the 2020 annual meeting of stockholders of the Company or until such person's successor is qualified and elected.
2. To ratify the appointment of Grant Thornton, LLP as the Company's independent registered public accounting firm for the year ending December 31, 2019.
3. To approve an amendment to the Company's amended and restated certificate of incorporation to effect a reverse stock split of the outstanding shares of the Company's common stock, at one of the following reverse stock split ratios, 1-for-2, 1-for-3, 1-for-4, 1-for-5, 1-for-6 or 1-for-7, as determined by the Board of Directors in its sole discretion, prior to the one-year anniversary of this Annual Meeting.
4. To approve an amendment to the Company's amended and restated certificate of incorporation to increase the total number of authorized shares of common stock from 75,000,000 shares to 100,000,000 shares.
5. To approve, for purposes of complying with Nasdaq Listing Rule 5635(d), the issuance of more than 20% of the Company's issued and outstanding common stock pursuant to the Company's purchase agreement with Lincoln Park Capital Fund, LLC.
6. To authorize the adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes at the time of the Annual Meeting or adjournment or postponement thereof to approve of the foregoing proposals.
7. To transact any other business that is properly brought before the Annual Meeting or any adjournment or postponement thereof.

Only stockholders of record of the Company at the close of business on April 1, 2019 are entitled to notice of and to vote at the Annual Meeting or any adjournment or postponement thereof. A complete list of these stockholders will be open for the examination of any stockholder of record at the Company's principal executive offices located at 5300 Memorial Drive, Suite 950, Houston, TX 77007 for a period of ten days prior to the Annual Meeting. The list will also be available for the examination of any stockholder of record present at the Annual Meeting. The Annual Meeting may be adjourned or postponed from time to time without notice other than by announcement at the meeting.

WHETHER OR NOT YOU PLAN TO ATTEND THE MEETING, PLEASE SIGN AND DATE THE ENCLOSED PROXY AND RETURN IT IN THE ENVELOPE PROVIDED.

By Order of the Board of Directors,
MOLECULIN BIOTECH, INC.



Walter V. Klemp
Chairman of the Board and Chief Executive Officer

Houston, Texas
April 22, 2019

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MOLECULIN BIOTECH, INC.
PROXY STATEMENT
FOR
ANNUAL MEETING OF STOCKHOLDERS
To Be Held May 22, 2019

INFORMATION ABOUT THE ANNUAL MEETING AND VOTING

WHY DID YOU SEND ME THIS PROXY STATEMENT?

This proxy statement and the enclosed proxy card are furnished in connection with the solicitation of proxies by the Board of Directors of Moleculin Biotech, Inc., a Delaware corporation, for use at the Annual Meeting of Moleculin Biotech Inc's stockholders to be held at the 5300 Memorial Drive, Suite 950, Houston, TX 77007, on May 22, 2019 at 1:30 p.m., local time, and at any adjournments or postponements of the Annual Meeting. This proxy statement summarizes the information you need to make an informed vote on the proposals to be considered at the Annual Meeting. However, you do not need to attend the Annual Meeting to vote your shares. Instead, you may simply complete, sign and return the enclosed proxy card using the envelope provided. The terms "Moleculin," "Company," "we," or "our" refer to Moleculin Biotech, Inc.

WHAT PROPOSALS WILL BE ADDRESSED AT THE ANNUAL MEETING?

We will address the following proposals at the Annual Meeting:

1. To elect four Board nominees to the Board of Directors of the Company, each to serve until the 2020 annual meeting of stockholders of the Company or until such person's successor is qualified and elected.
2. To ratify the appointment of Grant Thornton, LLP as the Company's independent registered public accounting firm for the year ending December 31, 2019.
3. To approve an amendment to the Company's amended and restated certificate of incorporation to effect a reverse stock split of the outstanding shares of the Company's common stock, at one of the following reverse stock split ratios, 1-for-2, 1-for-3, 1-for-4, 1-for-5, 1-for-6 or 1-for-7, as determined by the Board of Directors in its sole discretion, prior to the one-year anniversary of this Annual Meeting.
4. To approve an amendment to the Company's amended and restated certificate of incorporation to increase the total number of authorized shares of common stock from 75,000,000 shares to 100,000,000 shares.
5. To approve, for purposes of complying with Nasdaq Listing Rule 5635(d), the issuance of more than 20% of the Company's issued and outstanding common stock pursuant to the Company's purchase agreement with Lincoln Park Capital Fund, LLC.
6. To authorize the adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes at the time of the Annual Meeting or adjournment or postponement thereof to approve any of the foregoing proposals
7. To transact any other business that is properly brought before the Annual Meeting or any adjournment or postponement thereof.

WHO MAY VOTE ON THESE PROPOSALS?

We will send this proxy statement, the attached Notice of Annual Meeting and the enclosed proxy card on or about April 22, 2019 to all stockholders as of April 1, 2019 (the "Record Date"). Stockholders who owned shares of our common stock at the close of business on the Record Date are entitled to vote at the Annual Meeting on all matters properly brought before the Annual Meeting.

On the Record Date, we had 34,384,030 shares of issued and outstanding common stock entitled to vote at the Annual Meeting.

HOW MANY VOTES DO I HAVE?

Each share of common stock is entitled to one vote on each matter presented at the Annual Meeting. Cumulative voting is not permitted.

WHY WOULD THE ANNUAL MEETING BE POSTPONED?

The Annual Meeting will be postponed if a quorum is not present on May 22, 2019. The presence in person or by proxy of at least a majority of our common stock outstanding as of the Record Date will constitute a quorum and is required to transact business at the Annual Meeting. If a quorum is not present, the Annual Meeting may be adjourned until a quorum is obtained.

Abstentions and broker non-votes are treated as shares present or represented at the meeting, but are not counted as votes cast. Shares held by brokers who do not have discretionary authority to vote on a particular matter and who have not received voting instructions from their customers are not counted or deemed to be present or represented for the purpose of determining whether stockholders have approved that matter, but they are counted as present for the purposes of determining the existence of a quorum at the Annual Meeting.

HOW DO I VOTE BY PROXY?

Whether you plan to attend the Annual Meeting or not, we urge you to complete, sign and date the enclosed proxy card and return it promptly in the envelope provided. Returning the proxy card will not affect your right to attend the Annual Meeting and vote in person.

If you properly fill in your proxy card and send it to us in time to vote, your proxy (one of the individuals named on your proxy card) will vote your shares as you have directed. If you sign the proxy card but do not make specific choices, your proxy will vote your shares as recommended by the Board of Directors ("the Board") as follows:

1. FOR the election of the Board's four nominees to our Board of Directors.
2. FOR ratification of the appointment of Grant Thornton, LLP as our independent registered public accounting firm for the year ending December 31, 2019.
3. FOR approval of an amendment to the Company's amended and restated certificate of incorporation to effect a reverse stock split of the outstanding shares of the Company's common stock, at one of the following reverse stock split ratios, 1-for-2, 1-for-3, 1-for-4, 1-for-5, 1-for-6 or 1-for-7, as determined by the Board of Directors in its sole discretion, prior to the one-year anniversary of this Annual Meeting.
4. FOR approval of an amendment to the Company's amended and restated certificate of incorporation to increase the total number of authorized shares of common stock from 75,000,000 shares to 100,000,000 shares.
5. FOR approval, for purposes of complying with Nasdaq Listing Rule 5635(d), of the issuance of more than 20% of the Company's issued and outstanding common stock pursuant to the Company's purchase agreement with Lincoln Park Capital Fund, LLC.
6. FOR authorization of an adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes at the time of the Annual Meeting or adjournment or postponement thereof to approve any of the foregoing proposals

If any other matters are presented, your proxy will vote in accordance with his or her best judgment. At the time this proxy statement was printed, we knew of no matters that needed to be acted on at the Annual Meeting other than those discussed in this proxy statement.

HOW DO I VOTE IN PERSON?

If you plan to attend the Annual Meeting and vote in person on May 22, 2019, or at a later date if the meeting is adjourned or postponed, we will give you a ballot when you arrive. However, if your shares are held in the name of your broker, bank or other nominee, you must bring a power of attorney executed by the broker, bank or other nominee that owns the shares of record for your benefit and authorizing you to vote the shares.

MAY I REVOKE MY PROXY?

If you give a proxy, you may revoke it at any time before it is exercised. You may revoke your proxy in three ways:

1. You may send in another proxy with a later date.
2. You may notify us in writing (or if the stockholder is a corporation, under its corporate seal, by an officer or attorney of the corporation) at our principal executive offices before the Annual Meeting that you are revoking your proxy.
3. You may vote in person at the Annual Meeting.

WHAT VOTE IS REQUIRED TO APPROVE EACH PROPOSAL?

Proposal 1: Election of Directors.

A plurality of the eligible votes cast is required to elect director nominees, and as such, the four nominees who receive the greatest number of "For" votes cast by stockholders, entitled to vote at the meeting, will be elected. A nominee who receives a plurality means he or she has received more "For" votes than any other nominee for the same director's seat. Broker non-votes will have no effect on this proposal.

Proposal 2: Ratification of Appointment of Independent Registered Public Accounting Firm.

The approval of Proposal 2 requires the affirmative vote of a majority of the shares present in person or by proxy and entitled to vote on the matter. Broker non-votes will not be taken into account in determining the outcome of the proposal, and abstentions will be counted as votes against the proposal.

Proposal 3: Approval of an amendment to the Company's amended and restated certificate of incorporation to effect a reverse stock split as determined by the Board of Directors in its sole discretion.

The approval of Proposal 3 requires the affirmative vote of a majority of the Company's outstanding shares entitled to vote on the matter. Broker non-votes and abstentions will be counted as votes against the proposal.

Proposal 4: Approval of an amendment to the Company's amended and restated certificate of incorporation to increase the total number of authorized shares of common stock from 75,000,000 shares to 100,000,000 shares.

The approval of Proposal 4 requires the affirmative vote of a majority of the Company's outstanding shares entitled to vote on the matter. Broker non-votes and abstentions will be counted as votes against the proposal.

Proposal 5: Approval, for purposes of complying with Nasdaq Listing Rule 5635(d), of the issuance of more than 20% of the Company's issued and outstanding common stock pursuant to the Company's purchase agreement with Lincoln Park Capital Fund, LLC.

The approval of Proposal 5 requires the affirmative vote of a majority of the shares present in person or by proxy and entitled to vote on the matter. Broker non-votes will not be taken into account in determining the outcome of the proposal, and abstentions will be counted as votes against the proposal.

Proposal 6: Authorization of an adjournment of the Special Meeting.

The approval of Proposal 6 requires the affirmative vote of a majority of the shares present in person or by proxy and entitled to vote on the matter. Broker non-votes will not be taken into account in determining the outcome of the proposal, and abstentions will be counted as votes against the proposal.

Other Business That Is Properly Brought Before the Annual Meeting

If you do not give instructions to your bank or brokerage firm, it will nevertheless be entitled to vote your shares in its discretion on routine matters. However, absent your instructions, the record holder will not be permitted to vote your shares on a non-routine matter, which are referred to as "broker non-votes", properly brought before the meeting. Broker non-votes (shares held by brokers that do not have discretionary authority to vote on the matter and have not received voting instructions from their clients) are not counted or deemed to be present or represented for the purpose of determining whether stockholders have approved that proposal, but will be counted in determining whether there is a quorum present.

ARE THERE ANY RIGHTS OF APPRAISAL?

The Board of Directors is not proposing any action for which the laws of the State of Delaware, our certificate of incorporation or our bylaws provide a right of a stockholder to obtain appraisal of or payment for such stockholder's shares.

WHO BEARS THE COST OF SOLICITING PROXIES?

We will bear the cost of soliciting proxies in the accompanying form and will reimburse brokerage firms and others for expenses involved in forwarding proxy materials to beneficial owners or soliciting their execution.

WHERE ARE MOLECULIN'S PRINCIPAL EXECUTIVE OFFICES?

The principal executive offices of Moleculin are located at 5300 Memorial Drive, Suite 950, Houston, TX 77007 and our telephone number is (713) 300-5160.

HOW CAN I OBTAIN ADDITIONAL INFORMATION ABOUT MOLECULIN?

We are subject to the informational requirements of the Securities Exchange Act of 1934, as amended, which requires that we file reports, proxy statements and other information with the SEC. The SEC maintains a website that contains reports, proxy and information statements and other information regarding companies, including Moleculin, that file electronically with the SEC. The SEC's website address is www.sec.gov. In addition, our filings may be inspected and copied at the public reference facilities of the SEC located at 100 F Street, N.E. Washington, DC 20549.

STOCK OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth information, as of April 1, 2019, regarding beneficial ownership of our common stock by:

- each of our directors;
- each of our executive officers;
- all directors and executive officers as a group; and
- each person, or group of affiliated persons, known by us to beneficially own more than five percent of our shares of common stock.

Beneficial ownership is determined according to the rules of the SEC, and generally means that person has beneficial ownership of a security if he or she possesses sole or shared voting or investment power of that security and includes options that are currently exercisable or exercisable within 60 days. Each director or officer, as the case may be, has furnished us with information with respect to beneficial ownership. Except as otherwise indicated, we believe that the beneficial owners of common stock listed below, based on the information each of them has given to us, have sole investment and voting power with respect to their shares, except where community property laws may apply. Except as otherwise noted below, the address for each person or entity listed in the table is c/o Moleculin Biotech, Inc., 5300 Memorial Drive, Suite 950, Houston, Texas 77007.

Name and Address of Beneficial Owner	Shares beneficially owned	Percent of Class (1)
Walter V. Klemp	2,477,724 (2)	7.2%
Donald Picker	1,113,635 (3)	3.2%
Jonathan P. Foster	246,250 (4)	Less than 1%
Robert George	19,333 (5)	Less than 1%
Michael Cannon	18,333 (6)	Less than 1%
John Climaco	6,667 (6)	—
Directors and Named Executive Officers as a Group (8 persons)	3,881,942 (7)	11.2%
5% or greater shareholders		
Waldemar Priebe	4,040,573 (8)	11.8%
AnnaMed, Inc.	1,425,000 (9)	4.1%

(1) Based on 34,384,030 shares of common stock outstanding as of April 1, 2019.

(2) Includes 1,425,000 shares held by AnnaMed, Inc. that have been included in the amount for Mr. Klemp. Mr. Klemp has voting and dispositive power over the shares held by AnnaMed, Inc. Includes 85,000 shares underlying options exercisable within 60 days of the Record date.

(3) Of the amount in the table, 630,000 shares held by IntertechBio Corp. have been included in the amounts for Drs. Picker and Priebe. Drs. Picker and Priebe have voting and dispositive power over the shares held by IntertechBio Corp. Includes 15,000 shares underlying options exercisable within 60 days of the Record Date.

(4) Includes 236,250 shares underlying options exercisable within 60 days of the Record Date.

(5) Includes 18,333 shares underlying options exercisable within 60 days of the Record Date.

(6) Consists solely of shares underlying options exercisable within 60 days of the Record Date.

(7) Consists of the shares identified in footnotes (2)-(6).

(8) Of the amount in the table, 629,000 shares held by Houston Pharmaceuticals, Inc. have been included in the amount for Dr. Priebe. Dr. Priebe has voting and dispositive power over the shares held by Houston Pharmaceuticals, Inc. Of the amount in the table, 630,000 shares held by IntertechBio Corp. have been included in the amounts for Drs. Picker and Priebe. Drs. Picker and Priebe have voting and dispositive power over the shares held by IntertechBio Corp.

(9) Mr. Klemp has voting and dispositive power over the shares held by AnnaMed, Inc.

SECTION 16(A) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Section 16(a) of the Securities Exchange Act of 1934, as amended, requires our executive officers and directors, and persons who own more than ten percent of our common stock, to file reports of ownership and changes in ownership of our common stock with the SEC. Officers, directors, and greater-than-ten-percent stockholders are required by the SEC's regulations to furnish us with copies of all Section 16(a) forms that they file. Based solely upon a review of the Section 16(a) forms furnished to us during the most recent fiscal year, we believe that all such forms required to be filed were timely filed, by the officers, directors, and security holders required to file the forms during the fiscal year ended December 31, 2018.

INFORMATION ABOUT DIRECTORS AND EXECUTIVE OFFICERS

Directors and Executive Officers

The following table sets forth the names and ages of all of our directors and executive officers as of April 1, 2019. Our officers are appointed by, and serve at the pleasure of, the Board of Directors.

Name	Age	Position
Walter V. Klemp	59	Chairman of the Board, President and Chief Executive Officer
Jonathan P. Foster	55	Chief Financial Officer and Executive Vice President
Donald Picker	73	Chief Scientific Officer
Robert Shepard	66	Chief Medical Officer
Sandra L. Silberman	64	Chief Medical Officer — New Products
Robert E. George	69	Director
Michael D. Cannon	73	Director
John Climaco	50	Director

Set forth below is biographical information about each of the individuals named in the tables above:

Walter V. Klemp - Chairman of the Board, President and Chief Executive Officer. Mr. Klemp is a co-founder of our company, and has served as our chairman of the board and part-time chief executive officer since July 2015 and as president since August 2017. Since 2006, Mr. Klemp has served as the chairman, co-founder and part-time chief executive officer of Moleculin, LLC. Since August 2018, Mr. Klemp has also serves as executive chairman of the board of directors of Soliton, Inc., a medical device company focused on developing new technology for use in aesthetics, from November 2011 to August 2018. Mr. Klemp served as president and chief executive officer of Zeno Corporation from 2004 to April 2011, where he developed and marketed dermatology devices and drugs from concept through FDA approval and market launch. From 1987 to 2000, Mr. Klemp served as chief executive officer and chairman of Drypers Corporation, a publicly traded multinational consumer products company that was listed as #1 on the INC 500 List of America’s Fastest Growing Companies. We believe that Mr. Klemp’s history with our company and background, coupled with his extensive experience in the medical field, provide him with the qualifications to serve as a Chairman of the Board and CEO.

Jonathan P. Foster - Chief Financial Officer and Executive Vice President. Mr. Foster has served as our chief financial officer and executive vice president since August 2016. Mr. Foster brings more than 30 years in financial experience holding a variety of executive and senior financial positions with public, private, and start-up to large corporate and international companies. Since June 2018, Mr. Foster serves as a member on the board of directors of Soliton, Inc., a medical device company focused on developing new technology for use in aesthetics. From February 2012 to August 2016, Mr. Foster served as Chief Financial Officer and Executive Vice President of InfuSystem Holdings, Inc., a national provider of infusion pumps and related services to the healthcare industry. From May 2011 to January 2012, Mr. Foster served as a consultant to the Chief Financial Officer of LSG Sky Chefs, USA, Inc., a subsidiary of Deutsche Lufthansa AG. Mr. Foster served on the Board of Financial Institutions for the State of South Carolina from 2006 to 2012. Mr. Foster is a Certified Public Accountant (South Carolina) and holds the designation of Chartered Global Management Accountant from the American Institute of Certified Public Accountants. He received his B.S. in Accounting from Clemson University in 1985. We believe that Mr. Foster’s history with our company and background, coupled with his experience in the accounting and finance profession, provide him with the qualifications to serve as Chief Financial Officer and Executive Vice President.

Donald Picker, PhD - Chief Scientific Officer. Dr. Picker has served as our chief scientific officer since August 2017 after serving as our chief operating officer from July 2015 until August 2017 and as our president from January 2016 to August 2017. His employment is on a part-time basis. In 2007, Dr. Picker became the chief executive officer of IntertechBio Corp. From 2006 through 2007, Dr. Picker was the President of Tapestry Pharmaceuticals. From 1998 to 2003, Dr. Picker was CEO of Synergy Pharmaceuticals. Synergy was merged into Callisto Pharmaceuticals where he was vice present of research and development until 2006. Dr. Picker led the development of carboplatin and cisplatin from concept to FDA approval. In 2018, Dr. Picker became an advisor to WPD Pharmaceuticals in Poland. From 2018 to 2019, Dr. Picker served on the board of directors of CNS Pharmaceuticals, Inc. Dr. Picker received his B.S. degree from Brooklyn Polytechnic University and his PhD from SUNY Albany in 1975. Dr. Picker is currently devoting only part of his work time to us, and provides services as needed to us.

Robert Shepard, MD, FACP, Chief Medical Officer. Dr. Shepard has served as our chief medical officer, on a part-time basis, since June 2016. From 2013 until 2014, Dr. Shepard served as vice president of scientific and medical affairs for Accelovance. Shepard has extensive research credentials in hematology and oncology and is board certified in oncology, hematology and internal medicine. He has a wide array of experience in translational medicine and clinical research and has been actively involved in oncology research since 1970, responsible for the clinical development of several drugs and immune therapies for biopharmaceutical companies, including serving as the consulting Chief Medical Officer for six companies. Dr. Shepard is a Magna Cum Laude graduate of Harvard University in biochemical sciences and molecular biophysics and studied in the Harvard-M.I.T. Health Sciences program. He held fellowships in hematology and oncology at the Tufts-New England Medical Center where he conducted laboratory

research in leukemias, myeloma and myelodysplasia, as well as fellowship in pharmacology and molecular genetics at the Dana-Farber Cancer Center and Harvard Medical School. Dr. Shepard holds academic appointments at Harvard University, Tufts University and the University of Virginia. Dr. Shepard is currently devoting only part of his work time to us, and provides services as needed to us.

Sandra L. Silberman, MD PhD - Chief Medical Officer - New Products. Dr. Silberman has served as our chief medical officer, on a part-time basis, for new products since November 2017. Dr. Silberman has served as chief medical officer of CNS Pharmaceuticals, Inc. since December 2017 on a part-time basis. In 2018, Dr. Silberman became an advisor to WPD Pharmaceuticals in Poland. Dr. Silberman has served as an Independent Consultant to the Biopharmaceutical Industry for the past four years. Dr. Silberman advanced several original, proprietary compounds into Phases I through Phase III clinical trials during her work with leading biopharmaceutical companies, including Bristol-Myers Squibb, AstraZeneca, Imclone and Roche. Dr. Silberman is a Hematologist/Oncologist who earned her B.A., Sc.M. and Ph.D. from the Johns Hopkins University School of Arts and Sciences, School of Public Health and School of Medicine, respectively, and her M.D. from Cornell University Medical College, and then completed both a clinical fellowship in Hematology/Oncology as well as a research fellowship in tumor immunology at the Brigham & Women's Hospital and the Dana Farber Cancer Institute in Boston, MA. Dr. Silberman is currently devoting only part of her work time to us and provides services as needed to us.

Robert E. George - Director. Mr. George joined our Board of Directors upon our IPO. He was a partner with the international accounting firm of PricewaterhouseCoopers (PWC) for 27 years until 2010, where his client service sectors included healthcare, among others. Mr. George currently serves as Chairman of the Audit Committee for The University of Texas Health Science Center at Houston and, since June 2011, has been a member of The University of Texas at Austin, McCombs Graduate School of Business accounting faculty. Mr. George graduated with accounting honors from the University of North Texas. We believe Mr. George's deep and broad level of expertise in financial accounting and reporting matters, particularly in the healthcare sector, as a former audit partner at PricewaterhouseCoopers provide him with the qualifications to serve as a director.

Michael D. Cannon - Director. Mr. Cannon joined our Board of Directors upon our IPO. Between 1997 and 2004, Mr. Cannon was the Chief Science Officer, EVP and a Director of SICOR, Inc., a U.S. public pharmaceutical company, until its acquisition by Teva Pharmaceutical Industries, Inc. SICOR focused on generic finished dosage injectable pharmaceuticals, active pharmaceutical ingredients and generic biopharmaceuticals. While at SICOR, he oversaw the acquisition and development of the biological business, including initiation and management of international partnerships, as well as on the design, construction, and licensure of protein manufacturing facilities. From July 2005 to December 2009, Mr. Cannon was a member of the scientific advisory board of Trevi Health Ventures LP, a New York investment fund specializing in health care investments. From May 2005 until December 2011, Mr. Cannon was a partner in a private partnership formed to evaluate and perform preliminary development of intellectual property in the healthcare sector. Since 2005, Mr. Cannon has served as a board member for several private companies. Mr. Cannon currently serves on the boards of directors of Athenex, Inc. and of three privately held biotech companies. He previously served on the board of directors of Athenex, Inc. a publicly company traded on the NASDAQ. Mr. Cannon has a degree in chemistry from Fordham College. We believe Mr. Cannon's distinguished career in the biotechnology field, particularly as Chief Science Officer, EVP and a Director of SICOR, a publicly traded company, provide him with the qualifications to serve as a director.

John M. Climaco, Esq. - Director. Mr. Climaco joined our Board of Directors in July 2017. Mr. Climaco has served as the chief executive officer of CNS Pharmaceuticals, Inc. since September 2017. Mr. Climaco has served in leadership roles in a variety of healthcare companies. From 2014 until 2017, Mr. Climaco served as the Executive Vice-President of Perm-Fix Medical S.A. From 2002 until 2012, Mr. Climaco served as President and CEO of Axial Biotech, Inc., a DNA diagnostics company. Mr. Climaco currently serves as a director of Digirad, Inc., a leading national provider of imaging services, and Birner Dental Management Services, Inc., a provider of practice management services to the dental industry. Mr. Climaco previously served as a director of PDI, Inc., a provider of outsourced commercial services to pharma companies, and InfuSystem Holdings, Inc., the largest supplier of infusion services to oncologists in the United States and Birner Dental Management Services, Inc., a provider of practice management services to the dental industry. Mr. Climaco obtained his Juris Doctorate Degree from University of California Hastings College of Law, San Francisco, CA and a Bachelors of Philosophy from Middlebury College, Middlebury, VT. Mr. Climaco is active with the State Bar of Utah. We believe Mr. Climaco's vast experience with development stage companies and his legal background provides him with the qualifications to serve as a director.

No director is related to any other director or executive officer of our company or our subsidiaries, and, there are no arrangements or understandings between a director and any other person pursuant to which such person was elected as director.

GOVERNANCE OF THE COMPANY

Our Board of Directors

Our Board of Directors oversees the business affairs of Moleculin and monitors the performance of management. Pursuant to our Bylaws, the Board of Directors shall consist of no less than one director. Members of the Board of Directors discussed various business matters informally on numerous occasions throughout the year 2018. The Board held 16 meetings during 2018. Each incumbent director attended at least 75% of the total number of meetings of the Board of Directors and committee meetings of which such director was a member (held during the period for which such director was in office).

Director Independence

The rules of the Nasdaq Stock Market, or the Nasdaq Rules, require a majority of a listed company's board of directors to be composed of independent directors. In addition, the Nasdaq Rules require that, subject to specified exceptions, each member of a listed company's audit, compensation and nominating and governance committees be independent. Under the Nasdaq Rules, a director will only qualify as an independent director if, in the opinion of our Board of Directors, that person does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. The Nasdaq Rules also require that audit committee members satisfy independence criteria set forth in Rule 10A-3 under the Securities Exchange Act of 1934, as amended, or the Exchange Act. In order to be considered independent for purposes of Rule 10A-3, a member of an audit committee of a listed company may not, other than in his or her capacity as a member of the audit committee, the board of directors, or any other board committee, accept, directly or indirectly, any consulting, advisory, or other compensatory fee from the listed company or any of its subsidiaries or otherwise be an affiliated person of the listed company or any of its subsidiaries. In considering the independence of compensation committee members, the Nasdaq Rules require that our board of directors must consider additional factors relevant to the duties of a compensation committee member, including the source of any compensation we pay to the director and any affiliations with our company.

Our board of directors undertook a review of the composition of our board of directors and its committees and the independence of each director. Based upon information requested from and provided by each director concerning his background, employment and affiliations, including family relationships, our board of directors has determined that each of our directors, with the exception of Mr. Klemp, are independent as defined under the Nasdaq Rules.

Board Committees

We established a Nominating and Corporate Governance Committee, an Audit Committee and a Compensation Committee. Our Board of Directors has adopted and approved a charter for each of these standing committees. The charters, which include the functions and responsibilities of each of the committees, can be found in the "Investors - Corporate Governance" section on our web site at www.moleculin.com.

Audit Committee. The members of the Audit Committee are Robert George (Chairperson), Michael Cannon and John Climaco. Each member of the Audit Committee is independent as defined by the Nasdaq Rules. In addition, each member of the Audit Committee satisfies the additional requirements of the SEC and Nasdaq Rules for audit committee membership, including the additional independence requirements and the financial literacy requirements. The Board has determined that at least one member of the Audit Committee, Mr. George, is an "audit committee financial expert" as defined in the SEC's rules and regulations. The primary purpose of the Audit Committee is to oversee the quality and integrity of our accounting and financial reporting processes and the audit of our financial statements. The Audit Committee is responsible for selecting, compensating, overseeing and terminating the selection of our independent registered public accounting firm.

Nominating and Corporate Governance Committee. The members of the Nominating and Corporate Governance Committee are Robert George (Chairperson), Michael Cannon and John Climaco. Each member of the Nominating and Corporate Governance Committee is independent as defined by Nasdaq Rules. The primary functions and responsibilities of the Nominating and Corporate Governance Committee are to: (a) determine the qualifications, qualities, skills, and other expertise required to be a director; (b) identify and screen individuals qualified to become members of the Board; (c) make recommendations to the Board regarding the selection and approval of the nominees for director; and (d) review and assess the adequacy of our corporate governance policies and procedures.

Compensation Committee. The members of the Compensation Committee are Michael Cannon (Chairperson), Robert George and John Climaco. Each member of the Compensation Committee is independent as defined by Nasdaq Rules.

The Compensation Committee is responsible for, among other things, reviewing and making recommendations to the Board of Directors with respect to the annual compensation for our Chief Executive Officer. The Compensation Committee also is responsible for reviewing and making recommendations to the Board of Directors the annual compensation and benefits for our other executive officers. The Compensation Committee also, among other things, reviews compensation of the Board, reviews and makes recommendations on all new executive compensation programs that are proposed for adoption and administers the Company's

equity incentive plans. The Compensation Committee is responsible for reviewing director compensation for service on the Board and Board committees at least once a year and to recommend any changes to the Board.

Our Chief Executive Officer reviews the performance of our other executive officers (other than himself) and, based on that review, our Chief Executive Officer makes recommendations to the Compensation Committee about the compensation of executive officers (other than himself). Our Chief Executive Officer does not participate in any deliberations or approvals by the Board or the Compensation Committee with respect to his own compensation.

Board Member Attendance at Annual Meetings

We do not have a formal policy regarding Board attendance at our annual meetings, however, all of our directors are invited to the annual meeting and all of our directors at the time attended our prior annual meeting.

Board Leadership Structure and Role in Risk Oversight

Walter Klemp serves as both our Chief Executive Officer and Chairman of the Board. Our Board of Directors has no policy with regard to the separation of the offices of Chairman of the Board and Chief Executive Officer, and believes, given the size of our company, it is appropriate for Mr. Klemp to serve in both roles.

John Climaco serves as the Lead Independent Director of our Board. As Lead Independent Director, Mr. Climaco is responsible for, among other things,

- leading executive sessions of the Board's independent directors;
- serving as the principal liaison between the Chairman and the independent directors; and
- approving all information sent to the Board of Directors and approving the agendas for all Board meetings.

Our Board believes that by maintaining a Lead Independent Director position, it has designed a governance structure that best advances Moleculin's objectives, while maintaining proper checks and balances on senior management, and providing the independent members of the Board with open and transparent communication regarding our strategic planning activities.

Our management is responsible for managing risks in our business, including developing processes to manage and monitor risks. The Board views its role as one of oversight. The Board focuses on understanding management's risk management systems, the effectiveness of those systems, and the way in which management proactively manages risks. In addition, the Board utilizes the Nominating and Corporate Governance Committee, the Audit Committee and the Compensation Committee to manage risks that arise under each committee's area of focus.

Nomination of Director Candidates

We receive suggestions for potential director nominees from many sources, including members of the Board, advisors, and stockholders. Any such nominations, together with appropriate biographical information, should be submitted to the Chairperson of the Nominating and Corporate Governance Committee in the manner discussed below. Any candidates submitted by a stockholder or stockholder group are reviewed and considered in the same manner as all other candidates.

Qualifications for consideration as a Board nominee may vary according to the particular areas of expertise being sought as a complement to the existing board composition. However, minimum qualifications include high level leadership experience in business activities, breadth of knowledge about issues affecting the Company, experience on other boards of directors, preferably public company boards, and time available for meetings and consultation on Company matters. Our Nominating and Corporate Governance Committee does not have a formal policy with regard to the consideration of diversity in identifying director candidates, but seeks a diverse group of candidates who possess the background, skills and expertise to make a significant contribution to the Board, to the Company and our stockholders. Candidates whose evaluations are favorable are recommended by our Nominating and Corporate Governance Committee to the full Board for consideration. The full Board selects and recommends candidates for nomination as directors for stockholders to consider and vote upon at the annual meeting.

A stockholder wishing to nominate a candidate for election to our Board of Directors at any annual meeting at which the Board of Directors has determined that one or more directors will be elected must submit a written notice of his or her nomination of a candidate to the Chairperson of the Nominating and Corporate Governance Committee (c/o the Corporate Secretary), providing the candidates name, biographical data and other relevant information together with a consent from the nominee. Pursuant to our Bylaws, the submission must be received at our principal executive offices 120 days prior to the anniversary date of the mailing date of our previous year's proxy statement so as to permit the Board of Directors time to evaluate the qualifications of the nominee.

We have not employed an executive search firm, or paid a fee to any other third party, to locate qualified candidates for director positions.

Stockholder Communications with Directors

Persons wishing to write to our Board of Directors, or to a specified director or committee of the Board, should send correspondence to the Corporate Secretary at 5300 Memorial Drive, Suite 950, Houston, Texas 77007. Electronic submissions of stockholder correspondence will not be accepted.

The Corporate Secretary will forward to the directors all communications that, in his or her judgment, are appropriate for consideration by the directors. Examples of communications that would not be appropriate for consideration by the directors include commercial solicitations and matters not relevant to the stockholders, to the functioning of the Board or to the affairs of Moleculin. Any correspondence received that is addressed generically to the Board of Directors will be forwarded to the Chairman of the Board.

Code of Ethics

We have adopted a written code of ethics that applies to our directors, principal executive officer, principal financial officer, principal accounting officer or controller and any persons performing similar functions. The code of ethics is on the “Investors - Corporate Governance - Governance Documents” section of our web site at www.moleculin.com. We intend to disclose any future amendments to, or waivers from, the code of ethics within four business days of the waiver or amendment through a website posting or by filing a Current Report on Form 8-K with the SEC.

COMPENSATION OF DIRECTORS AND EXECUTIVE OFFICERS

Executive Officer Compensation

Our named executive officers for the years ended December 31, 2018 and 2017, which consist of our principal executive officer and our two other most highly compensated executive officers, are: (i) Walter V. Klemp, our chairman, president and chief executive officer; (ii) Jonathan P. Foster, our chief financial officer and executive vice president; and (iii) Donald Picker, our chief scientific officer.

Summary Compensation Table - 2018

Name and Principal Position	Year	Salary (\$)	Bonus (\$)	Option awards (\$) (1)	All other compensation (\$) (2)	Total (\$)
Walter V. Klemp, Chairman, President - Chief Executive Officer (3)	2018	402,500	138,250	777,870	27,055	1,345,675
	2017	325,000	93,000	595,000	4,700	1,017,700
Jonathan P. Foster, Chief Financial Officer and Executive Vice President	2018	323,333	104,490	388,290	29,576	845,689
	2017	275,000	75,000	253,750	30,000	633,750
Donald Picker, Chief Scientific Officer	2018	254,167	54,510	96,750	33,980	439,407
	2017	225,000	50,000	105,000	25,000	405,000

(1) Represents the full grant date fair value of the option grant calculated in accordance with FASB ASC Topic 718. These amounts do not necessarily correspond to the actual value that may be realized by the named executive officer. For a summary of the assumptions made in the valuation of the awards, please see Note 6 to our financial statements as of and for the period ended December 31, 2018 included in the Form 10-K provided to you along with this proxy statement.

(2) Represents payments made by us for medical coverage, dental vision, short and long-term disability.

(3) Mr. Klemp’s employment agreement provided that Mr. Klemp would defer 50% of his salary for 12 months, or until June 1, 2017, which deferred salary will be payable upon the earlier of Mr. Klemp’s termination or on June 1, 2019. The amounts set forth in the table for 2017 consists of \$262,500 that was paid during the year and \$62,500 that represents the deferred portion of Mr. Klemp’s salary.

Explanation of Compensation Year; Base Salary; Option Awards

During 2017, we established for compensation purposes a compensation year from June 1 until May 31 of each year. In June of each year, our compensation committee completes its annual review of executive compensation and determines, after researching comparable companies and using a leading industry survey, the compensation arrangements for the next compensation year.

In June 2018, our compensation committee determined, for the 2018/2019 compensation year, to increase Mr. Klemp's base salary to \$440,000, that his targeted cash bonus for such year would be set at 55% of base compensation, and that his targeted option grant value for such compensation year would be set at \$800,000; provided that the cash bonus and option grants for the year are subject to Compensation Committee approval.

In June 2018, our compensation committee determined, for the 2018/2019 compensation year, to increase Mr. Foster's base salary to \$340,000, that his targeted cash bonus for such year would be set at 40% of base compensation, and that his targeted option grant value for such year would be set at \$315,000; provided that the cash bonus and option grants for the year are subject to Compensation Committee approval.

In June 2018, our compensation committee determined, for the 2018/2019 compensation year, that Dr. Picker's base salary would continue to be \$275,000, that his targeted cash bonus for such year would be set at 41% of base compensation, and that his targeted option grant value for such year would be set at \$100,000; provided that the cash bonus and option grants for the year are subject to Compensation Committee approval.

Each of the option awards granted to our employees, including all of our named executive officers, has an exercise price equal to fair market value of our common stock on the date of grant, a ten-year term, and vests in four equal annual installments.

Equity Awards

The following table sets forth certain information concerning our outstanding options for our named executive officers at December 31, 2018.

Outstanding Equity Awards At Fiscal Year-End—2018

Name	Grant Date of Equity Award	Number of Securities Underlying Unexercised Options (#) Exercisable (1)	Number of Securities Underlying Unexercised Options (#) Unexercisable (1)	Option Exercise Price (\$)	Option Expiration Date
Walter V. Klemp, Chairman, President - Chief Executive Officer	6/6/2018	—	603,000	1.82	6/6/2028
	10/3/2017	85,000	340,000	2.49	10/3/2027
Jonathan P. Foster, Chief Financial Officer and Executive Vice President	6/6/2018	—	301,000	1.82	6/6/2028
	10/3/2017	36,250	145,000	2.49	10/3/2027
	8/19/2016	200,000	200,000	5.85	8/19/2026
Donald Picker, Chief Scientific Officer	6/6/2018	—	75,000	1.82	6/6/2028
	10/3/2017	15,000	60,000	2.49	10/3/2027

(1) The shares underlying the options vest in equal annual installments over a four-year period (i.e., one-quarter of each grant vests on the first, second, third and fourth anniversary of the grant date).

Employment Agreements

Klemp Employment Agreement

On October 13, 2016, we entered into an employment agreement with Mr. Walter Klemp pursuant to which Mr. Klemp agreed to serve as our Chief Executive Officer commencing on such date. The agreement provided for an initial annual salary of \$300,000, provided that Mr. Klemp agreed to defer 50% of his salary for 12 months, which deferred salary will be payable upon the earlier of Mr. Klemp's termination or on June 1, 2019. Effective July 2018, our compensation committee agreed to increase Mr. Klemp's base salary to \$440,000.

If Mr. Klemp's employment is terminated at our election without "cause" (as defined in the agreement), which requires 30 days advanced notice, or by Mr. Klemp for "good reason" (as defined in the agreement), Mr. Klemp shall be entitled to receive severance payments equal to the greater of 12 months of Mr. Klemp's base salary or the base salary Mr. Klemp would have received had he remained employed through the third anniversary of the date of the agreement. Mr. Klemp has agreed not to compete with us for 12 months after the termination of his employment. If we determine to retain a new chief executive officer during the term of the agreement, we have the option, at our discretion, to convert Mr. Klemp into a consultant on the same terms as set forth above.

Foster Employment Agreement

On August 19, 2016, we entered into an employment agreement with Mr. Jonathan P. Foster pursuant to which Mr. Foster agreed to serve as our Chief Financial Officer and Executive Vice President commencing on such date for an initial term of three years, which will be automatically renewed for additional one-year terms unless either party chooses not to renew the agreement. The agreement provided for an initial annual salary of \$250,000. Effective June 2018, our compensation committee agreed to increase Mr. Foster's base salary to \$340,000. Mr. Foster may receive an annual bonus, provided that the final determination on the amount of the annual bonus, if any, will be made by the Compensation Committee of the Board of Directors, based on criteria established by the Compensation Committee.

Under the agreement, Mr. Foster was granted a ten-year option to purchase 400,000 shares at an exercise price per share equal to the closing price of our common stock on the date of execution of his employment agreement, which was \$5.85. The option vests in four equal installments (or 100,000 shares each installment) on each of the succeeding four anniversary dates of the execution of the agreement, provided Mr. Foster is Chief Financial Officer on such vesting date. In the event of a "change of control" (as

defined in the agreement) prior to the final vesting of all of the options, all of the unvested options shall immediately vest; provided, however, in the event the acquiring party desires to replace the unvested options with a substitute grant of equal or greater value, such proposed substitution shall be submitted to the Compensation Committee, and the Compensation Committee shall decide whether to allow the unvested options to vest or whether to cancel the unvested options and replace them with the substitute grant proposed by the acquiring party.

If Mr. Foster’s employment is terminated at our election without “cause” (as defined in the agreement), which requires 90 days advance notice, or by Mr. Foster for “good reason” (as defined in the agreement), Mr. Foster shall be entitled to receive severance payments equal to nine months of Mr. Foster’s base salary and a pro rata portion of the target bonus, if any, for the year in which such termination occurs. In addition, if Mr. Foster’s employment is terminated prior to the end of the term of the agreement by us without cause or by Mr. Foster for good reason, and such termination occurs within three months prior to a change in control, in contemplation of a change in control or within six months after a change in control, Mr. Foster shall be entitled to receive, in addition to the severance discussed above, an acceleration of the vesting of the option grant described in the prior paragraph. Mr. Foster agreed not to compete with us until nine months after the termination of his employment.

Director Compensation

In April 2018, our compensation committee engaged Pay Governance LLC, an independent compensation consultant, to advise them on matters relating to our non-employee director compensation program. Based on a review of a compensation study prepared by Pay Governance, our compensation committee recommended to our Board and our Board approved the following policy for compensating non-employee members of the Board:

- Each non-employee director shall receive annual cash compensation of \$35,000. In addition, the chairperson of the Audit Committee, Compensation Committee and Nominating and Governance Committee shall receive an annual compensation of \$15,000, \$10,000 and \$7,500, respectively; the other members of such committees shall receive an annual compensation of \$7,500, \$5,000 and \$3,750, respectively; and the Lead Independent Director shall receive an annual compensation of \$15,000. All payments will be made within 15 days after calendar quarter end.

- Upon the initial appointment (or election) of non-employee directors to the Board, the director will be issued a 10-year option to purchase 40,000 shares of our common stock, under our 2015 Stock Plan, with 3-year annual vesting and an exercise price equal the closing price of our common stock on the date of the appointment (or election). Prior to April 2018, the initial appointment option grant consisted of an option to purchase 20,000 shares of common stock. Consistent with the Pay Governance compensation study, the Committee determined that the increase from 20,000 shares to 40,000 shares approximates the median initial appointment award value provided by a representative peer group of publicly traded companies. Correspondingly, each of our eligible non-employee directors received an additional 20,000 share option grant on the date of the 2018 annual meeting to adhere to the new initial appointment policy.

- Annually, on the date of our annual meeting, each non-employee director that is re-elected at the annual meeting will be issued, upon a motion and approval of the Board of Directors, a 10-year option to purchase 15,000 shares of our common stock, under our 2015 Stock Plan, with 3-year annual vesting and an exercise price equal the closing price of our common stock on the date of the annual meeting.

The following table sets forth the total compensation earned by our non-employee directors in 2018 (Mr. Klemp does not earn additional compensation for his services on the Board, and his compensation is fully reflected in the “-Summary Compensation Table” above):

Name	Year	Fees earned or paid in cash (\$)	Option awards (\$) (1)	Total (\$)
Michael D. Cannon	2018	\$ 56,250	\$ 44,450	\$ 100,700
Robert E. George	2018	\$ 62,500	\$ 44,450	\$ 106,950
John Climaco	2018	\$ 66,250	\$ 44,450	\$ 110,700

(1) Represents the full grant date fair value of the option award our board approved and granted to each non-employee director, calculated in accordance with FASB ASC Topic 718. These amounts do not necessarily correspond to the actual value that may be realized by the director. For a summary of the assumptions made in the valuation of the awards, please see Note 6 to our financial statements as of and for the period ended December 31, 2018 included in the Form 10-K provided to you along with this proxy statement. As of December 31, 2018, the aggregate number of shares outstanding under all options to purchase our

common stock held by our non-employee directors were: Mr. Cannon - 70,000 shares; Mr. George - 70,000 shares; and Mr. Climaco - 55,000 shares. None of our non-employee directors held stock awards other than options as of December 31, 2018.

Scientific Advisory Board

Our executive team is supported by our scientific advisory board, the members of which include scientists experienced in the fields in which we pursue.

Dr. Waldemar Priebe, Ph.D, Chair of Scientific Advisory Board (SAB). Waldemar Priebe is a founder of and one of the founding scientists at Moloculin, LLC and serves as Chairman of our Scientific Advisory Board. Dr. Priebe is also a Professor of Medicinal Chemistry at the Department of Experimental Therapeutics at The University of Texas MD Anderson Cancer Center. Dr. Priebe led the discovery of the molecules that form the basis for our lead drug candidates. As a founder or founding scientist at a number of successful biotechnology firms such as Aronex Pharmaceuticals, Houston Pharmaceuticals, Reata Pharmaceuticals, and IntertechBio, Dr. Priebe has been integral in advancing several drugs through the pipeline, three of which are currently in clinical development. He has also developed several new small molecule compounds that have been licensed as potential drugs.

Dr. John Paul Waymack, M.D., ScD, SAB Member. Dr. Waymack has served as CMO of Kitov Pharmaceuticals since July 2013. Dr. Waymack brings over 20 years' experience in the biopharma field. A former academic transplant surgeon and FDA medical officer, he has over 20 years' experience as a drug development consultant for major pharmaceutical companies, including Pfizer, Roche, Pharmacia, Warner Lambert and Searle. During his 10-year academic career, Dr. Waymack published over 100 scientific essays, mainly in the fields of prostaglandins and immunology. In addition, he was commissioned and served as a Major in the US Army Medical Corps in the position of Chief of Surgical Research at the Institute for Surgical Research. Dr. Waymack was also an Associate Professor of Surgery at the University of Texas Medical Branch and at the University of Medicine and Dentistry of New Jersey.

Dr. Jorge Cortes, M.D., SAB Member. Dr. Cortes is deputy chair and professor of medicine in the Department of Leukemia at MD Anderson Cancer Center where he directs the CML and AML Programs. Dr. Cortes received his medical degree in 1986 from the Universidad Nacional Autonoma de Mexico, and has been at MD Anderson since 1991. Dr. Cortes, whose clinical interest focuses on new drug development and the management of patients with myelodysplastic syndromes, acute and chronic leukemias, and myeloproliferative disorders has authored over 900 peer-reviewed medical publications in top-tier journals including New England Journal of Medicine, Lancet Oncology, Lancet Hematology, Journal of Clinical Oncology, Leukemia, Blood and many others. He has authored several books and book chapters in prestigious publications such as Cancer Medicine and Harrison's Principles of Internal Medicine. He has received numerous awards including the Faculty Scholar Award from MD Anderson in 2003, the Annual Celgene Young Investigator Achievement Award for Clinical Research in Hematology in 2005, The Dr. John J. Kenny Award from The Leukemia & Lymphoma Society in 2007, the Otis W. and Pearl L. Walters Faculty Achievement Award in Clinical Research from MD Anderson in 2007, The Professor David Galton Lecture from the Imperial College of London Hammersmith Hospital in London, UK in 2011, the William Randolph Hearst Foundations Faculty Achievement Award in Education in 2013, and The Gerald P. Bodey Award for Excellence in Education in 2014.

Dr. Elihu Estey, M.D., SAB Member. Dr. Estey is a Professor of Medicine in the Division of Hematology at the University of Washington School of Medicine and a Full Member and Director of AML Clinical Research (non-transplant) Clinical Research Division, Fred Hutchinson Cancer Research Center. Dr. Estey has built a distinguished career in cancer research approaching 40 years of active clinical practice with Acute Myeloid Leukemia ("AML") patients, providing mentorships for many physicians that have risen to prominence in AML, lectured globally to professional audiences on cancer research and published more than 700 articles on hematologic malignancies, specifically on AML. Additionally, Dr. Estey serves on the European Leukemia Net (ELN) guidelines committee for AML and has served as an advisor for AML studies to the Oncology Drugs Advisory Committee ("ODAC") of the U.S. Food and Drug Administration. Dr. Estey's contribution to science include: developed ATRA and Arsenic without chemotherapy for APL newly diagnosed patients, at MD Anderson; subsequently found to be superior to chemotherapy +ATRA, and now the widely accepted treatment for the disease; the first to develop and use FLAG-IDA (fludarabine containing regimen) in AML; and extensive reviewer of AML publications (Blood and JCO) and current Associate Editor of Leukemia. Dr. Estey's education includes an A.B. in Mathematics from Yale University in 1968 and an M.D. from Johns Hopkins University, Baltimore, MD in 1972. Additionally, Dr. Estey's training includes serving as an Intern in Medicine, New York University, Bellevue Medical Center, New York, NY from 1972-73; a Resident in Medicine, New York University, Bellevue Medical Center, New York, NY from 1973-76; a Chief Resident in Neurology, New York University, Bellevue Medical Center, New York, NY from 1976-78; and as a Fellow, Department of Developmental Therapeutics, University of Texas M.D. Anderson Hospital, Houston, TX from 1978-80.

Dr. James L. Abbruzzese, M.D., SAB Member. Dr. Abbruzzese is the Chief of the Division of Medical Oncology at Duke University, and Member of the Duke Cancer Institute at Durham, North Carolina. Abbruzzese earned his medical degree with honors from the University of Chicago Pritzker School of Medicine and completed his residency in Internal Medicine at Johns

Hopkins Hospital. He also completed clinical fellowships in Infectious Diseases at the Johns Hopkins and in Medical Oncology and Medical Oncology Research Laboratory of Neoplastic Disease Mechanisms at the Dana-Farber Cancer Institute of Harvard Medical School. Abbruzzese has spent most of his professional career at M.D. Anderson, where he rose through the ranks to his current leadership positions as Chairman of the Department of Gastrointestinal Medical Oncology and Associate Vice-Provost for Clinical Research. Among his many accomplishments, Abbruzzese is a Fellow of the American College of Physicians and Fellow of the American Society of Clinical Oncology. He has co-authored more than 400 research publications and currently serves as Chair of the Clinical Trials and Translational Research Advisory Committee of the National Cancer Institute.

We compensate the members of our Scientific Advisory Board, or SAB, based on our utilization of their time. As of the date hereof, we have entered into compensatory agreements with Drs. Waymack, Estey, Cortes and Abbruzzese pursuant to which we made a one-time grant of a 10-year option to purchase 10,000 shares of our common stock, under the Company's 2015 Stock Plan, with 4-year annual vesting and an exercise price equal to the closing price of our common stock on the date of the grant. In addition, we agreed to pay Dr. Waymack a fee of \$4,000 per month. We currently do not have any compensatory arrangements with Dr. Priebe.

RELATED PARTY TRANSACTIONS

Prior to our IPO, we merged with Moleculin, LLC. Moleculin, LLC was the holder of the license agreement with MD Anderson covering our WP 1066 Portfolio. In connection with the acquisition of Moleculin, LLC, we also negotiated on behalf of Moleculin, LLC two agreements with HPI. Drs. Priebe and Picker are shareholders of HPI, and Dr. Priebe has the voting and dispositive power over our shares held by HPI. Under the first agreement, HPI's option to obtain an exclusive sublicense was terminated in exchange for a payment of \$100,000 and the issuance of 629,000 shares of our common stock, valued at \$6 per share. Under the second agreement (HPI Out-Licensing Agreement), HPI has received a non-exclusive technology rights and development sublicense under which it may continue its ongoing work to research and develop the WP1066 Portfolio related to treatment of non-skin cancer. Pursuant to this HPI Out-Licensing Agreement, we agreed to make payments to HPI totaling \$750,000 over a three-year period. We expense such costs as incurred as research and development expense, commencing after the IPO offering in exchange for HPI allowing us to access any data, information or know-how resulting from the research and development conducted by HPI. Notwithstanding our obligation to make the foregoing payments, the HPI Out-Licensing Agreement does not obligate HPI to conduct any specific research or to meet any milestones. Pursuant to the HPI Out-Licensing Agreement, we have the right within three years of the effective date to buy-out from HPI all rights granted to HPI under the agreement for a payment of \$1.0 million. Upon our exercise of the buy-out we will no longer be obligated to make any payments to HPI remaining from the \$750,000 obligation discussed above. If we do not exercise the foregoing buy-out right within three years, the license granted to HPI shall convert into an exclusive license. As such, if we do not exercise the buy-out right for any reason, we will no longer have access to the non-skin cancer uses of the WP1066 Portfolio. As noted above, this will also potentially create risks for the development of skin cancer drugs.

We currently employ Lindsey Picker, the daughter of Don Picker, our president and chief operating officer, as a clinical research assistant on an at-will basis at an annual salary of \$75,000.

In February 2019, we entered into sublicense agreements with WPD Pharmaceuticals, Inc. and Animal Lifesciences, LLC. Dr. Priebe is affiliated with both WPD Pharmaceuticals, Inc. and Animal Lifesciences, LLC. For more information on the terms of these agreements, please see Item 1 - Business-Our Licensing Agreements in the Form 10-K you received along with this proxy statement. In addition, Dr. Picker and Dr. Silberman have in the past and may in the future perform consulting work for WPD Pharmaceuticals.

In August 2018, CNS Pharmaceuticals, Inc. entered into sublicense agreements with WPD Pharmaceuticals, Inc. and Animal Lifesciences, LLC pursuant to which CNS Pharmaceuticals, Inc. licensed the rights to their lead drug candidate, Berubicin, an anthracycline. Mr. Climaco is the chief executive officer of CNS Pharmaceuticals, Inc. and Dr. Silberman is the part-time chief medical officer for CNS Pharmaceuticals, Inc. In addition, Dr. Picker was previously a director of CNS Pharmaceuticals, Inc. Dr. Priebe is the majority shareholder of CNS Pharmaceuticals, Inc.

We have entered, and intend to continue to enter, into separate indemnification agreements with our directors and executive officers, in addition to the indemnification provided for in our amended and restated certificate of incorporation and bylaws. These agreements, among other things, require us to indemnify our directors and executive officers for certain expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by a director or executive officer in any action or proceeding arising out of their services as one of our directors or executive officers or as a director or executive officer of any other company or enterprise to which the person provides services at our request. We believe that these charter provisions and indemnification agreements are necessary to attract and retain qualified persons as directors and officers.

The limitation of liability and indemnification provisions in our amended and restated certificate of incorporation and amended and restated bylaws may discourage stockholders from bringing a lawsuit against directors for breach of their fiduciary duties. They may also reduce the likelihood of derivative litigation against directors and officers, even though an action, if successful, might benefit us and our stockholders. A stockholder's investment may decline in value to the extent we pay the costs of settlement and damage awards against directors and officers pursuant to these indemnification provisions.

Policies and Procedures for Related Party Transactions

Our audit committee charter provides that our audit committee is responsible for reviewing and approving in advance any related party transaction. This will cover, with certain exceptions set forth in Item 404 of Regulation S-K under the Securities Act, any transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships in which we were or will be a participant to, where the amount involved exceeds \$120,000 and a related person had or will have a direct or indirect material interest, including, without limitation, purchases of goods or services by or from the related person or entities in which the related person has a material interest, indebtedness, guarantees of indebtedness and employment by us of a related person. Related party transactions prior to our initial public offering were entered into prior to the creation of our audit committee and the adoption of this policy.

PROPOSAL 1: ELECTION OF DIRECTORS

Our Board of Directors currently consists of four members: Walter V. Klemp, Robert George, John Climaco and Michael Cannon. The Nominating and Governance Committee nominated and the Board approved and recommended all of the current members of our Board for re-election. All nominees have consented to being named herein and have indicated their intention to serve as our directors, if elected. The Board has no reason to believe that any nominee would be unable or unwilling to serve if elected. Unless authority to do so is withheld, the persons named as proxies will vote the shares represented by such proxies for the election of the named director nominees. In case any of the nominees becomes unavailable for election to the Board the persons named as proxies will have full discretion and authority to vote or refrain from voting for any other nominees in accordance with their judgment. The Board nominees, if elected, will serve until the next annual meeting of shareholders or until each successor is duly elected and qualified.

Biographical information for our directors is provided above in the section entitled "Information About Directors and Executive Officers."

Vote Required and Recommendation of the Board of Directors

A plurality of the eligible votes cast is required to elect director nominees, and as such, the four nominees who receive the greatest number of votes cast by stockholders, entitled to vote at the meeting, will be elected. A nominee who receives a plurality means he or she has received more votes than any other nominee for the same director's seat. Broker non-votes will have no effect on this proposal. **The Board recommends that stockholders vote FOR each of the four nominees for election to our Board of Directors.**

PROPOSAL 2: TO RATIFY THE APPOINTMENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Our Audit Committee has selected Grant Thornton LLP as our independent registered public accounting firm to audit our financial statements for the fiscal year ending December 31, 2019. Our stockholders are being asked to ratify this appointment. In the event that ratification of this selection of auditors is not approved by the stockholders, we will reassess our selection of auditors. Representatives of Grant Thornton LLP are expected to be present at the Annual Meeting, will be available to respond to appropriate questions, and will have the opportunity to make a statement at the Annual Meeting.

Change in independent registered public accounting firm

On February 21, 2017, our Audit Committee dismissed GBH CPAs, PC ("GBH") as its independent registered public accounting firm, effective as of such date.

The report of GBH on the Company's financial statements as of December 31, 2015 and for the period from July 28, 2015 (inception) to December 31, 2015 and the financial statements of Moleculin, LLC as of and for the years ended December 31, 2015 and 2014 did not contain an adverse opinion or disclaimer of opinion, and was not qualified or modified as to uncertainty, audit scope, or accounting principles, other than an explanatory paragraph relating to the Company's ability to continue as a going concern. During

the year ended December 31, 2015 and through February 21, 2017 there were no: (1) disagreements (as defined in Item 304(a)(1)(iv) of Regulation S-K and the related instructions to Item 304 of Regulation S-K) with GBH on any matter of accounting principles or practices, financial statement disclosure, or auditing scope or procedures, which disagreements, if not resolved to the satisfaction of GBH, would have caused GBH to make reference to the matter in its report on the financial statements for such year.

We requested that GBH furnish us with a letter addressed to the SEC stating whether it agrees with the above statements. A copy of such letter, dated February 22, 2017, was filed as exhibit 16.1 to the current report on Form 8-K we filed with the SEC on February 22, 2017.

On February 21, 2017, our Audit Committee approved the appointment of Grant Thornton LLP as the Company's independent registered public accounting firm for the fiscal year ended December 31, 2016.

During the period from July 28, 2015 (inception) to December 31, 2015, and through February 21, 2017, neither the Company nor anyone on their behalf consulted with Grant Thornton LLP with respect to either (i) the application of accounting principles to a specific transaction, either completed or proposed, or the type of audit opinion that might be rendered on the Company's financial statements, and neither written nor oral advice was provided to the Company that Grant Thornton LLP concluded was an important factor considered by the Company in reaching a decision as to any accounting, auditing or financial reporting issue; (ii) any matter that was either the subject of disagreement (as defined in Item 304(a)(1)(iv) of Regulation S-K and the related instructions to Item 304 of Regulation S-K) or a reportable event (as described in Item 304(a)(1)(v) of Regulation S-K).

Aggregate fees for professional services rendered by Grant Thornton, LLP for their services for the fiscal years ended December 31, 2018 and 2017, respectively, were as follows:

	2018	2017
Audit Fees	\$ 378,380	\$ 287,190
Audit-related fees	—	—
Tax fees	—	—
All other fees	27,852	—
TOTAL	\$ 406,232	\$ 287,190

Audit and Quarterly Review Fees

Audit fees represent the aggregate fees billed for professional services rendered by our independent accounting firm for the audit of our annual financial statements, review of financial statements included in our quarterly reports, review of registration statements or services that are normally provided in connection with statutory and regulatory filings or engagements for those fiscal years.

Audit-Related Fees

Audit-related fees represent the aggregate fees billed for assurance and related services that are reasonably related to the performance of the audit or review of our financial statements and are not reported under Audit Fees.

Tax Fees

Tax fees represent the aggregate fees billed for professional services rendered by our principal accountants for tax compliance, tax advice, and tax planning for such years.

All Other Fees

All other fees represent the aggregate fees billed for products and services other than the services reported in the other categories.

Audit Committee Pre-Approval Policies and Procedures

The Audit Committee on an annual basis reviews audit and non-audit services performed by the independent auditors. All audit and non-audit services are pre-approved by the Audit Committee, which considers, among other things, the possible effect of the performance of such services on the auditors' independence.

Vote Required and Recommendation of the Board of Directors

The approval of Proposal 2 requires the affirmative vote of a majority of the shares present in person or by proxy and entitled to vote on the matter. Broker non-votes will not be taken into account in determining the outcome of the proposal, and abstentions will be counted as votes against the proposal. **The Board recommends that stockholders vote FOR the ratification of the appointment of Grant Thornton, LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2019.**

AUDIT COMMITTEE REPORT

The Audit Committee assists the Board of Directors with its oversight responsibilities regarding the Company's financial reporting process. The Company's management is responsible for the preparation, presentation and integrity of the Company's financial statements and the reporting process, including the Company's accounting policies, internal control over financial reporting and disclosure controls and procedures. Grant Thornton LLP, the Company's independent registered public accounting firm, is responsible for performing an audit of the Company's financial statements.

We have reviewed and discussed with management and Grant Thornton LLP the Company's audited financial statements. We discussed with Grant Thornton LLP the overall scope and plans of their audit. We met with Grant Thornton LLP, with and without management present, to discuss the results of its examinations, its evaluation of the Company's internal controls, and the overall quality of the Company's financial reporting.

With regard to the fiscal year ended December 31, 2018, the Audit Committee (i) reviewed and discussed with management the Company's audited financial statements as of December 31, 2018, and for the year then ended; (ii) discussed with Grant Thornton LLP the matters required by Public Company Accounting Oversight Board (PCAOB) AS Section 1301, *Communications with Audit Committees*; (iii) received the written disclosures and the letter from Grant Thornton LLP required by applicable requirements of the PCAOB regarding Grant Thornton LLP's communications with the Audit Committee regarding independence; and (iv) discussed with Grant Thornton LLP their independence.

Based on the review and discussions described above, the Audit Committee recommended to the Company's Board of Directors that the Company's audited financial statements be included in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2018, for filing with the Securities and Exchange Commission.

Robert George (Chairperson)
Michael Cannon
John Climaco

PROPOSAL 3: APPROVAL OF AMENDMENT TO THE COMPANY'S AMENDED AND RESTATED CERTIFICATE OF INCORPORATION TO EFFECT REVERSE STOCK SPLIT OF THE COMPANY'S COMMON STOCK

General

Our Board is recommending that our stockholders approve a proposed amendment to our Amended and Restated Certificate of Incorporation in substantially the form attached hereto as Annex A, to effect a reverse stock split of our outstanding shares of common stock at one of the following reverse stock split ratios, 1-for-2, 1-for-3, 1-for-4, 1-for-5, 1-for-6 or 1-for-7, as determined by the Board of Directors in its sole discretion, at any time prior to the one-year anniversary of this Annual Meeting. If the stockholders approve and adopt the proposed amendment to effect the reverse stock split, and our Board decides to implement it, the reverse stock split will become effective on the date of the filing of the proposed amendment with the Secretary of State of the State of Delaware.

If implemented, the reverse stock split will be realized simultaneously for all outstanding common stock and the ratio determined by our Board will be the same for all outstanding shares of common stock. The reverse stock split will affect all holders of shares of our common stock uniformly and each stockholder will hold the same percentage of our common stock outstanding immediately following the reverse stock split as that stockholder held immediately prior to the reverse stock split, except for adjustments that may result from the treatment of fractional shares as described below. The proposed amendment will not reduce the number of authorized shares of common stock (which will remain at 75,000,000, unless Proposal 4 is approved in which case our authorized shares of common stock will be 100,000,000) or preferred stock (which will remain at 5,000,000) or change the par values of our common stock (which will remain at \$0.001 per share) or preferred stock (which will remain at \$0.001 per share).

Background

Our common stock is currently quoted on The NASDAQ Capital Market (“NASDAQ”), and we are therefore subject to its continued listing requirements, including requirements with respect to the market value of publicly-held shares, market value of listed shares, minimum bid price per share, and minimum stockholder's equity, among others, and requirements relating to board and committee independence. If we fail to satisfy one or more of the requirements, we may be delisted from NASDAQ.

The minimum closing bid price requirement set forth in NASDAQ Listing Rule 5550(a)(2) is \$1.00. If we fall below this threshold for a period of thirty consecutive business days, we will receive a notice from NASDAQ requiring we take actions to comply with the requirement within 180 days, by having the closing bid price of our common stock meet or exceed \$1.00 per share for at least ten consecutive business days. If we do not regain compliance, we would then be subject to delisting.

In May 2017, we received a notice that we were not in compliance with the \$1.00 minimum closing bid price requirement. On July 6, 2017, we received a letter from NASDAQ notifying us that we had regained compliance with the rule as a result of the closing bid price of our common stock being at \$1.00 per share or greater for the 10 consecutive business days from June 21, 2017 through July 5, 2017.

The closing price of our common stock on April 1, 2019 was \$0.89.

Purpose of the Proposed Reverse Stock Split

Our Board’s primary objective in proposing the reverse stock split is to raise the per share trading price of our common stock. In particular, this will help us to maintain the listing of our common stock on NASDAQ.

Delisting from NASDAQ may adversely affect our ability to raise additional financing through the public or private sale of equity securities, may significantly affect the ability of investors to trade our securities and may negatively affect the value and liquidity of our common stock. Delisting also could have other negative results, including the potential loss of employee confidence, the loss of institutional investors or interest in business development opportunities.

If we are delisted from NASDAQ and we are not able to list our common stock on another exchange, our common stock could be quoted on the OTC Bulletin Board or in the “pink sheets.” As a result, we could face significant adverse consequences including, among others:

- a limited availability of market quotations for our securities;
- a determination that our common stock is a “penny stock” which will require brokers trading in our common stock to adhere to more stringent rules and possibly result in a reduced level of trading activity in the secondary trading market for our securities;
- a limited amount of news and little or no analyst coverage for us;
- we would no longer qualify for exemptions from state securities registration requirements, which may require us to comply with applicable state securities laws; and
- a decreased ability to issue additional securities (including pursuant to short-form registration statements on Form S-3) or obtain additional financing in the future.

As of the Record Date, we were not in compliance with the NASDAQ bid price requirement. Our Board believes that the proposed reverse stock split is a potentially effective means for us to regain or maintain compliance with the listing rules of NASDAQ and to avoid, or at least mitigate, the likely adverse consequences of our common stock being delisted from the NASDAQ by producing the immediate effect of increasing the bid price of our common stock.

Increase the Market Price of our Common Stock to a Level More Appealing for Investors

We also believe that the reverse stock split could enhance the appeal of our common stock to the financial community, including institutional investors, and the general investing public. We believe that a number of institutional investors and investment funds are reluctant to invest in lower-priced securities and that brokerage firms may be reluctant to recommend lower-priced securities to their clients, which may be due in part to a perception that lower-priced securities are less promising as investments, are less liquid in the event that an investor wishes to sell its shares, or are less likely to be followed by institutional securities research firms and therefore more likely to have less third-party analysis of the Company available to investors. We believe that the reduction in the number of issued and outstanding shares of our common stock caused by the reverse stock split, together with the anticipated

increased stock price immediately following and resulting from the reverse stock split, may encourage interest and trading in our common stock and thus possibly promote greater liquidity for our stockholders, thereby resulting in a broader market for the common stock than that which currently exists.

We cannot assure you that all or any of the anticipated beneficial effects on the trading market for our common stock will occur. Our Board cannot predict with certainty what effect the reverse stock split will have on the market price of our common stock, particularly over the longer term. Some investors may view a reverse stock split negatively, which could result in a decrease in our market capitalization. Additionally, any improvement in liquidity due to increased institutional or brokerage interest or lower trading commissions may be offset by the lower number of outstanding shares. We cannot provide you with any assurance that our shares will continue to qualify for listing on NASDAQ. As a result, the trading liquidity of our common stock may not improve. In addition, investors might consider the increased proportion of unissued authorized shares to issued shares to have an anti-takeover effect under certain circumstances, since the proportion allows for dilutive issuances.

Determination of Ratio

The ratio of the reverse stock split, if approved and implemented, will be a ratio of 1-for-2, 1-for-3, 1-for-4, 1-for-5, 1-for-6 or 1-for-7, as determined by the Board of Directors in its sole discretion, prior to the one-year anniversary of this Annual Meeting. Even if approved, the Board will have discretion to delay or not to implement the reverse stock split.

In determining the reverse stock split ratio, our Board will consider numerous factors, including:

- the historical and projected performance of our common stock;
- general economic and other related conditions prevailing in our industry and in the marketplace;
- the projected impact of the selected reverse stock split ratio on trading liquidity in our common stock;
- our capitalization (including the number of shares of our common stock issued and outstanding);
- the prevailing trading price for our common stock and the volume level thereof; and
- potential devaluation of our market capitalization as a result of a reverse stock split.

The purpose of asking for authorization to amend the Amended and Restated Certificate of Incorporation to implement the reverse stock split at a ratio to be determined by the Board, as opposed to a ratio fixed in advance, is to give our Board the flexibility to take into account then-current market conditions and changes in price of our common stock and to respond to other developments that may be deemed relevant when considering the appropriate ratio.

Principal Effects of the Reverse Stock Split

A reverse stock split refers to a reduction in the number of outstanding shares of a class of a corporation's capital stock, which may be accomplished, as in this case, by reclassifying and combining all of our outstanding shares of common stock into a proportionately smaller number of shares. For example, if our Board decides to implement a 1-for-5 reverse stock split of our common stock, then a stockholder holding 10,000 shares of our common stock before the reverse stock split would instead hold 2,000 shares of our common stock immediately after the reverse stock split. The reverse stock split will affect all of our stockholders uniformly and will not affect any stockholder's percentage ownership interests in our company or proportionate voting power, except for minor adjustments due to the additional net share fraction that will need to be issued as a result of the treatment of fractional shares. No fractional shares will be issued in connection with the reverse stock split. Instead, we will issue one full share of the post-reverse stock split common stock to any stockholder who would have been entitled to receive a fractional share as a result of the process.

The principal effect of the reverse stock split will be that (i) the number of shares of common stock issued and outstanding will be reduced from 34,384,030 shares as of April 1, 2019 to a number of shares between and including one-half to one-seventh that amount, as the case may be based on the ratio for the reverse stock split as determined by our Board, and (ii) all outstanding options and warrants entitling the holders thereof to purchase shares of common stock will enable such holders to purchase, upon exercise of their options or warrants, as applicable, between and including one-half to one-seventh of the number of shares of common stock which such holders would have been able to purchase upon exercise of their options or warrants, as applicable, immediately preceding the reverse stock split at an exercise price equal to between and including two to five times the exercise price specified before the reverse stock split, resulting in essentially the same aggregate price being required to be paid therefor upon exercise thereof immediately preceding the reverse stock split, as the case may be based on the ratio for the reverse stock split as determined by our Board.

The following table, which is for illustrative purposes only, illustrates the effects of the reverse stock split at certain exchange ratios within the foregoing range, without giving effect to any adjustments for fractional shares of common stock, on our outstanding shares of common stock and authorized shares of capital stock as of April 1, 2019.

	Before Reverse Stock Split	After Reverse Stock Split					
		1-for-2	1-for-3	1-for-4	1-for-5	1-for-6	1-for-7
Common Stock Authorized (if Proposal 4 is not approved)	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000
Common Stock Authorized (if Proposal 4 is approved)	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000
Preferred Stock Authorized	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Common Stock Issued and Outstanding	34,384,030	17,192,015	11,461,343	8,596,008	6,876,806	5,730,672	4,912,004
Common Stock Underlying Options and Warrants	9,571,013	4,785,507	3,190,338	2,392,753	1,914,203	1,595,169	1,367,288
Common Stock Available for Grant under 2015 Stock Equity Plan	1,706,000	853,000	568,667	426,500	341,200	284,333	243,714
Total Common Stock Authorized but Unreserved (if Proposal 4 is not approved)	29,338,957	52,169,478	59,779,652	63,584,739	65,867,791	67,389,826	68,476,994
Total Common Stock Authorized but Unreserved (if Proposal 4 is approved)	54,338,957	77,169,478	84,779,652	88,584,739	90,867,791	92,389,826	93,476,994

The amendment will not change the terms of our common stock. The shares of new common stock will have the same voting rights and rights to dividends and distributions and will be identical in all other respects to the common stock now authorized. The common stock issued pursuant to the reverse stock split will remain fully paid and non-assessable. The reverse stock split is not intended as, and will not have the effect of, a “going private transaction” covered by Rule 13e-3 under the Securities Exchange Act of 1934, as amended (the “Exchange Act”). We will continue to be subject to the periodic reporting requirements of the Exchange Act.

Accounting Matters

The reverse stock split will not affect the par value of our common stock. As a result, on the effective date of the reverse stock split, the stated capital on our balance sheet attributable to the common stock will be reduced to between and including one-half to one-fifth of its present amount, as the case may be based on the ratio for the reverse stock split as determined by our Board, and the additional paid-in capital account shall be credited with the amount by which the stated capital is reduced. The per share net loss and net book value of our common stock will be retroactively increased for each period because there will be fewer shares of our common stock outstanding.

Effect of Authorized but Unissued Shares

The reverse stock split will have the effect of significantly increasing the number of authorized but unissued shares of common stock. The number of authorized shares of common stock will not be decreased and will remain at 75,000,000 (unless Proposal 4 is approved in which case our authorized shares of common stock will be 100,000,000). Because the number of outstanding shares will be reduced as a result of the reverse stock split, the number of shares available for issuance will be increased. See the table above under the caption “Principal Effects of the Reverse Stock Split” that shows the number of unreserved shares of common stock that would be available for issuance at various reverse stock split ratios.

Our Board believes that we will need to raise additional capital in the ordinary course of business. In addition, we may issue shares to acquire other companies or assets or engage in business combination transactions. As of the date of this Proxy Statement, we have no specific plans, arrangements or understandings, whether written or oral, with respect to the increase in shares available for issuance as a result of the reverse stock split.

Potential Anti-Takeover and Dilutive Effects

The purpose of the reverse stock split is not to establish any barriers to a change of control or acquisition of the Company. However, because the number of authorized shares of common stock will remain at 75,000,000 (unless Proposal 4 is approved in which case our authorized shares of common stock will be 100,000,000), this proposal, if adopted and implemented, will result in a relative increase in the number of authorized but unissued shares of our common stock as compared to the outstanding shares of our common stock and could, under certain circumstances, have an anti-takeover effect. Shares of common stock that are authorized but unissued provide our Board with flexibility to effect, among other transactions, public or private financings, mergers, acquisitions, stock dividends, stock splits and the granting of equity incentive awards. However, these authorized but unissued shares may also be used by our Board, consistent with and subject to its fiduciary duties, to deter future attempts to gain control of us or make such actions more expensive and less desirable. After implementation of the proposed amendment, our Board will continue to have authority to issue additional shares from time to time without delay or further action by the stockholders except as may be required by applicable law or the NASDAQ listing standards, assuming the Company remains listed on NASDAQ. Our Board is not aware of any attempt to take control of our business and has not considered the reverse stock split to be a tool to be utilized as a type of anti-takeover device. We currently have no plans, proposals or arrangements to issue any shares of common stock that would become newly available for issuance as a result of the reverse stock split.

In addition, if we do issue additional shares of our common stock, the issuance could have a dilutive effect on earnings per share and the book or market value of the outstanding common stock, depending on the circumstances, and would likely dilute a stockholder's percentage voting power in the Company. Holders of common stock are not entitled to preemptive rights or other protections against dilution. Our Board intends to take these factors into account before authorizing any new issuance of shares.

Certain Risks Associated with the Reverse Stock Split

Before voting on this proposal, you should consider the following risks associated with the implementation of the reverse stock split:

- Although we expect that the reverse stock split will result in an increase in the market price of our common stock, we cannot assure you that the reverse stock split, if implemented, will increase the market price of our common stock in proportion to the reduction in the number of shares of common stock outstanding or result in a permanent increase in the market price. The effect the reverse stock split may have upon the market price of our common stock cannot be predicted with any certainty, and the history of similar reverse stock splits for companies in similar circumstances to ours is varied. The market price of our common stock is dependent on many factors, including our business and financial performance, general market conditions, prospects for future success and other factors detailed from time to time in the reports we file with the SEC. Accordingly, the total market capitalization of our common stock after the proposed reverse stock split may be lower than the total market capitalization before the proposed reverse stock split and, in the future, the market price of our common stock following the reverse stock split may not exceed or remain higher than the market price prior to the proposed reverse stock split.
- The reverse stock split may result in some stockholders owning "odd lots" of less than 100 shares of our common stock on a post-split basis. These odd lots may be more difficult to sell, or require greater transaction costs per share to sell, than shares in "round lots" of even multiples of 100 shares.
- While our Board believes that a higher stock price may help generate investor interest, there can be no assurance that the reverse stock split will result in a per share price that will attract institutional investors or investment funds or that such share price will satisfy the investing guidelines of institutional investors or investment funds. As a result, the trading liquidity of our common stock may not necessarily improve.

Procedure for Effecting Reverse Stock Split and Exchange of Stock Certificates

If the reverse stock split is approved by our stockholders, the reverse stock split would become effective at such time prior to the one-year anniversary of this Annual Meeting as it is deemed by our Board to be in the best interests of the Company and its stockholders and we file the amendment to our Amended and Restated Certificate of Incorporation with the Secretary of State of the State of Delaware. Even if the reverse stock split is approved by our stockholders, our Board has discretion not to carry out or to delay in carrying out the reverse stock split. Upon the filing of the amendment, all the old common stock will be converted into new common stock as set forth in the amendment.

As soon as practicable after the effective time of the reverse stock split, stockholders will be notified that the reverse stock split has been effected. If you hold shares of common stock in a book-entry form, you will receive a transmittal letter from our transfer

agent as soon as practicable after the effective time of the reverse stock split with instructions on how to exchange your shares. After you submit your completed transmittal letter, a transaction statement will be sent to your address of record as soon as practicable after the effective date of the reverse stock split indicating the number of post-reverse stock split shares of common stock you hold.

Some stockholders hold their shares of common stock in certificate form or a combination of certificate and book-entry form. Our transfer agent will act as exchange agent for purposes of implementing the exchange of stock certificates, if applicable. If you are a stockholder holding pre-split shares in certificate form, you will receive a transmittal letter from our transfer agent as soon as practicable after the effective time of the reverse stock split. The transmittal letter will be accompanied by instructions specifying how you can exchange your certificate representing the pre-split shares of our common stock for a statement of holding. When you submit your certificate representing the pre-split shares of our common stock, your post-split shares of our common stock will be held electronically in book-entry form in the Direct Registration System. This means that, instead of receiving a new stock certificate, you will receive a statement of holding that indicates the number of post-split shares you own in book-entry form. We will no longer issue physical stock certificates unless you make a specific request for a share certificate representing your post-split ownership interest.

Stockholders should not destroy any stock certificate(s) and should not submit any certificate(s) until requested to do so.

Beginning on the effective time of the reverse stock split, each certificate representing pre-split shares will be deemed for all corporate purposes to evidence ownership of post-split shares.

Fractional Shares

No fractional shares will be issued in connection with the reverse stock split. Instead, we will issue one full share of the post-reverse stock split common stock to any stockholder who would have been entitled to receive a fractional share as a result of the process. Each common stockholder will hold the same percentage of the outstanding common stock immediately following the reverse stock split as that stockholder did immediately prior to the reverse stock split, except for minor adjustment due to the additional net share fraction that will need to be issued as a result of the treatment of fractional shares.

No Dissenter's Rights

Under the Delaware General Corporation Law, our stockholders are not entitled to dissenter's rights with respect to the reverse stock split or the corresponding amendment to our Amended and Restated Certificate of Incorporation to effect the reverse stock split and we will not independently provide our stockholders with any such right.

Federal Income Tax Consequences of the Reverse Stock Split

The following is a summary of important tax considerations of the reverse stock split. It addresses only stockholders who hold our common stock as capital assets. It does not purport to be complete and does not address stockholders subject to special rules, such as financial institutions, tax-exempt organizations, insurance companies, dealers in securities, foreign stockholders, stockholders who hold their pre-reverse stock split shares as part of a straddle, hedge or conversion transaction, and stockholders who acquired their pre-reverse stock split shares pursuant to the exercise of employee stock options or otherwise as compensation. This summary is based upon current law, which may change, possibly even retroactively. It does not address tax considerations under state, local, foreign and other laws. The tax treatment of a stockholder may vary depending upon the particular facts and circumstances of such stockholder. Each stockholder is urged to consult with such stockholder's own tax advisor with respect to the tax consequences of the reverse stock split.

Generally, a reverse stock split will not result in the recognition of gain or loss for federal income tax purposes. The adjusted basis of the new shares of common stock will be the same as the adjusted basis of the common stock exchanged for such new shares. The holding period of the new, post-reverse stock split shares of the common stock resulting from implementation of the reverse stock split will include the stockholder's respective holding periods for the pre-reverse stock split shares. Stockholders who acquired their shares of our common stock on different dates or at different prices should consult their tax advisors regarding the allocation of the tax basis of such shares. Additional information about the effects of the reverse stock split on the basis of holders of our common stock will be included in Internal Revenue Service Form 8937, Report of Organizational Actions Affecting Basis of Securities, which we will post to our website on or before the 45th day following the effective date of the reverse stock split, if effected.

The foregoing views are not binding on the Internal Revenue Service or the courts. Accordingly, each stockholder should consult with his or her own tax advisor with respect to all of the potential tax consequences to him or her of the reverse stock split.

Vote Required and Recommendation of the Board of Directors

The approval of Proposal 3 requires the affirmative vote of a majority of our outstanding shares of common stock. Broker non-votes and abstentions will be counted as votes against the proposal. **The Board recommends that stockholders vote FOR the approval of the amendment to our Amended and Restated Certificate of Incorporation to effect a reverse stock split of our outstanding shares of common stock at one of the following reverse stock split ratios, 1-for-2, 1-for-3, 1-for-4, 1-for-5, 1-for-6 or 1-for-7, as determined by the Board of Directors in its sole discretion, prior to the one-year anniversary of this Annual Meeting.**

PROPOSAL 4: APPROVAL OF AMENDMENT TO AMENDED AND RESTATED CERTIFICATE OF INCORPORATION TO INCREASE THE TOTAL NUMBER OF AUTHORIZED SHARES OF COMMON STOCK FROM 75,000,000 SHARES TO 100,000,000 SHARES

Our Board has adopted and has recommended that our stockholders adopt and approve, an amendment to our amended and restated certificate of incorporation, providing for an increase in the number of our common voting shares, having a par value of \$0.001 per share, from 75,000,000 to 100,000,000. A form of Certificate of Amendment reflecting this proposed amendment is included in Annex B to this proxy statement (the "Certificate of Amendment"). If adopted and approved by the stockholders, the proposed amendment to our amended and restated certificate of incorporation will become effective upon the filing of the Certificate of Amendment with the Secretary of State of the State of Delaware. If the amendment to increase our authorized shares of common stock is approved by stockholders at the 2019 Annual Meeting, we intend to file the Certificate of Amendment as soon as practicable following the 2019 Annual Meeting.

Purposes of the Proposed Amendment

We do not have any present plan, arrangement or understanding to designate and issue any of the shares of common stock that will become available as a result of this proposed amendment to our amended and restated certificate of incorporation. Although, at present, our Board has no immediate plans to issue the additional shares of common stock, it desires to have the shares available to provide additional flexibility to use our common stock for business and financial purposes in the future. The additional 25,000,000 authorized shares of common stock would be available for issuance for various purposes, as our Board may deem advisable, such as for future financings, to satisfy the issuance of shares of common stock on the conversion or exercise of our options, warrants or other convertible securities, to provide equity incentive to employees, consultants, officers and directors, to make stock-based acquisitions and for other general corporate purposes. Furthermore, we may utilize our securities to make future acquisitions. Acquisitions can be a key component of growth and, from time to time, consideration for acquisitions may include the issuance of common stock.

In addition to fund-raising opportunities, we also engage in periodic discussions with potential partners, strategic investments and acquisition candidates. If any of these discussions came to a definitive understanding, it is possible that we could use some of the newly authorized shares in connection with one or more such transactions. We also plan to continue to issue shares of common stock pursuant to our equity incentive plans. We currently have no agreement, commitment, or arrangement, regarding the issuance of common stock in connection with one or more such strategic transactions subsequent to the increase in the number of authorized shares. In addition, we do not have any agreements, commitments or arrangements regarding the issuance of common stock in connection with a fund-raising opportunity or any other purposes not specifically set forth in this proxy statement, other than the At Market Issuance Sales Agreement with Roth Capital Partners, LLC and National Securities Corporation we entered into in September 2017, and the purchase agreement with Lincoln Park Capital Fund, LLC we entered into in October 2018 (which is discussed in Proposal 5 below).

The newly authorized common stock would be available for issuance without further action by stockholders except as required by law, our amended and restated certificate of incorporation or applicable stock exchange requirements. Any such issuance could have the effect of diluting existing stockholders. Our amended and restated certificate of incorporation do not include any preemptive or other rights of stockholders to subscribe for any shares of common stock which may in the future be issued by us, which means that current stockholders do not have a prior right to purchase any new issue of common stock in order to maintain their proportionate ownership of common stock.

Rights of Additional Authorized Shares

The additional common stock to be authorized by stockholder approval of this Proposal 4 would have rights identical to the currently outstanding shares of our common stock.

Possible Anti-Takeover Effects of the Proposed Amendment

In addition to the corporate purposes mentioned above, an increase in the number of authorized shares of our common stock may make it more difficult to, or discourage an attempt to, obtain control of Moleculin by means of a takeover bid that the Board determines is not in the best interest of Moleculin and its stockholders. However, our Board of Directors is not aware of any attempt to take control of our company, and our Board of Directors has not presented this proposal with the intent that it be utilized as a type of anti-takeover device.

Vote Required and Recommendation of the Board of Directors

The approval of Proposal 4 requires the affirmative vote of a majority of our outstanding shares of common stock. Broker non-votes and abstentions will be counted as votes against the proposal. **The Board recommends that stockholders vote FOR the approval of the amendment to our Amended and Restated Certificate of Incorporation to increase the total number of authorized shares of common stock from 75,000,000 shares to 100,000,000 shares.**

PROPOSAL 5: APPROVAL, FOR PURPOSES OF COMPLYING WITH NASDAQ LISTING RULE 5635(D), OF THE ISSUANCE OF MORE THAN 20% OF THE COMPANY'S ISSUED AND OUTSTANDING COMMON STOCK PURSUANT TO THE COMPANY'S PURCHASE AGREEMENT WITH LINCOLN PARK CAPITAL FUND, LLC

General

On October 4, 2018, we entered into a purchase agreement "LP Purchase Agreement" with Lincoln Park Capital Fund, LLC "Lincoln Park" and a registration rights agreement the "LP Registration Agreement" pursuant to which Lincoln Park has agreed to purchase from us up to an aggregate of \$20.0 million worth of our common stock. We are submitting this Proposal 5 to you in order to obtain the requisite stockholder authorization in accordance with The Nasdaq Listing Rules to sell shares of our common stock to Lincoln Park in excess of 20% of our outstanding shares of common stock (as of the date we entered into the LP Purchase Agreement), if we so choose, as more fully described below.

Agreement with Lincoln Park

Under the terms and subject to the conditions of the LP Purchase Agreement, we have the right, but not the obligation, to sell to Lincoln Park, and Lincoln Park is obligated to purchase up to \$20.0 million worth of shares of common stock. Such sales of common stock by us, if any, will be subject to certain limitations, and may occur from time to time, at our sole discretion, over the 36-month period commencing on October 30, 2018 "Commencement Date" as per the LP Registration Agreement.

Thereafter, under the LP Purchase Agreement, on any business day selected by us, we may direct Lincoln Park to purchase up to 100,000 shares of common stock on such business day each, a "Regular Purchase", provided, however, that (i) the Regular Purchase may be increased to up to 200,000 shares, provided that the closing sale price of our common stock is not below \$2.25 on the purchase date (subject to adjustment for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction as provided in the LP Purchase Agreement) and (ii) the Regular Purchase may be increased to up to 250,000 shares, provided that the closing sale price of the common stock is not below \$2.75 on the purchase date (subject to adjustment for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction as provided in the LP Purchase Agreement). In each case, Lincoln Park's maximum commitment in any single Regular Purchase may not exceed \$1,000,000. In addition, upon the first business day after the Commencement Date, we could have directed a one-time tranche purchase of \$1,000,000 worth of shares to Lincoln Park. We did not act upon this option. The purchase price per share for each such Regular Purchase will be based off of prevailing market prices of our common stock immediately preceding the time of sale without any fixed discount. In addition to Regular Purchases, we may also direct Lincoln Park to purchase other amounts as accelerated purchases or as additional accelerated purchases if the closing sale price of the common stock exceeds certain threshold prices as set forth in the LP Purchase Agreement.

In all instances, we may not sell shares of our common stock to Lincoln Park under the LP Purchase Agreement if it would result in Lincoln Park beneficially owning more than 9.99% of our common stock. There are no upper limits on the price per share that Lincoln Park must pay for shares of common stock.

From the Commencement Date through April 1, 2019, we offered and sold 1,988,335 shares of our common stock pursuant to the LP Purchase Agreement (and issued 259,298 commitment shares). These sales resulted in gross proceeds to us of approximately \$2.7 million. As of April 1, 2019, shares of our common stock having an aggregate value of approximately \$17.3 million remained available for sale under this offering program. We currently intend to use the net proceeds from the sale of securities to Lincoln Park to advance our clinical programs and for general corporate purposes.

Requirement to Seek Stockholder Approval

As a result of our listing on The Nasdaq Capital Market, issuances of our common stock are subject to the Nasdaq Marketplace Rules, including Rule 5635(d), which requires us to obtain stockholder approval prior to the issuance of securities in connection with a transaction, other than a public offering, involving the sale, issuance or potential issuance by us of shares of our common stock (or securities convertible into or exercisable for shares of our common stock) at a price less than the lower of: (i) the closing price (as reflected on Nasdaq.com) immediately preceding the signing of the binding agreement; or (ii) the average closing price of the common stock (as reflected on Nasdaq.com) for the five trading days immediately preceding the signing of the binding agreement (the "Nasdaq 20% Rule").

Under the Nasdaq 20% Rule, in no event may we issue or sell to Lincoln Park under the LP Purchase Agreement more than 19.99% of the shares of our common stock outstanding immediately prior to the execution of the LP Purchase Agreement (which was 5,369,613 shares based on 26,861,497 shares outstanding immediately prior to the execution of the LP Purchase Agreement) (the "Exchange Cap"), unless (i) we obtain stockholder approval to issue shares of common stock in excess of the Exchange Cap or (ii) the average price of all applicable sales of common stock to Lincoln Park under the LP Purchase Agreement equals or exceeds \$1.6235, such that issuances and sales of the common stock to Lincoln Park under the LP Purchase Agreement would be exempt from the Exchange Cap limitation under applicable NASDAQ rules. In any event, the LP Purchase Agreement specifically provides that we may not issue or sell any shares of our common stock under the LP Purchase Agreement if such issuance or sale would breach any applicable NASDAQ rules.

As of April 1, 2019, we had issued 2,247,533 shares of our common stock to Lincoln Park under the LP Purchase Agreement, leaving 3,122,080 shares of our common stock available for issuance without seeking stockholder approval. However, as of April 1, 2019, shares of our common stock having an aggregate value of approximately \$17.3 million remained available for sale under this offering program. Based on the closing sale price of our common stock as reported on The Nasdaq Capital Market on such date, to fully utilize the remaining amount available to us, we would need to issue 19,460,225 shares of common stock to Lincoln Park, which would be in excess of the Nasdaq 20% Rule. Accordingly, in order to be able to sell to Lincoln Park the full amount remaining under the LP Purchase Agreement, we are seeking stockholder approval to issue greater than 20% of our outstanding shares as of the date we entered into the agreement with Lincoln Park.

In order to comply with the Nasdaq 20% Rule and to satisfy conditions under the LP Purchase Agreement, we are seeking stockholder approval to permit issuance of more than 20% of our common stock to Lincoln Park pursuant to the LP Purchase Agreement.

Effect of Failure to Obtain Stockholder Approval

As of April 1, 2019, we had issued a total of 2,247,533 shares of common stock to Lincoln Park pursuant to the LP Purchase Agreement. If the stockholders do not approve Proposal 5, we will be unable to issue shares of common stock to Lincoln Park pursuant to the LP Purchase Agreement in excess of the Exchange Cap.

Effect of Approval

Upon obtaining the stockholder approval requested in this Proposal 5, we would no longer be bound by the Nasdaq 20% Rule restriction on issuances of common stock to Lincoln Park. If this Proposal 5 is approved by our stockholders, we would be able to issue more than the original Exchange Cap (or 5,369,613 shares) to Lincoln Park under the LP Purchase Agreement. The maximum number of shares of common stock that we may issue would fluctuate from time to time based on the price of our common stock. Assuming we received the stockholder approval we are requesting in this Proposal 5, and assuming the total number of shares issuable under the purchase agreement were issued on April 1, 2019, a total of 19,460,225 additional shares would be issuable to Lincoln Park, which have an approximate value of \$17.3 million.

In addition, the additional shares that we could issue to Lincoln Park will result in greater dilution to existing stockholders and may result in a decline in our stock price or greater price volatility.

Each additional share of common stock that would be issuable to Lincoln Park would have the same rights and privileges as each share of our currently authorized common stock.

Vote Required and Recommendation of the Board of Directors

The approval of Proposal 5 requires the affirmative vote of a majority of the shares present in person or by proxy and entitled to vote on the matter; provided, however, that the vote of all shares of our common stock issued to Lincoln Park pursuant to the LP Purchase Agreement will not be counted in determining whether or not Proposal 5 is approved. Broker non-votes will not be taken

into account in determining the outcome of the proposal, and abstentions will be counted as votes against the proposal. **The Board recommends that stockholders vote FOR the approval, for purposes of complying with Nasdaq Listing Rule 5635(d), of the issuance of more than 20% of the Company's issued and outstanding common stock pursuant to the Company's purchase agreement with Lincoln Park Capital Fund, LLC.**

PROPOSAL 6: AUTHORIZATION TO ADJOURN THE ANNUAL MEETING

If the Annual Meeting is convened and a quorum is present, but there are not sufficient votes to approve Proposal 3 or 4, one or more of our proxy holders may move to adjourn the Annual Meeting at that time in order to enable our Board to solicit additional proxies.

In this proposal, we are asking our stockholders to authorize one or more of our proxy holders to adjourn the Annual Meeting to another time and place, if necessary, to solicit additional proxies in the event that there are not sufficient votes to approve Proposal 3 or 4. If our stockholders approve this proposal, one or more of our proxy holders can adjourn the Annual Meeting and any adjourned session of the Annual Meeting to allow for additional time to solicit additional proxies, including the solicitation of proxies from our stockholders that have previously voted. Among other things, approval of this proposal could mean that, even if we had received proxies representing a sufficient number of votes to defeat Proposal 3 or 4, we could adjourn the Annual Meeting without a vote on such proposals and seek to convince our stockholders to change their votes in favor of such proposals.

If it is necessary to adjourn the Annual Meeting, no notice of the adjourned meeting is required to be given to our stockholders, other than an announcement at the Annual Meeting of the time and place to which the Annual Meeting is adjourned, so long as the meeting is adjourned for 30 days or less and no new record date is fixed for the adjourned meeting. At the adjourned meeting, we may transact any business which might have been transacted at the original meeting.

Vote Required and Recommendation of the Board of Directors

The approval of Proposal 6 requires the affirmative vote of a majority of the shares present in person or by proxy and entitled to vote on the matter. Broker non-votes will not be taken into account in determining the outcome of the proposal, and abstentions will be counted as votes against the proposal. **The Board recommends that stockholders vote FOR the approval to authorize the adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposals 3 or 4.**

AVAILABILITY OF ANNUAL REPORT ON FORM 10-K

A copy of our 2018 Annual Report on Form 10-K has been mailed concurrently with this proxy statement to stockholders entitled to notice of and to vote at the Annual Meeting, provided that we have not included the exhibits to the Form 10-K. We will provide copies of these exhibits without cost upon request by eligible stockholders. Requests for copies of such exhibits should be mailed to Moleculin Biotech, Inc., 5300 Memorial Drive, Suite 950, Houston, TX 77007, Attention: Corporate Secretary.

OTHER PROPOSED ACTION

Our Board of Directors does not intend to bring any other matters before the Annual Meeting, nor does it know of any matters which other persons intend to bring before the Annual Meeting. If, however, other matters not mentioned in this proxy statement properly come before the Annual Meeting, the persons named in the accompanying form of proxy will vote thereon in accordance with the recommendation of the Board of Directors.

HOUSEHOLDING OF PROXY MATERIALS

The SEC has adopted rules that permit companies and intermediaries (e.g., brokers) to satisfy the delivery requirements for proxy materials with respect to two or more stockholders sharing the same address by delivering a single proxy statement addressed to those stockholders. This process, which is commonly referred to as "householding," potentially means extra convenience for stockholders and cost savings for companies.

This year, a number of brokers with account holders who are the Company's stockholders may be "householding" our proxy materials. A single copy of the proxy materials may be delivered to multiple stockholders sharing an address unless contrary instructions have been received from the affected stockholders. Once you have received notice from your broker that they will be householding communications to your address, householding will continue until you are notified otherwise or until you revoke your consent. If, at any time, you no longer wish to participate in householding and would prefer to receive a separate copy of the

proxy materials, please (1) notify your broker, or (2) direct your written request to Moleculin Biotech, Inc., 5300 Memorial Drive, Suite 950, Houston, TX 77007, Attention: Corporate Secretary. Stockholders who currently receive multiple copies of the proxy materials at their address and would like to request householding of their communications should contact their brokers. In addition, upon written request to the address set forth above, we will promptly deliver a separate copy of the proxy materials to any stockholder at a shared address to which a single copy of the documents was delivered.

STOCKHOLDER PROPOSALS AND SUBMISSIONS

In order to be eligible for inclusion in our proxy statement and form of proxy for our 2020 Annual Meeting, a proposal of a stockholder, including the submission of a stockholder nominee for election to our Board of Directors, must be received at our principal executive offices located in Houston, Texas no later than December 28, 2019 (the “Deadline”). For any proposal that a stockholder wishes to propose for consideration at the 2019 Annual Meeting but does not wish to include in the proxy materials for that meeting, our Amended and Restated Bylaws require a notice of the proposal to be delivered not less than 120 days prior to the anniversary of the mailing date of our proxy materials for the preceding annual meeting of stockholders. The notice of the proposal also must comply with the content requirements for such notices set forth in our Amended and Restated Bylaws

Whether or not you expect to be present at the Annual Meeting, please sign and return the enclosed proxy promptly. Your vote is important. If you are a stockholder of record and attend the Annual Meeting and wish to vote in person, you may withdraw your proxy at any time prior to the vote.

By Order of the Board of Directors
MOLECULIN BIOTECH, INC.

/s/ WALTER V. KLEMP

Walter V. Klempe

Chairman of the Board, President and Chief Executive Officer

Houston, Texas
April 22, 2019

STATE OF DELAWARE
CERTIFICATE OF AMENDMENT
OF THE AMENDED AND RESTATED CERTIFICATE OF INCORPORATION OF
MOLECULIN BIOTECH, INC.

Moleculin Biotech, Inc., a corporation organized and existing under the laws of the State of Delaware (the “Corporation”) for the purpose of amending its Amended and Restated Certificate of Incorporation in accordance with the General Corporation Law of the State of Delaware, does hereby make and execute this Certificate of Amendment to the Amended and Restated Certificate of Incorporation, as amended, and does hereby certify that:

1. The Board of Directors of the Corporation (the “Board”), acting in accordance with the provisions of Sections 141 and 242 of the General Corporation Law of the State of Delaware, adopted resolutions amending its Amended and Restated Certificate of Incorporation (the “Certificate of Incorporation”), so that effective upon the effective time of this Certificate of Amendment to the Certificate of Incorporation with the Secretary of State of the State of Delaware, every [2], [3], [4], [5], [6], [7] shares of the Corporation’s common stock, par value \$0.001 per share (hereinafter the “Common Stock”), issued and outstanding shall, automatically and without any action on the part of the respective holders thereof, be combined and converted into one share of Common Stock without increasing or decreasing the par value of each share of Common Stock (the “Reverse Stock split”) and without increasing or decreasing the authorized number of shares of Common Stock or the Corporation’s preferred stock, par value \$0.001 per share (hereinafter the “Preferred Stock”); provided, however, no fractional shares of Common Stock shall be issued in connection with the Reverse Stock Split, and instead, the Corporation shall issue one full share of post-Reverse Stock Split Common Stock to any stockholder who would have been entitled to receive a fractional share of Common Stock as a result of the Reverse Stock Split. The Reverse Stock Split shall occur whether or not the certificates representing such shares of Common Stock are surrendered to the Corporation or its transfer agent.

2. Thereafter, pursuant to a resolution of the Board, a meeting of the stockholders of the Corporation was duly called and held upon notice in accordance with Section 222 of the General Corporation Law of the State of Delaware at which meeting the necessary number of shares as required by statute were voted in favor of the foregoing amendment.

3. The foregoing amendment has been duly adopted in accordance with the provisions of Section 242 of the General Corporation law of the State of Delaware by the vote of a majority of each class of outstanding stock of the Corporation entitled to vote thereon.

4. This amendment shall be effective as of 5:00 p.m., Eastern Time, on the date of filing of this Certificate of Amendment with the Secretary of State of the State of Delaware.

IN WITNESS WHEREOF, I have signed this Certificate this _____ day of _____, 201__.

Walter V. Klemp
Chief Executive Officer

Annex B

STATE OF DELAWARE
CERTIFICATE OF AMENDMENT
OF THE AMENDED AND RESTATED CERTIFICATE OF INCORPORATION OF
MOLECULIN BIOTECH, INC.

Moleculin Biotech, Inc., a corporation organized and existing under the laws of the State of Delaware (the "Corporation") for the purpose of amending its Amended and Restated Certificate of Incorporation in accordance with the General Corporation Law of the State of Delaware, does hereby make and execute this Certificate of Amendment to the Amended and Restated Certificate of Incorporation, as amended, and does hereby certify that:

1. The provisions of the present Article 4.1 of the Amended and Restated Certificate of Incorporation of the Corporation are amended by amending and restating the second sentence of Article 4.1, with no changes to be made to the previous or subsequent sentences and provisions of Article 4.1:

The total number of shares of all classes of stock that the Corporation shall have the authority to issue is One Hundred Five Million (105,000,000), of which One Hundred Million (100,000,000) shares shall be Common Stock, having a par value of \$0.001 per share, and, Five Million (5,000,000) of such shares shall be Preferred Stock, having a par value of \$0.001 per share.

2. The foregoing amendment has been duly adopted in accordance with the provisions of Section 242 of the General Corporation law of the State of Delaware by the vote of a majority of each class of outstanding stock of the Corporation entitled to vote thereon.

3. This amendment shall be effective as of 5:00 p.m., Eastern Time, on the date of filing of this Certificate of Amendment with the Secretary of State of the State of Delaware.

IN WITNESS WHEREOF, I have signed this Certificate this _____ day of _____, 201__.

Walter V. Klemp
Chief Executive Officer

MOLECULIN BIOTECH, INC.
THIS PROXY IS SOLICITED BY THE BOARD OF DIRECTORS
FOR THE ANNUAL MEETING OF STOCKHOLDERS TO BE HELD ON
MAY 22, 2019

The undersigned stockholder acknowledges receipt of the Notice of Annual Meeting of Stockholders and the Proxy Statement, each dated April 22, 2019, and hereby appoints Walter V. Klemp and Jonathan P. Foster, or either of them, proxies for the undersigned, each with full power of substitution, to vote all of the undersigned's shares of common stock of Moleculin Biotech, Inc. (the "Company") at the Annual Meeting of Stockholders of the Company to be held at 5300 Memorial Drive, Suite 950, Houston, Texas 77007, on May 22, 2019 at 1:30 pm, local time, and at any adjournments or postponements thereof.

1. For All
 Withhold All
 For All Except
- The Board of Directors has nominated the following four persons for election as directors of the Company: Walter V. Klemp, Robert George, Michael Cannon and John Climaco. Their term will expire at the 2020 Annual Meeting of Stockholders, or until their successors are duly elected and qualified.
2. For Against Abstain
- To ratify the appointment of Grant Thornton, LLP as the Company's independent registered public accounting firm for the year ending December 31, 2019.
3. For Against Abstain
- To approve the amendment to the Company's Amended and Restated Certificate of Incorporation to effect a reverse stock split at one of the following reverse stock split ratios, 1-for-2, 1-for-3, 1-for-4, 1-for-5, 1-for-6 or 1-for-7, as determined by the Board of Directors in its sole discretion, prior to the one-year anniversary of this Annual Meeting.
4. For Against Abstain
- To approve an amendment to the Company's certificate of incorporation to increase the total number of authorized shares of common stock from 75,000,000 shares to 100,000,000 shares.
5. For Against Abstain
- To approve, for purposes of complying with Nasdaq Listing Rule 5635(d), the issuance of more than 20% of the Company's issued and outstanding common stock pursuant to the Company's purchase agreement with Lincoln Park Capital Fund, LLC.
6. For Against Abstain
- To authorize an adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposals 3 or 4.
- 7.
- In their discretion, upon such other matters as may properly come before the meeting.

The board of directors recommends a vote FOR the nominees and proposals above and if no specification is made, the shares will be voted for such nominees and proposals.

Dated _____ 2019

Stockholder's Signature

Stockholder's Signature

Signature should agree with name printed hereon. If stock is held in the name of more than one person, EACH joint owner should sign. Executors, administrators, trustees, guardians, and attorneys should indicate the capacity in which they sign. Attorneys should submit powers of attorney.

PLEASE SIGN, DATE AND RETURN THE PROXY IN THE ENVELOPE ENCLOSED. THIS PROXY WILL BE VOTED IN THE MANNER DIRECTED HEREIN BY THE UNDERSIGNED STOCKHOLDER. IF NO DIRECTION IS MADE, THIS PROXY WILL BE VOTED FOR THE NOMINEES SET FORTH IN PROPOSAL 1, FOR THE PROPOSALS SET FORTH IN ITEM 2, 3, 4, 5 AND 6 AND WILL GRANT DISCRETIONARY AUTHORITY PURSUANT TO ITEM 7. THIS PROXY WILL REVOKE ALL PRIOR PROXIES SIGNED BY YOU.