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

**Post-Effective Amendment No. 1
to Form S-1
On
FORM S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

GEMPHIRE THERAPEUTICS INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

47-2389984
(I.R.S. Employer
Identification Number)

**17199 N. Laurel Park Drive, Suite 401
Livonia, Michigan 48152
(734) 245-1700**
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**Dr. Steven Gullans
Interim President and Chief Executive Officer
17199 N. Laurel Park Drive, Suite 401
Livonia, Michigan 48152
(734) 245-1700**
(Name, address, including zip code, and telephone number, including area code, of agent for service)

**Copies to:
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Approximate date of commencement of proposed sale to the public: From time to time after the effective date of this Registration Statement.

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

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, as amended, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box:

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

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

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

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

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

Large accelerated filer Accelerated filer
Non-accelerated filer (Do not check if a smaller reporting company) Smaller reporting company
Emerging growth company

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

[Table of Contents](#)

EXPLANATORY NOTE

On March 10, 2017, Gemphire Therapeutics Inc. (“we” or the “Company”) entered into a securities purchase agreement whereby, on March 15, 2017, we issued and sold shares of our common stock and warrants to purchase shares of our common stock in a private placement. To fulfill our contractual obligations under the registration rights agreement entered into concurrently with the securities purchase agreement, we previously filed a registration statement on Form S-1 (File No. 333-217296), which was declared effective by the Securities and Exchange Commission (“SEC”) on April 20, 2017 (as amended and supplemented, the “prior registration statement”), to register for resale the 2,317,460 shares (the “PIPE Shares”) issued, or issuable upon exercise of the warrants that were issued, upon the closing of the above referenced private placement. In order to continue to fulfill our contractual obligations under the registration rights agreement, we are filing with the SEC this Post-Effective Amendment No. 1 to Form S-1 (this “registration statement”) to convert the prior registration statement on Form S-1 into Form S-3 for the registration of any unsold PIPE Shares and to make certain other updating revisions to the information contained herein so that such information is current as of the date of filing. Accordingly, this registration statement contains an updated prospectus relating to an aggregate of 1,692,641 PIPE Shares that remain unsold as of the date hereof. All applicable fees were paid at the time of filing of the prior registration statement. Upon effectiveness, this registration statement is intended to supersede the prior registration statement.

[Table of Contents](#)

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

SUBJECT TO COMPLETION, DATED SEPTEMBER 1, 2017

PROSPECTUS

1,692,641 Shares



Common Stock

This prospectus relates to the resale, from time to time, of up to 1,692,641 shares of common stock of Gemphire Therapeutics Inc. (the "Company") by the Selling Stockholders listed on page 10, which includes (i) 714,437 shares of our common stock, par value \$0.001 per share (the "Common Stock") issued on March 15, 2017 and (ii) an aggregate of 978,204 shares of our Common Stock (the "Warrant Shares") issuable upon exercise of common stock purchase warrants issued on March 15, 2017 (the "Warrants") by the selling stockholders listed on page 10, including their transferees, pledgees or donees or their respective successors (the "Selling Stockholders"). We are registering these shares on behalf of the Selling Stockholders, to be offered and sold by them from time to time.

We are not selling any securities under this prospectus and we will not receive proceeds from the sale of Common Stock by the Selling Stockholders. However, we may receive proceeds from the cash exercise of the Warrants, which, if exercised in cash at the current applicable exercise price with respect to all of the 978,204 shares of Common Stock, would result in gross proceeds to the Company of \$10.2 million.

We will pay the expenses of registering the shares of Common Stock offered by this prospectus, but all selling and other expenses incurred by each Selling Stockholder will be paid by such Selling Stockholder. The Selling Stockholders may sell the shares of our Common Stock offered by this prospectus from time to time on terms to be determined at the time of sale through ordinary brokerage transactions or through any other means described in this prospectus under "Plan of Distribution." The prices at which the Selling Stockholders may sell shares will be determined by the prevailing market price for shares of our Common Stock or in negotiated transactions.

Our Common Stock trades on the NASDAQ Global Market under the symbol "GEMP". On August 31, 2017, the last reported sale price per share of our Common Stock was \$9.64 per share.

We are an emerging growth company as that term is used in the Jumpstart Our Business Startups Act of 2012 and, as such, have elected to comply with certain reduced public company reporting requirements for this prospectus and future filings.

Investing in our Common Stock involves a high degree of risk. See "Risk Factors" beginning on page 6 of this prospectus.

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

Prospectus dated _____, 2017

TABLE OF CONTENTS

| | |
|---|----|
| ABOUT THIS PROSPECTUS | 1 |
| PROSPECTUS SUMMARY | 2 |
| RISK FACTORS | 6 |
| SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS | 6 |
| STATISTICAL DATA AND MARKET INFORMATION | 8 |
| USE OF PROCEEDS | 8 |
| SELLING STOCKHOLDERS | 10 |
| DESCRIPTION OF CAPITAL STOCK | 14 |
| PLAN OF DISTRIBUTION | 21 |
| LEGAL MATTERS | 24 |
| EXPERTS | 24 |
| WHERE YOU CAN FIND ADDITIONAL INFORMATION | 24 |
| INCORPORATION OF CERTAIN INFORMATION BY REFERENCE | 24 |

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or SEC, using a “shelf” registration process. Under this shelf registration statement, the Selling Stockholders may resell from time to time up to 1,692,641 shares of our Common Stock, which includes shares of our Common Stock issuable upon the exercise of Warrants, issued to the Selling Stockholders in a private placement. We are not selling any shares of Common Stock under this prospectus and will not receive any proceeds from the sale of shares of Common Stock by the Selling Stockholders.

You should rely only on the information contained in, or incorporated by reference into, this prospectus and any applicable prospectus supplement, along with the information contained in any free writing prospectuses prepared by or on behalf of us or to which we have referred you. We have not authorized anyone to provide you with different or additional information. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus, the accompanying prospectus supplement or in any related free writing prospectus prepared by or on behalf of us or to which we have referred you.

The information appearing in this prospectus (as supplemented and amended) is accurate only as of the date on the front of the document and that any information we have incorporated by reference is accurate only as of the date of the document incorporated by reference, regardless of the time of delivery of this prospectus, any applicable prospectus supplement or any related free writing prospectus, or any sale of a security. Our business, financial condition, results of operations and prospects may have changed since those dates.

This prospectus contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described below under the section entitled “Where You Can Find Additional Information.”

This prospectus contains references to trademarks belonging to us and other entities. Solely for convenience, trademarks and trade names referred to in this prospectus, including logos, artwork and other visual displays, may appear without the ® or ™ symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the rights of the applicable licensor to these trademarks and trade names. We do not intend our use or display of other companies’ trade names or trademarks to imply a relationship with, or endorsement or sponsorship of us by, any other companies.

PROSPECTUS SUMMARY

This summary highlights selected information contained elsewhere in this prospectus or incorporated by reference in this prospectus, and does not contain all of the information that you need to consider in making your investment decision. You should carefully read the entire prospectus, any applicable prospectus supplement and any related free writing prospectus, including the risks of investing in our common stock discussed under the heading “Risk Factors” contained herein, in any applicable prospectus supplement and any related free writing prospectus, and under similar headings in the other documents that are incorporated by reference into this prospectus. You should also carefully read the information incorporated by reference into this prospectus, including our financial statements, and the exhibits to the registration statement of which this prospectus is a part. Unless the context requires otherwise, references in this prospectus to “Gemphire,” “we,” “us,” “the Company” and “our” refer to Gemphire Therapeutics Inc.

Company Overview

Gemphire is a clinical-stage biopharmaceutical company that is committed to helping patients with cardiometabolic disorders, including dyslipidemia and NASH. We are focused on providing new treatment options for cardiometabolic diseases through our complementary, convenient, cost-effective product candidate, gemcabene, as add-on to the standard of care especially statins that will benefit patients, physicians, and payors. We are developing our product candidate gemcabene (CI-1027), a novel, once-daily, oral therapy, for high risk cardiovascular patients who are unable to achieve normal levels of LDL-C or triglycerides with currently approved therapies, primarily statin therapy and for those patients who present with NASH. Gemcabene’s mechanism of action is designed to enhance the clearance of very low-density lipoproteins (VLDLs) remnants from the plasma and inhibit the production of fatty acids and cholesterol in the liver. Gemcabene is liver-directed and inhibits apolipoprotein C-III (apoC-III) mRNA expression in the liver and inhibits fatty acid and cholesterol synthesis in liver. In cell based studies, gemcabene has been shown to inhibit cytokine induced C-reactive protein production, an inflammatory marker. In preclinical animal models and in human clinical trials, gemcabene has been shown to significantly reduce plasma levels of C-reactive protein. Gemcabene has been tested as monotherapy and in combination with all doses of statins and other drugs in 956 subjects, which we define as healthy volunteers and patients, across 20 Phase 1 and Phase 2 clinical trials and has demonstrated promising evidence of efficacy, safety and tolerability.

Cardiovascular disease is a major health concern, causing more deaths globally than any other disease. Dyslipidemia leads to cardiovascular disease and is generally an important predictor of cardiovascular events including heart attack and stroke. Dyslipidemia is generally characterized by an elevation of low-density lipoprotein cholesterol (LDL-C), or bad cholesterol, triglycerides, or fat in the blood, or both. It represents one of the largest therapeutic areas with annual worldwide drug sales of approximately \$22 billion in 2013. We estimate more than 40% of Americans have elevated LDL-C or triglycerides, or both. Statins, such as atorvastatin or rosuvastatin, are standard of care for LDL-C lowering, while fibrates, prescription fish oils and niacin are standard of care for triglyceride lowering. Although these drugs are highly prescribed and capable of reducing LDL-C and triglyceride levels, many patients are unable to effectively manage their dyslipidemia with currently approved therapies and are in need of additional treatment options. For example, approximately 40% of patients on statins are unable to meet their LDL-C lowering goal, and doubling a statin dose has shown to incrementally lower LDL-C levels by a nominal percentage (approximately 6% based on historical evidence), while increasing safety and tolerability concerns. An even higher percentage of patients with severe hypertriglyceridemia do not achieve triglyceride levels low enough to reduce the risk of developing co-morbidities such as pancreatitis.

[Table of Contents](#)

Non-alcoholic steatohepatitis (NASH) is part of a group of conditions called nonalcoholic fatty liver disease (NAFLD) that affects one out of four people in the United States. In the United States NASH affects up to approximately 2-5% of the population, or between six to eight million people. The presentation of NASH resembles alcoholic liver disease but occurs in people who drink little or no alcohol. The major feature of NASH is excess fat content in the liver, along with inflammation and liver damage. It can lead to liver cirrhosis, fibrosis, hepatocellular carcinoma, liver failure, liver-related death and liver transplantation. NASH can also lead to an increased risk of cardiovascular disease, which is a leading cause of death in this patient population. Prevalence of NASH has increased due to the growing number of obese and diabetic patients. It is more common in women than in men and currently there are no FDA approved therapies for treating NASH.

Recent Developments

At-the-market program

On September 1, 2017, we entered into an Equity Distribution Agreement (the “Equity Distribution Agreement”) with Piper Jaffray & Co., as agent. Under the Equity Distribution Agreement, we may, from time to time, issue and sell shares of our Common Stock having up to an aggregate offering price of \$50,000,000 through an “at the market offering” program.

Corporate Information

We were formed in Michigan as Michigan Life Therapeutics, LLC (MLT) in November 2008. In October 2014, we incorporated a new entity under the name Gemphire Therapeutics Inc. in Delaware. MLT then merged with and into Gemphire, with Gemphire as the surviving entity. The purpose of the merger was to change the jurisdiction of our incorporation from Michigan to Delaware and to convert from a limited liability company to a corporation. Our principal executive offices are located at 17199 N. Laurel Park Dr., Suite 401, Livonia, Michigan 48152, and our telephone number is (734) 245-1700. Our corporate website address is www.gemphire.com. Information contained on or accessible through our website is not a part of this prospectus, and the inclusion of our website address in this prospectus is an inactive textual reference only.

Implications of Being an Emerging Growth Company

As a company with less than \$1.07 billion in revenue during our last fiscal year, we qualify as an “emerging growth company,” as defined in the Jumpstart Our Business Startups Act (JOBS Act) enacted in April 2012. As an “emerging growth company” we are:

- permitted to present only two years of audited financial statements and only two years of related Management’s Discussion and Analysis of Financial Condition and Results of Operations disclosure;
- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended;
- permitted to take advantage of reduced disclosure obligations regarding executive compensation in our periodic reports, proxy statements and registration statements; and
- permitted to take advantage of exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We may use these provisions until the last day of our fiscal year following the fifth anniversary of the closing of our initial public offering. However, if certain events occur prior to the end of such five-year period, including if we become a “large accelerated filer,” our annual gross revenue exceeds \$1.07 billion or we issue more than \$1.0 billion of non-convertible debt in any three-year period, we will cease to be an emerging growth company prior to the end of such five-year period. We have elected to take advantage of certain of the reduced disclosure obligations in the registration statement of which this prospectus is a part and documents incorporated by reference into this prospectus and may elect to take advantage of other reduced reporting requirements in future filings. As a result, the information that we provide to our

[Table of Contents](#)

stockholders may be different than you might receive from other public reporting companies in which you hold equity interests.

The JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. We have irrevocably elected not to avail ourselves of this exemption and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

The Offering

| | |
|--|--|
| Common Stock offered by Selling Stockholders | 1,692,641 shares |
| Common Stock to be outstanding after this offering | 10,633,042 (as of August 24, 2017) |
| Use of proceeds | We will not receive any proceeds from the sale by the Selling Stockholders of the shares of Common Stock being offered by this prospectus. |
| Risk factors | You should read the “Risk Factors” section included or incorporated by reference in this prospectus for a discussion of certain of the factors to consider carefully before deciding to purchase any shares of our Common Stock. |
| NASDAQ Global Market symbol | “GEMP” |

Except as otherwise indicated, all information in this prospectus is based on 10,633,042 shares of Common Stock outstanding as of August 24, 2017 and excludes the following:

- the 978,204 Warrant Shares being offered by the Selling Stockholders pursuant to this prospectus;
- 2,464,140 shares of Common Stock issuable upon the exercise of outstanding stock options, having a weighted average exercise price of \$9.46 per share; and
- 212,329 shares of our Common Stock reserved for future issuance under our equity incentive plans.

On March 10, 2017, we entered into a securities purchase agreement for a private placement with the Selling Stockholders whereby, on March 15, 2017 we issued and sold 1,324,256 units at a price of \$9.47 per unit for gross proceeds of approximately \$12.5 million. Each unit consists of one share of our Common Stock and a Warrant to purchase 0.75 shares of Common Stock. The Warrants have an exercise price of \$10.40 per share and are exercisable for a period of five years from the date of issuance. For a detailed description of the transactions contemplated by the securities purchase agreement with the Selling Stockholders and the securities issued pursuant thereto, see “Relationships with the Selling Stockholders—Private Placement” in this prospectus.

Pursuant to the above-referenced securities purchase agreement and to fulfill our contractual obligations under the registration rights agreement (the “Registration Rights Agreement”) entered into concurrently with the securities purchase agreement, we previously filed a registration statement on Form S-1 (File No. 333-217296), which was declared effective by the SEC on April 20, 2017 (as amended and supplemented,

[Table of Contents](#)

the “prior registration statement”), to register for resale the 2,317,460 shares (the “PIPE Shares”) issued, or issuable upon exercise of the warrants that were issued, upon the closing of the above referenced private placement. In order to continue to fulfill our contractual obligations under the Registration Rights Agreement, we filed the registration statement of which this prospectus forms a part to convert the prior registration statement on Form S-1 into Form S-3 for the registration of an aggregate of 1,692,641 PIPE Shares that remain unsold and to make certain other updating revisions to the information contained herein so that such information is current as of the date of filing of such registration statement. Upon effectiveness, this registration statement is intended to supersede the prior registration statement. Throughout this prospectus, when we refer to the Selling Stockholders, we are referring to the Selling Stockholders identified in this prospectus and, as applicable, their permitted transferees or other successors-in-interest that may be identified in a supplement to this prospectus or, if required, a post-effective amendment to the registration statement of which this prospectus is a part.

RISK FACTORS

Investing in our common stock involves a high degree of risk. Before deciding whether to invest in our common stock, you should consider carefully the risks and uncertainties described under the heading “Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2016, our Quarterly Report on Form 10-Q for the quarter ended June 30, 2017 and other filings we make with the SEC from time to time, which are incorporated by reference herein in their entirety, together with other information in this prospectus (as supplemented and amended). The risks described in these documents are not the only ones we face, but those that we consider to be material. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. Please also read carefully the section below entitled “Special Note Regarding Forward-Looking Statements.”

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference herein contain forward-looking statements. We may, in some cases, use words such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” or the negative of those terms, and similar expressions that convey uncertainty of future events or outcomes to identify these forward-looking statements. Any statements contained herein that are not statements of historical facts may be deemed to be forward-looking statements. Forward-looking statements included or incorporated by reference in this prospectus include, but are not limited to, statements about:

- our anticipated timing of regulatory submissions; commencement and completion of preclinical studies and clinical trials, meetings with the FDA and other regulatory authorities; and product approvals for gemcabene or any other product candidates we may pursue in the future;
- the outcome of our ongoing preclinical toxicology studies related to our partial clinical hold with respect to clinical trials of longer than six months in duration;
- the outcome of our Phase 2 and Phase 3 clinical trials of gemcabene and our ability to replicate positive results from a completed clinical trial in a future clinical trial;
- our expected clinical trial designs and regulatory pathways;
- our expectation that the FDA will not require us to complete a cardiovascular outcomes trial prior to approval;
- our expectations for the attributes of gemcabene or any other product candidate we may pursue in the future, including pharmaceutical properties, efficacy, safety, dosing regimens and cost, as compared to other lipid-lowering therapies;
- our ability to design an efficient development plan;
- our expectation that our existing capital resources will be sufficient to enable us to complete our planned late stage clinical trials and complete certain preclinical studies;

[Table of Contents](#)

- our plans to advance the late-stage clinical development of gemcabene across multiple target indications, pursue oral combination opportunities for gemcabene, maximize the global commercial value of gemcabene and leverage the expertise and experience of our management team to evaluate future in-license acquisition opportunities;
- our estimates regarding industry trends and market potential for gemcabene;
- if approved, our ability to maintain regulatory approval of gemcabene and respond and adhere to regulatory requirements;
- our ability to identify, in-license or acquire, develop and, if approved, successfully commercialize best-in-class products, including gemcabene or any other product candidates we may pursue in the future;
- our ability to enhance brand awareness among key thought leaders and physicians;
- if approved, the rate and degree of market acceptance of gemcabene or any other product candidates we may pursue in the future;
- if approved, our ability to compete with other companies that are, or may be, developing or selling products that may compete with gemcabene;
- reimbursement policies, including any future changes to such policies or related government legislation and our ability to sell gemcabene, if approved;
- regulatory and legal developments in the United States and in foreign countries;
- our ability to obtain and maintain intellectual property protection for gemcabene or any other product candidates we may pursue in the future and not infringe upon the intellectual property of others;
- our ability to fund our working capital requirements;
- our estimates of our expenses, ongoing losses, future revenue, capital requirements and our needs for, or ability to, obtain additional financing;
- our ability to attract strategic partnering relationships, as appropriate, for the development and commercialization of gemcabene;
- the ability of any third parties with whom we collaborate for the development and commercialization of gemcabene to successfully perform their assigned functions;
- our ability to retain and recruit key scientific and management personnel;
- our financial performance; and
- our expectations regarding the period during which we qualify as an emerging growth company under the JOBS Act.

These forward-looking statements reflect our management's beliefs and views with respect to future events and are based on estimates and assumptions as of the date they are made and are subject to risks and

[Table of Contents](#)

uncertainties. We discuss many of these risks in greater detail under the heading “Risk Factors” contained herein, in any applicable prospectus supplement and any related free writing prospectus, and under similar headings in the other documents that are incorporated by reference into this prospectus. Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. Given these uncertainties, you should not place undue reliance on these forward-looking statements.

You should read this prospectus, any applicable prospectus supplement, together with the documents we have filed with the SEC that are incorporated by reference and any free writing prospectus that we may authorize for use in connection with this offering completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements included or incorporated by reference in the foregoing documents by these cautionary statements. Except as required by law, we undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise. Thus, you should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements.

In addition, statements that “we believe” and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date they are made, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and investors are cautioned not to unduly rely upon these statements.

STATISTICAL DATA AND MARKET INFORMATION

This prospectus and the documents incorporated by reference herein contain estimates and other statistical data made by independent parties and by us relating to market size, the incidence of certain medical conditions and other industry data. These data, to the extent they contain estimates or projections, involve a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates or projections. Industry publications and other reports we have obtained from independent parties generally state that the data contained in these publications or other reports have been obtained in good faith or from sources considered to be reliable, but they do not guarantee the accuracy or completeness of such data. The industry in which we operate is subject to risks and uncertainties due to a variety of factors, including those incorporated by reference in the section “Risk Factors.” These and other factors could cause results to differ materially from those expressed in these publications and reports.

USE OF PROCEEDS

We are not selling any securities under this prospectus and will not receive any proceeds from the sale of shares of Common Stock offered by this prospectus by the Selling Stockholders. However, we may receive proceeds from the cash exercise of the Warrants, which, if exercised in cash at the current exercise price with respect to all 978,204 Warrant Shares, would result in gross proceeds to us of approximately \$10.2 million. The use of proceeds from such Warrant exercises, if any, will not be subject to any restrictions. Under certain conditions set forth in the Warrants, the Warrants are exercisable on a cashless basis. If the Warrants are exercised on a cashless basis, we would not receive any cash payment from the Selling Stockholders upon any exercise of the Warrants. For information about the Selling Stockholders, see “Selling Stockholders.”

[Table of Contents](#)

The Selling Stockholders will pay any underwriting discounts and commissions and expenses incurred by the Selling Stockholders for brokerage or legal services or any other expenses incurred by the Selling Stockholders in disposing of the shares of Common Stock offered hereby. We will bear all other costs, fees and expenses incurred in effecting the registration of the shares of Common Stock covered by this prospectus, including all registration and filing fees and fees and expenses of our counsel and accountants.

SELLING STOCKHOLDERS

On March 10, 2017, we entered into a Securities Purchase Agreement (the “Purchase Agreement”) with the Selling Stockholders, pursuant to which we agreed to issue and sell to the Selling Stockholders 1,324,256 units at a price of \$9.47 per unit for total gross proceeds of approximately \$12.5 million before deducting placement agent fees and estimated offering expenses (the “Private Placement”). Under the Purchase Agreement, we agreed to use the net proceeds to fund development costs of gemcabene, including the planned Phase 2 clinical trial of gemcabene in NASH patients, to fund manufacturing related activities for gemcabene and for general corporate purposes. The Private Placement closed on March 15, 2017. Each unit consists of one share of Common Stock (for an aggregate of 1,324,256 shares of Common Stock) and a Warrant to purchase 0.75 shares of Common Stock (for an aggregate of 993,204 Warrant Shares). The Warrants issued in the Private Placement will expire on March 15, 2022, five years after the date on which they were initially issued.

In connection with the Private Placement, we entered into a Registration Rights Agreement with the Selling Stockholders pursuant to which we agreed to file a registration statement with the SEC covering the resale of the shares of Common Stock sold in the Private Placement and underlying the Warrants. We agreed to file such registration statement within 30 days of the closing of the Private Placement. We also agreed to file a registration statement on Form S-3 registering the PIPE Shares promptly after such form became available to us. The Registration Rights Agreement includes customary indemnification rights in connection with the registration statement. In accordance with the Registration Rights Agreement, we previously filed the prior registration statement to register the PIPE Shares for resale.

Pursuant to the Registration Rights Agreement, we filed the registration statement of which this prospectus forms a part to convert the prior registration statement on Form S-1 into Form S-3 for the registration of an aggregate of 1,692,641 PIPE Shares that remain unsold and to make certain other updating revisions to the information contained herein so that such information is current as of the date of filing of such registration statement. Upon effectiveness, this registration statement is intended to supersede the prior registration statement.

The foregoing summary descriptions of the Purchase Agreement, the Warrants and the Registration Rights Agreement do not purport to be complete and are qualified in their entirety by reference to the full text of such documents, which were filed as exhibits to our Current Report on Form 8-K, dated March 13, 2017 and are incorporated by reference herein.

The table below sets forth, to our knowledge, information concerning the beneficial ownership of shares of our Common Stock by the Selling Stockholders as of August 24, 2017. The information in the table below with respect to the Selling Stockholders has been obtained from the Selling Stockholders. The Selling Stockholders may sell all, some or none of the shares of Common Stock subject to this prospectus. See “Plan of Distribution.”

Beneficial ownership is determined in accordance with the rules of the SEC, and includes voting or investment power with respect to shares. Unless otherwise indicated below, to our knowledge, each Selling Stockholder named in the table has sole voting and investment power with respect to the shares of Common Stock beneficially owned by it. The inclusion of any shares in this table does not constitute an admission of beneficial ownership for any Selling Stockholder named below.

[Table of Contents](#)

| Name of Selling Stockholder | Number of Shares of Common Stock Beneficially Owned Prior to Offering(1) | Number of Shares of Common Stock Offered | Number of Shares of Common Stock Offered Upon Exercise of Warrants | Beneficial Ownership After Offering | |
|--|--|--|--|-------------------------------------|-------------------------|
| | | | | Number of Shares | Ownership Percentage(2) |
| Cormorant Global Healthcare Master Fund, LP(3) | 698,151(3) | 43,917 | 32,938 | 621,296 | 5.4% |
| Excel Venture Fund II, L.P.(4) | 898,422(4) | 52,798 | 39,599 | 806,025 | 6.9% |
| Adage Capital Partners L.P.(5) | 875,834 | 200,000 | 150,000 | 525,834 | 4.5% |
| Sigma Emerging Markets Ltd.(6) | 342,397 | 52,798 | 39,599 | 250,000 | 2.2% |
| Nainoor Thakore | 135,093 | 31,679 | 23,760 | 79,654 | * |
| Andy Sassine | 201,666(7) | 21,119 | 15,840 | 164,707 | 1.4% |
| Nathaniel Dalton | 15,840 | 0 | 15,840 | 0 | * |
| Daybreak Investments LLC(8) | 175,220 | 21,119 | 0 | 154,101 | 1.3% |
| AIGH Investment Partners LP(9) | 54,599 | 0 | 39,599 | 15,000 | * |
| Aspire Capital Fund, LLC(10) | 369,590 | 211,194 | 158,396 | 0 | * |
| Brio Capital Master Fund Ltd.(11) | 23,759 | 0 | 23,759 | 0 | * |
| CRMA SPV, L.P.(12) | 141,448 | 8,881 | 6,661 | 125,906 | 1.1% |
| DAFNA Lifescience LP(13) | 23,759 | 0 | 23,759 | 0 | * |
| DAFNA Lifescience Select LP(14) | 15,840 | 0 | 15,840 | 0 | * |
| Highland Long/Short Healthcare Fund | 118,797 | 0 | 118,797 | 0 | * |
| Intracoastal Capital, LLC(15) | 12,000 | 0 | 12,000 | 0 | * |
| Iroquois Capital Investment Group LLC(16) | 15,840 | 0 | 15,840 | 0 | * |
| Iroquois Master Fund LTD.(17) | 7,920 | 0 | 7,920 | 0 | * |
| Kingsbrook Opportunities Master Fund LP (18) | 19,800 | 0 | 19,800 | 0 | * |
| Pedro Lichtinger | 114,643(19) | 10,559 | 7,920 | 96,164 | * |
| Lincoln Park Capital Fund, LLC(20) | 38,500 | 0 | 37,500 | 1,000 | * |
| Monashee Investment Mgmt LLC(21) | 46,199 | 26,399 | 19,800 | 0 | * |
| NexPoint Capital, Inc. | 118,796 | 0 | 118,796 | 0 | * |
| P. Kent Hawryluk Revocable Trust | 100,639(22) | 25,000 | 18,750 | 56,889 | * |
| Timothy Sullivan | 6,467 | 3,695 | 2,772 | 0 | * |
| The Hewlett Fund LP(23) | 8,759 | 0 | 8,759 | 0 | * |
| Patrick S. Wilmerding | 9,239 | 5,279 | 3,960 | 0 | * |

* Represents beneficial ownership of less than one percent.

- (1) Beneficial ownership is determined in accordance with Rule 13d-3 under the Securities Act, and includes any shares as to which the Selling Stockholder has sole or shared voting power or investment power, and also any shares which the Selling Stockholder has the right to acquire within 60 days of August 24, 2017, whether through the exercise or conversion of any stock option, convertible security, warrant or other right. The indication herein that shares are beneficially owned is not an admission on the part of the Selling Stockholder that he, she or it is a direct or indirect beneficial owner of those shares.

The share numbers in this table do not reflect that a Selling Stockholder may not exercise such Warrants to the extent such exercise would cause such Selling Stockholder, together with its affiliates and attribution parties, to beneficially own a number of shares of Common Stock which would exceed 4.999% of our then outstanding Common Stock following such exercise; provided, however, that upon prior notice to us, such Selling Stockholder may increase its ownership, provided that in no event will the ownership exceed 9.999%.

- (2) Based upon 11,611,246 shares of Common Stock issued and outstanding as of August 24, 2017, assuming full exercise of the Warrants and issuance of the 978,204 Warrant Shares.
- (3) Represents (i) 665,213 shares of Common Stock and (ii) 32,938 shares of Common Stock underlying the Warrants, which are exercisable within 60 days of August 24, 2017, held by Cormorant Global Healthcare Master Fund, LP (“Cormorant Fund”). Cormorant Asset Management, LLC, an affiliate of Cormorant

[Table of Contents](#)

Fund, and Bihua Chen, the managing member of the General Partner of Cormorant Global Healthcare Master Fund, LP, who has voting control and investment discretion over the shares of Common Stock, may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Cormorant Fund.

- (4) Excel Venture Fund II, L.P. is an affiliate of Excel Ventures II GP, LLC (“Excel”), of which Dr. Gullans, our Interim President and Chief Executive Officer and a member of our Board of directors, is a Manager. Represents (a) 858,823 shares of Common Stock held by Excel Venture Fund II, L.P. and (b) 39,599 shares underlying the Warrants, which are exercisable within 60 days of August 24, 2017 held by Excel Venture Fund II, L.P. Dr. Gullans, Frederick R. Blume, Juan Enriquez and Caleb M. Winder, who have voting control and investment discretion over the shares of Common Stock, may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Excel Venture Fund II, L.P.
- (5) Adage Capital Partners, GP, LLC is the General Partner of Adage Capital Partners, L.P., and Adage Capital Advisors, LLC, Robert Atchinson, and Phillip Gross are the managing members of Adage Capital Partners, L.P., and have voting control and investment discretion over the shares of Common Stock. As a result, each of Adage Capital Partners, GP, LLC, Adage Capital Advisors, LLC, and Messrs. Atchinson and Gross may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Adage Capital Partners, L.P.
- (6) Jaime Javier Montealegre Lacayo has voting control and investment discretion over the shares of Common Stock. As a result, Mr. Lacayo may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Sigma Emerging Markets Ltd.
- (7) Mr. Sassine is a member of our Board. Represents (a) 136,264 shares of Common Stock held by Mr. Sassine, (b) 49,562 shares underlying options to purchase Common Stock that are exercisable within 60 days of August 24, 2017 and (c) 15,840 shares underlying the Warrants, which are exercisable within 60 days of August 24, 2017.
- (8) Nathaniel Dalton and Amy Dalton are the sole managers of Daybreak Investments LLC, which has voting control and investment discretion over the shares of Common Stock. As a result, each of Mr. Dalton and Mrs. Dalton may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Daybreak Investments LLC.
- (9) Orin Hirschman, the General Partner of AIGH Investment Partners L.P., has voting control and investment discretion over the shares of Common Stock. As a result, Mr. Hirschman may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by AIGH Investment Partners L.P.
- (10) Steven G. Martin, manager of Aspire Capital Fund, LLC, has voting control and investment discretion over the shares of Common Stock. As a result, Mr. Martin may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Aspire Capital Fund, LLC.
- (11) Shaye Hirsch, director of Brio Capital Master Fund Ltd., has voting control and investment discretion over the shares of Common Stock. As a result, Mr. Hirsch may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Brio Capital Master Fund Ltd.
- (12) Bihua Chen, the managing member of the investment manager of CRMA SPV, L.P., has voting control and investment discretion over the shares of Common Stock. As a result, Mr. Chen may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by CRMA SPV, L.P.

[Table of Contents](#)

- (13) Nathan Fischel, CEO, and Fariba Ghodsian, CIO of DAFNA Lifescience L.P., have voting control and investment discretion over the shares of Common Stock. As a result, each of Messrs. Fischel and Ghodsian may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by DAFNA Lifescience L.P.
- (14) Nathan Fischel, CEO, and Fariba Ghodsian, CIO, of DAFNA Lifescience Select L.P., have voting control and investment discretion over the shares of Common Stock. As a result, each of Messrs. Fischel and Ghodsian may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by DAFNA Lifescience Select L.P.
- (15) Mitchell P. Kopin (“Mr. Kopin”) and Daniel B. Asher (“Mr. Asher”), each of whom are managers of Intracoastal Capital LLC (“Intracoastal”), have shared voting control and investment discretion over the securities reported herein that are held by Intracoastal. As a result, each of Mr. Kopin and Mr. Asher may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Intracoastal.
- Mr. Asher, who is a manager of Intracoastal, is also a control person of a broker-dealer. As a result of such common control, Intracoastal may be deemed to be an affiliate of a broker-dealer. Intracoastal acquired the Common Stock being registered hereunder in the ordinary course of business, and at the time of the acquisition of the Common Stock and Warrants described herein, Intracoastal did not have any arrangements or understandings with any person to distribute such securities.
- (16) Richard Abbe, the managing member of Iroquois Capital Investment Group LLC, has the power to vote and dispose of the shares held by Iroquois Capital Investment Group LLC and may be deemed to be the beneficial owner of these shares. Mr. Abbe disclaim beneficial ownership of these securities.
- (17) Richard Abbe, the President and Portfolio Manager of Iroquois Capital Management, LLC, the Investment Manager of Iroquois Master Fund Ltd., has the power to vote and dispose of the shares held by Iroquois Master Fund Ltd. and may be deemed to be the beneficial owner of these shares. Mr. Abbe disclaim beneficial ownership of these securities.
- (18) Kingsbrook Partners LP (“Kingsbrook Partners”) is the investment manager of Kingsbrook Opportunities Master Fund LP (“Kingsbrook Opportunities”) and consequently has voting control and investment discretion over securities held by Kingsbrook Opportunities. Kingsbrook Opportunities GP LLC (“Opportunities GP”) is the general partner of Kingsbrook Opportunities and may be considered the beneficial owner of any securities deemed to be beneficially owned by Kingsbrook Opportunities. KB GP LLC (“GP LLC”) is the general partner of Kingsbrook Partners and may be considered the beneficial owner of any securities deemed to be beneficially owned by Kingsbrook Partners. Ari J. Storch, Adam J. Chill and Scott M. Wallace are the sole managing members of Opportunities GP and GP LLC and as a result may be considered beneficial owners of any securities deemed beneficially owned by Opportunities GP and GP LLC. Each of Kingsbrook Partners, Opportunities GP, GP LLC and Messrs. Storch, Chill and Wallace disclaim beneficial ownership of these securities.
- (19) Mr. Lichtinger is a member of our Board. Represents (a) 59,833 shares of Common Stock held by Mr. Lichtinger, (b) 46,890 shares underlying options to purchase Common Stock that are exercisable within 60 days of August 24, 2017 and (c) 7,920 shares underlying the Warrants, which are exercisable within 60 days of August 24, 2017.
- (20) Joshua Scheinfeld and Jonathan Cope, the principals of Lincoln Park are deemed to be beneficial owners of all the shares of Common Stock owned by Lincoln Park. Messrs. Scheinfeld and Cope have shared voting and dispositive power over the shares.
- (21) Jeff Muller, has voting control and investment discretion over the shares of Common Stock. As a result, Mr. Muller may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by Monashee Investment Mgmt LLC.

[Table of Contents](#)

- (22) P. Kent Hawryluk is a member of our Board. Represents (a) 81,889 shares of Common Stock held by the P. Kent Hawryluk Revocable Trust (the "Trust"), of which Mr. Hawryluk is the trustee and (b) 18,750 shares underlying the Warrants, which are exercisable within 60 days of August 24, 2017 held by the P. Kent Hawryluk Revocable Trust, of which Mr. Hawryluk is the trustee.
- (23) Martin Chopp, the general partner of The Hewlett Fund LP, has voting control and investment discretion over the shares of Common Stock. As a result, Mr. Chopp may be deemed to have beneficial ownership (as determined under Section 13(d) of the Exchange Act) of the securities reported herein that are held by The Hewlett Fund LP.

Relationships with the Selling Stockholders

Directors and Affiliated Funds

Pedro Lightinger and Andrew Sassine, who are members of our board of directors, are Selling Stockholders. The Trust, of which Mr. Hawryluk, a member of our board of directors, is the trustee, is a Selling Stockholder. Excel Venture Fund II, L.P. is an affiliate of Excel, of which Dr. Gullans, a member of our board of directors, is a Manager. Excel is also a holder of greater than 5% of our outstanding Common Stock. Cormorant Asset Management, LLC, a holder of greater than 5% of our Common Stock, is also a Selling Stockholder.

DESCRIPTION OF CAPITAL STOCK

The following is a summary of the material terms and some of the provisions of our third amended and restated certificate of incorporation and amended and restated bylaws and of the Delaware General Corporation Law as well as the registration rights under our amended investor rights agreement. This summary is not complete. For more detailed information, please see our third amended and restated certificate of incorporation, amended and restated bylaws and investor rights agreement, as amended, which are incorporated by reference as exhibits to the registration statement of which this prospectus is a part, as well as the relevant provisions of the Delaware General Corporation Law.

Our authorized capital stock consists of 100,000,000 shares of Common Stock, and 10,000,000 shares of preferred stock, par value \$0.001 per share. All of our authorized preferred stock is undesignated.

Common Stock

Voting Rights. Our Common Stock is entitled to one vote for each share held of record on all matters submitted to a vote of the stockholders, including the election of directors, and does not have cumulative voting rights. Accordingly, the holders of a plurality of the shares of our Common Stock present at the meeting and entitled to vote in any election of directors can elect all of the directors standing for election. For most other matters, the approval of a majority of the shares voting at an annual or special meeting of stockholders will be required. Exceptions to this include removing directors for cause and amending certain sections of our third amended and restated certificate of incorporation and amended and restated bylaws, each of which will require the approval of the holders of at least 66 2/3% of the voting power of all of our then outstanding capital stock.

Dividends. Subject to preferences that may be applicable to any then outstanding preferred stock, the holders of Common Stock are entitled to receive dividends, if any, as may be declared from time to time by our board of directors out of legally available funds. We have never issued a dividend on shares of our Common Stock and have no intention to do so in the future.

[Table of Contents](#)

Liquidation. In the event of our liquidation, dissolution or winding up, holders of our Common Stock will be entitled to share ratably in the net assets legally available for distribution to stockholders after the payment of all of our debts and other liabilities, subject to the satisfaction of any liquidation preference granted to the holders of any outstanding shares of preferred stock.

Rights and Preferences. Holders of our Common Stock have no preemptive, conversion or subscription rights, and there are no redemption or sinking fund provisions applicable to our Common Stock. The rights, preferences and privileges of the holders of our Common Stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of our preferred stock that we may designate and issue in the future.

Fully Paid and Nonassessable. All of our outstanding shares of Common Stock are fully paid and nonassessable.

Preferred Stock

Our board of directors is authorized, subject to limitations prescribed by Delaware law, without further action by the stockholders, to issue up to 10,000,000 shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each such series, to fix the rights, preferences and privileges of the shares of each wholly unissued series and any qualifications, limitations or restrictions thereon and to increase or decrease the number of shares of any such series, but not below the number of shares of such series then outstanding. Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of the Common Stock. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring or preventing a change in our control that may otherwise benefit holders of our Common Stock and may adversely affect the market price of the Common Stock and the voting and other rights of the holders of Common Stock.

We will fix the designations, voting powers, preferences and rights of the preferred stock of each series we may issue under this prospectus, as well as the qualifications, limitations or restrictions thereof, in the certificate of designation relating to that series. We will file as an exhibit to the registration statement of which this prospectus is a part, or will incorporate by reference from reports that we file with the SEC, the form of any certificate of designation that contains the terms of the series of preferred stock we are offering. We will describe in the applicable prospectus supplement the terms of the series of preferred stock being offered, including, to the extent applicable:

- the title and stated value;
- the number of shares we are offering;
- the liquidation preference per share;
- the purchase price;
- the dividend rate, period and payment date and method of calculation for dividends;
- whether dividends will be cumulative or non-cumulative and, if cumulative, the date from which dividends will accumulate;
- the procedures for any auction and remarketing, if applicable;

[Table of Contents](#)

- the provisions for a sinking fund, if applicable;
- the provisions for redemption or repurchase, if applicable, and any restrictions on our ability to exercise those redemption and repurchase rights;
- any listing of the preferred stock on any securities exchange or market;
- whether the preferred stock will be convertible into our Common Stock, and, if applicable, the conversion price, or how it will be calculated, and the conversion period;
- whether the preferred stock will be exchangeable into debt securities, and, if applicable, the exchange price, or how it will be calculated, and the exchange period;
- voting rights of the preferred stock;
- preemptive rights, if any;
- restrictions on transfer, sale or other assignment;
- whether interests in the preferred stock will be represented by depositary shares;
- a discussion of material United States federal income tax considerations applicable to the preferred stock;
- the relative ranking and preferences of the preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs;
- any limitations on the issuance of any class or series of preferred stock ranking senior to or on a parity with the series of preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs; and
- any other specific terms, preferences, rights or limitations of, or restrictions on, the preferred stock.

Registration Rights — Investors' Rights Agreement

Certain holders of our Common Stock, or their transferees, are entitled to the registration rights set forth below with respect to registration of the resale of such shares under the Securities Act pursuant to the investors' rights agreement by and among us and certain of our stockholders and convertible noteholders.

Demand Registration Rights

At any time upon the written request of certain of the holders of the registrable securities then outstanding that we file a registration statement under the Securities Act covering the registration of the registrable securities having an aggregate offering price to the public of not less than \$5 million, we will be obligated to notify all holders of registrable securities of such request and to use our reasonable best efforts to register the sale of all registrable securities that holders may request to be registered. We are not required to effect more than two registration statements which are declared or ordered effective. We may postpone the filing or effectiveness of a registration statement for up to 90 days once in any twelve month period if our board of directors determines in its good faith judgment that such registration and offering would materially and adversely affect us.

[Table of Contents](#)

“Piggyback” Registration Rights

If we register any securities for public sale, holders of registration rights will have the right to include their shares in the registration statement. These piggyback registration rights are subject to specified conditions and limitations, including the right of the underwriters of any underwritten offering to limit the number of shares having registration rights to be included in the registration statement, but not below 30% of the total number of shares included in the registration statement, except this offering, in which the holders may be entirely excluded.

Form S-3 Registration Rights

Holders of at least 20% of the outstanding registrable securities will have the right to demand that we file a registration statement on Form S-3 so long as the aggregate price to the public of the securities to be sold under the registration statement on Form S-3 is at least \$5 million. We are not required to effect more than two registrations on Form S-3 in any 12-month period. The right to have such shares registered on Form S-3 is further subject to other specified conditions and limitations. Upon such a request, we will be required to use our reasonable best efforts to file the registration as soon as practicable.

Expenses of Registration

Generally, we are required to bear all registration expenses incurred in connection with the demand, piggyback and Form S-3 registrations described above. All selling expenses incurred in connection with such registrations shall be borne by the holders of the securities so registered.

Expiration of Registration Rights

The demand, piggyback and Form S-3 registration rights discussed above will terminate upon the earlier of (i) five years following the closing of our initial public offering or (ii) after the consummation of a liquidation event or, as to any holder of registrable securities, the date on which such holder is able to dispose of all of its registrable securities in a single transaction pursuant to Rule 144 of the Securities Act.

Registration Rights — Registration Rights Agreement

In connection with the private placement we consummated in March 2017, certain holders of our Common Stock and the holders of our outstanding warrants are entitled to the registration rights set forth below with respect to registration of the resale of such shares under the Securities Act pursuant to the Registration Rights Agreement by and among us and the private placement investors.

We agreed to file, within 30 calendar days following the closing of the private placement, a registration statement on Form S-1 with the Commission covering the resale of the shares of Common Stock sold in the private placement and the shares of Common Stock underlying the Warrants. Such registration statement was filed with the Commission on April 13, 2017 and declared effective by the Commission on April 20, 2017. We also agreed to undertake to register the registrable securities on a registration statement on Form S-3 promptly after such form is available to us. In order to fulfill our contractual obligations under the Registration Rights Agreement, we filed the registration statement of which this prospectus forms a part to convert the prior registration statement on Form S-1 into Form S-3 for the registration of the PIPE Shares that remain unsold and to make certain other updating revisions to the information contained herein so that such information is current as of the date of filing of such registration statement. We have agreed to keep the registration statement continuously effective until the earlier of (i) such time as all of the registrable securities have been publicly sold by the holders or (ii) the date that all registrable securities may be sold by non-affiliates without volume or manner-of-sale

[Table of Contents](#)

restrictions pursuant to Rule 144, without the requirement that we are in compliance with the current public information requirement under Rule 144.

Anti-Takeover Provisions

Delaware Anti-Takeover Law

We are subject to Section 203 of the Delaware General Corporation Law, or Section 203. Section 203 generally prohibits a public Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a period of three years after the date of the transaction in which the person became an interested stockholder, unless:

- prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- the interested stockholder owned at least 85% of the voting stock of the corporation outstanding upon consummation of the transaction, excluding for purposes of determining the number of shares outstanding (a) shares owned by persons who are directors and also officers and (b) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or subsequent to the consummation of the transaction, the business combination is approved by the board of directors and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66 2/3% of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 defines a business combination to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, pledge or other disposition involving the interested stockholder of 10% or more of the assets of the corporation;
- subject to exceptions, any transaction involving the corporation that has the effect of increasing the proportionate share of the stock of any class or series of the corporation beneficially owned by the interested stockholder;
- subject to exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder; and
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

[Table of Contents](#)

In general, Section 203 defines an interested stockholder as any entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with or controlling or controlled by the entity or person.

Third Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws

Provisions of our third amended and restated certificate of incorporation and amended and restated bylaws may delay or discourage transactions involving an actual or potential change in our control or change in our management, including transactions in which stockholders might otherwise receive a premium for their shares or transactions that our stockholders might otherwise deem to be in their best interests. Therefore, these provisions could adversely affect the price of our Common Stock. Among other things, our third amended and restated certificate of incorporation and amended and restated bylaws:

- permit our board of directors to issue up to 10,000,000 shares of preferred stock, with any rights, preferences and privileges as they may designate;
- provide that the authorized number of directors may be changed only by resolution adopted by a majority of the board of directors;
- provide that the board of directors or any individual director may only be removed with cause and the affirmative vote of the holders of at least 66 2/3% of the voting power of all of our then outstanding capital stock;
- provide that all vacancies, including newly created directorships, may, except as otherwise required by law or subject to the rights of holders of preferred stock as designated from time to time, be filled by the affirmative vote of a majority of directors then in office, even if less than a quorum;
- divide our board of directors into three classes;
- require that any action to be taken by our stockholders must be effected at a duly called annual or special meeting of stockholders and not be taken by written consent or electronic transmission;
- provide that stockholders seeking to present proposals before a meeting of stockholders or to nominate candidates for election as directors at a meeting of stockholders must provide notice in writing in a timely manner and also specify requirements as to the form and content of a stockholder's notice;
- do not provide for cumulative voting rights, which means that holders of a majority of the shares of Common Stock entitled to vote in any election of directors can elect all of the directors standing for election;
- provide that special meetings of our stockholders may only be called by the chairman of the board of directors, our Chief Executive Officer or by the board of directors pursuant to a resolution adopted by a majority of the total number of authorized directors (whether or not any vacancies exist); and
- provide that the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors or officers to us or our stockholders,

[Table of Contents](#)

(iii) any action asserting a claim against us arising pursuant to any provision of the DGCL, or (iv) any action asserting a claim against us governed by the internal affairs doctrine.

The amendment of any of these provisions, with the exception of the ability of our board of directors to issue shares of preferred stock and designate any rights, preferences and privileges thereto, would require the affirmative vote of the holders of at least 66 2/3% of the voting power of all of our then outstanding capital stock.

Listing on the NASDAQ Global Market

Our Common Stock is listed on the NASDAQ Global Market the symbol “GEMP”.

Transfer Agent and Registrar

The transfer agent and registrar for our Common Stock is Computershare, Inc. The transfer agent and registrar’s address is 250 Royal Street, Canton, Massachusetts 02021 and the telephone number is 781-575-2000.

PLAN OF DISTRIBUTION

We are registering the shares of Common Stock issued to the Selling Stockholders and issuable upon exercise of the Warrants issued to the Selling Stockholders to permit the resale of those shares of Common Stock by such holders of Common Stock and Warrants from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the Selling Stockholders of the shares of Common Stock. We will bear all fees and expenses incident to our obligation to register the shares of Common Stock.

The Selling Stockholders may sell all or a portion of the shares of Common Stock beneficially owned by them and offered hereby from time to time directly or through one or more underwriters, broker-dealers or agents. If the shares of Common Stock are sold through underwriters or broker-dealers, the Selling Stockholders will be responsible for underwriting discounts or commissions or agent's commissions. The shares of Common Stock may be sold on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale, in the over-the-counter market or in transactions otherwise than on these exchanges or systems or in the over-the-counter market and in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions. The Selling Stockholders may use any one or more of the following methods when selling shares:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- settlement of short sales entered into after the effective date of the registration statement of which this prospectus is a part;
- broker-dealers may agree with the Selling Stockholders to sell a specified number of such shares at a stipulated price per share;
- through the writing or settlement of options or other hedging transactions, whether such options are listed on an options exchange or otherwise;
- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The Selling Stockholders also may resell all or a portion of the shares in open market transactions in reliance upon Rule 144 under the Securities Act, as permitted by that rule, or Section 4(a)(1) under the Securities Act, if available, rather than under this prospectus, provided that they meet the criteria and conform to the requirements of those provisions.

Broker dealers engaged by the Selling Stockholders may arrange for other broker dealers to participate in sales. If the Selling Stockholders effect such transactions by selling shares of Common Stock to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of discounts, concessions or commissions from the Selling Stockholders or commissions from purchasers of the shares of Common Stock for whom they may act as agent or to whom they may sell as principal. Such commissions will be in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction will not be in excess of a

[Table of Contents](#)

customary brokerage commission in compliance with FINRA Rule 2121 and Supplementary Material .01 and Supplementary Material .02 thereto.

In connection with sales of the shares of Common Stock or otherwise, the Selling Stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the shares of Common Stock in the course of hedging in positions they assume. The Selling Stockholders may also sell shares of Common Stock short and if such short sale shall take place after the date that this Registration Statement is declared effective by the Commission, the Selling Stockholders may deliver shares of Common Stock covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The Selling Stockholders may also loan or pledge shares of Common Stock to broker-dealers that in turn may sell such shares, to the extent permitted by applicable law. The Selling Stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction). Notwithstanding the foregoing, the Selling Stockholders have been advised that they may not use shares registered on this registration statement to cover short sales of our Common Stock made prior to the date the registration statement, of which this prospectus forms a part, has been declared effective by the SEC.

The Selling Stockholders may, from time to time, pledge or grant a security interest in some or all of the Warrants or shares of Common Stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of Common Stock from time to time pursuant to this prospectus or any amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act of 1933, as amended, amending, if necessary, the list of Selling Stockholders to include the pledgee, transferee or other successors in interest as Selling Stockholders under this prospectus. The Selling Stockholders also may transfer and donate the shares of Common Stock in other circumstances in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

The Selling Stockholders and any broker-dealer or agents participating in the distribution of the shares of Common Stock may be deemed to be “underwriters” within the meaning of Section 2(a)(11) of the Securities Act in connection with such sales. In such event, any commissions paid, or any discounts or concessions allowed to, any such broker-dealer or agent and any profit on the resale of the shares purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Selling Stockholders who are “underwriters” within the meaning of Section 2(a)(11) of the Securities Act will be subject to the applicable prospectus delivery requirements of the Securities Act including Rule 172 thereunder and may be subject to certain statutory liabilities of, including but not limited to, Sections 11, 12 and 17 of the Securities Act and Rule 10b-5 under the Securities Exchange Act of 1934, as amended (the “Exchange Act”).

Each Selling Stockholder has informed the Company that it is not a registered broker-dealer and does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the Common Stock. Upon the Company being notified in writing by a Selling Stockholder that any material arrangement has been entered into with a broker-dealer for the sale of Common Stock through a block trade, special offering, exchange distribution or secondary distribution or a purchase by a broker or dealer, a supplement to this prospectus will be filed, if required, pursuant to Rule 424(b) under the Securities Act, disclosing (i) the name of each such Selling Stockholder and of the participating broker-dealer(s), (ii) the number of shares involved, (iii) the price at which such the shares of Common Stock were sold, (iv) the commissions paid or discounts or concessions allowed to such broker-dealer(s), where applicable, (v) that such broker-dealer(s) did not conduct any investigation to verify the information set

[Table of Contents](#)

out or incorporated by reference in this prospectus, and (vi) other facts material to the transaction. In no event shall any broker-dealer receive fees, commissions and markups, which, in the aggregate, would exceed eight percent (8.0%).

Under the securities laws of some states, the shares of Common Stock may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the shares of Common Stock may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

There can be no assurance that any Selling Stockholder will sell any or all of the shares of Common Stock registered pursuant to the registration statement of which this prospectus forms a part.

Each Selling Stockholder and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including, without limitation, to the extent applicable, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the shares of Common Stock by the Selling Stockholder and any other participating person. To the extent applicable, Regulation M may also restrict the ability of any person engaged in the distribution of the shares of Common Stock to engage in market-making activities with respect to the shares of Common Stock. All of the foregoing may affect the marketability of the shares of Common Stock and the ability of any person or entity to engage in market-making activities with respect to the shares of Common Stock.

We will pay all expenses of the registration of the shares of Common Stock pursuant to the Registration Rights Agreement, including, without limitation, SEC filing fees and expenses of compliance with state securities or “blue sky” laws; provided, however, that each Selling Stockholder will pay all underwriting discounts and selling commissions, if any, and any related legal expenses incurred by it. We will indemnify the Selling Stockholders against certain liabilities, including some liabilities under the Securities Act, in accordance with the Registration Rights Agreement, or the Selling Stockholders will be entitled to contribution. We may be indemnified by the Selling Stockholders against civil liabilities, including liabilities under the Securities Act, that may arise from any written information furnished to us by the Selling Stockholders specifically for use in this prospectus, in accordance with the related Registration Rights Agreement, or we may be entitled to contribution.

LEGAL MATTERS

The validity of the shares of common stock offered hereby will be passed upon for us by Honigman Miller Schwartz and Cohn LLP, Kalamazoo, Michigan.

EXPERTS

Ernst & Young LLP, independent registered public accounting firm, has audited our financial statements and schedule included in our Annual Report on Form 10-K for the year ended December 31, 2016, which is incorporated by reference into this prospectus and elsewhere in the registration statement. The financial statements and schedule audited by Ernst & Young LLP have been incorporated by reference in reliance on their report given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

This prospectus is part of the registration statement on Form S-3 we filed with the SEC under the Securities Act and does not contain all the information set forth in the registration statement. Whenever a reference is made in this prospectus to any of our contracts, agreements or other documents, the reference may not be complete and you should refer to the exhibits that are a part of the registration statement or the exhibits to the reports or other documents incorporated by reference into this prospectus for a copy of such contract, agreement or other document. We file reports, proxy statements and other information with the SEC in accordance with the Exchange Act. You may read and copy our reports, proxy statements and other information filed by us at the public reference room of the SEC located at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information about the public reference rooms. Our reports, proxy statements and other information filed with the SEC are available free of charge to the public over the Internet at the SEC's website at <http://www.sec.gov>.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

SEC rules allow us to "incorporate by reference" into this prospectus much of the information we file with the SEC, which means that we can disclose important information to you by referring you to those publicly available documents. The information that we incorporate by reference into this prospectus is considered to be part of this prospectus. These documents may include Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, as well as proxy statements. You should read the information incorporated by reference because it is an important part of this prospectus.

This prospectus incorporates by reference the documents listed below, other than those documents or the portions of those documents deemed to be furnished and not filed in accordance with SEC rules:

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2016, filed with the SEC on March 21, 2017 (including information specifically incorporated by reference therein from our Proxy Statement filed with the SEC on April 6, 2017);
- our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2017 and June 30, 2017, which were filed on May 10, 2017 and August 14, 2017, respectively;
- our Current Reports on Form 8-K filed with the SEC on February 7, 2017, March 10, 2017, March 13, 2017, May 24, 2017, May 30, 2017, June 28, 2017, July 25, 2017 and August 7, 2017; and

[Table of Contents](#)

- the description of our Common Stock contained in our registration statement on Form 8-A filed on June 20, 2016, including any amendments or reports filed for the purpose of updating such description.

We also incorporate by reference into this prospectus all documents (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items) that are filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act (i) after the date of the initial filing of the registration statement of which this prospectus forms a part and prior to effectiveness of the registration statement, or (ii) after the date of this prospectus but prior to the termination of the offering. These documents include periodic reports, such as Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, as well as proxy statements.

Any statement contained herein or in a document incorporated or deemed to be incorporated by reference into this document will be deemed to be modified or superseded for purposes of the document to the extent that a statement contained in this document or any other subsequently filed document that is deemed to be incorporated by reference into this document modifies or supersedes the statement.

You can obtain any of the filings incorporated by reference in this prospectus on our website at www.gemphire.com. Information contained in, or accessible through, our website is not a part of this prospectus.

We will provide without charge to each person, including any beneficial owners, to whom this prospectus is delivered, upon his or her written or oral request, a copy of any or all reports or documents referred to above which have been or may be incorporated by reference into this prospectus but not delivered with this prospectus, excluding exhibits to those reports or documents unless they are specifically incorporated by reference into those documents. You may request a copy of these documents by writing or telephoning us at the following address.

Gemphire Therapeutics Inc.
17199 N. Laurel Park Dr., Suite 401
Livonia, Michigan 48152
(734) 245-1700
Attention: Jeffrey S. Mathiesen
Chief Financial Officer

PART II

INFORMATION NOT REQUIRED IN THE PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The following table sets forth an estimate of the fees and expenses payable by Gemphire Therapeutics Inc. (the “Registrant”) in connection with the issuance and distribution of the common stock being registered. All the amounts shown are estimates, except for the SEC registration fee.

| | AMOUNT PAID OR TO BE PAID |
|--|--------------------------------------|
| SEC registration fee | \$ 3,030 |
| Printing and engraving expenses | 25,000 |
| Legal fees and expenses | 185,000 |
| Accounting fees and expenses | 15,000 |
| Transfer agent and registrar fees and expenses | — |
| Miscellaneous expenses | 1,970 |
| Total | \$ 230,000 |

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

Item 15. Indemnification of Directors and Officers

The Registrant is incorporated under the laws of the State of Delaware. Section 145 of the Delaware General Corporation Law provides that a Delaware corporation may indemnify any persons who were, are, or are threatened to be made, parties to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of such corporation), by reason of the fact that such person is or was an officer, director, employee or agent of such corporation, or is or was serving at the request of such corporation as an officer, director, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys’ fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding, provided that such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the corporation’s best interests and, with respect to any criminal action or proceeding, had no reasonable cause to believe that his or her conduct was illegal. A Delaware corporation may indemnify any persons who were, are, or are threatened to be made, a party to any threatened, pending or completed action or suit by or in the right of the corporation by reason of the fact that such person is or was a director, officer, employee or agent of such corporation, or is or was serving at the request of such corporation as a director, officer, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys’ fees) actually and reasonably incurred by such person in connection with the defense or settlement of such action or suit provided such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the corporation’s best interests except that no indemnification is permitted without judicial approval if the officer or director is adjudged to be liable to the corporation. Where an officer or director is successful on the merits or otherwise in the defense of any action referred to above, the corporation must indemnify him or her against the expenses (including attorneys’ fees) actually and reasonably incurred.

The Registrant’s third amended and restated certificate of incorporation provides for the indemnification of its directors to the fullest extent permitted under the Delaware General Corporation Law. The

[Table of Contents](#)

Registrant's amended and restated bylaws provide for the indemnification of its directors and officers to the fullest extent permitted under the Delaware General Corporation Law.

Section 102(b)(7) of the Delaware General Corporation Law permits a corporation to provide in its certificate of incorporation that a director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duties as a director, except for liability for any:

- transaction from which the director derives an improper personal benefit;
- act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payment of dividends or redemption of shares; or
- breach of a director's duty of loyalty to the corporation or its stockholders.

The Registrant's third amended and restated certificate of incorporation includes such a provision. Under the Registrant's amended and restated bylaws, expenses incurred by any director or officers in defending any such action, suit or proceeding in advance of its final disposition shall be paid by the Registrant upon delivery to it of an undertaking, by or on behalf of such director or officer, to repay all amounts so advanced if it shall ultimately be determined that such director or officer is not entitled to be indemnified by the Registrant, as long as such undertaking remains required by the Delaware General Corporation Law.

Section 174 of the Delaware General Corporation Law provides, among other things, that a director who willfully or negligently approves of an unlawful payment of dividends or an unlawful stock purchase or redemption, may be held liable for such actions. A director who was either absent when the unlawful actions were approved or dissented at the time may avoid liability by causing his or her dissent to such actions to be entered in the books containing minutes of the meetings of the board of directors at the time such action occurred or immediately after such absent director receives notice of the unlawful acts.

As permitted by the Delaware General Corporation Law, we have entered into indemnity agreements with each of our directors and executive officers, that require us to indemnify such persons against any and all expenses (including reasonable attorneys' fees), witness fees, damages, judgments, fines, settlements and other amounts incurred (including expenses of a derivative action) in connection with any action, suit or proceeding, whether actual or threatened, to which any such person may be made a party by reason of the fact that such person is or was a director, an officer or an employee of Gemphire or any of its affiliated enterprises, provided that such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to our best interests and, with respect to any criminal proceeding, had no reasonable cause to believe his or her conduct was unlawful. The indemnification agreements also set forth certain procedures that will apply in the event of a claim for indemnification thereunder.

There is at present no pending litigation or proceeding involving any of the Registrant's directors or executive officers as to which indemnification is required or permitted, and the Registrant is not aware of any threatened litigation or proceeding that may result in a claim for indemnification.

The Registrant has an insurance policy in place that covers its officers and directors with respect to certain liabilities, including liabilities arising under the Securities Act or otherwise.

[Table of Contents](#)

Item 16. Exhibits

**Exhibit
Number**

- | | |
|------|---|
| 3.1 | Third Amended and Restated Certificate of Incorporation of Gemphire Therapeutics Inc. (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K, File No. 001-37809, filed on August 10, 2016). |
| 3.2 | Amended and Restated Bylaws of Gemphire Therapeutics Inc. (incorporated by reference to Exhibit 3.2 to the Registrant's Current Report on Form 8-K, File No. 001-37809, filed on August 10, 2016). |
| 4.1 | Form of Common Stock Certificate of the Registrant (incorporated by reference to Exhibit 4.1 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016). |
| 4.2 | Investor Rights Agreement, dated as of March 31, 2015, by and among the Registrant and the Investors listed therein as amended by First Amendment to Investor Rights Agreement, dated as of April 14, 2016 (incorporated by reference to Exhibit 4.2 to the Registrant's Registration Statement on Form S-1, File No. 333-210815, filed on April 18, 2016). |
| 4.3 | Form of Warrant (incorporated by reference to Exhibit 4.1 on the Registrant's Current Report on Form 8-K filed on March 13, 2017). |
| 5.1 | Opinion of Honigman Miller Schwartz and Cohn LLP (incorporated by reference to Exhibit 5.1 to the Registrant's Registration Statement on Form S-1, File No. 333-217296, filed on April 13, 2017). |
| 10.1 | Form of Securities Purchase Agreement, dated as of March 10, 2017 (incorporated by reference to Exhibit 10.1 on the Registrant's Current Report on Form 8-K filed on March 13, 2017). |
| 10.2 | Form of Registration Rights Agreement, dated as of March 10, 2017 (incorporated by reference to Exhibit 10.2 on the Registrant's Current Report on Form 8-K filed on March 13, 2017). |
| 23.1 | Consent of Ernst & Young LLP. |
| 23.2 | Consent of Honigman Miller Schwartz and Cohn LLP (contained in Exhibit 5.1). |
| 24.1 | Power of Attorney (included in signature page of the Registrant's Registration Statement on Form S-1, File No. 333-217296, filed on April 13, 2017). |

Item 17. Undertakings

1. The undersigned registrant hereby undertakes to file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement: (i) to include any prospectus required by Section 10(a)(3) of the Securities Act; (ii) to reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20% change in the

[Table of Contents](#)

maximum aggregate offering price set forth in the “Calculation of Registration Fee” table in the effective registration statement; and (iii) to include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement; *provided, however*, that paragraphs (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

2. The undersigned registrant hereby undertakes that, for the purpose of determining any liability under the Securities Act of 1933, as amended, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.
3. The undersigned registrant hereby undertakes to remove from registration by means of a post-effective amendment any of the securities being registered that remain unsold at the termination of the offering.
4. The undersigned registrant hereby undertakes that, for the purpose of determining liability under the Securities Act to any purchaser: (i) each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and (ii) each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.
5. The undersigned registrant hereby undertakes that, for the purposes of determining liability to any purchaser: if the registrant is subject to Rule 430C, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or

[Table of Contents](#)

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

6. Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Registrant pursuant to the foregoing provisions, or otherwise, the Registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer, or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question of whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.
7. The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to section 13(a) or section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

EXHIBIT INDEX

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Number**

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- 23.2 [Consent of Honigman Miller Schwartz and Cohn LLP \(contained in Exhibit 5.1\).](#)
- 24.1 [Power of Attorney \(included in signature page of the Registrant's Registration Statement on Form S-1, File No. 333-217296, filed on April 13, 2017\).](#)

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Livonia, State of Michigan, on September 1, 2017.

GEMPHIRE THERAPEUTICS INC.

By: /s/ STEVEN GULLANS
Steven Gullans, Ph.D.
Interim President and Chief Executive Officer

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

| <u>Signatures</u> | <u>Title</u> | <u>Date</u> |
|---|--|-------------------|
| <u>/s/ STEVEN GULLANS</u> Steven Gullans, Ph.D. | Interim President and Chief Executive Officer (Principal Executive Officer) | September 1, 2017 |
| <u>/s/ JEFFREY S. MATHIESEN</u> Jeffrey S. Mathiesen | Chief Financial Officer and Secretary (Principal Financial and Accounting Officer) | September 1, 2017 |
| <u>*</u> Charles L. Bisgaier, Ph.D. | Chief Scientific Officer and Chairman of the Board of Directors | September 1, 2017 |
| <u>*</u> P. Kent Hawryluk | Member of the Board of Directors | September 1, 2017 |
| <u>*</u> Kenneth Kousky | Member of the Board of Directors | September 1, 2017 |
| <u>*</u> Pedro Lichtinger | Member of the Board of Directors | September 1, 2017 |
| <u>*</u> Andrew Sassine | Member of the Board of Directors | September 1, 2017 |

* Pursuant to Power of Attorney.

By: /s/ JEFFREY S. MATHIESEN
Jeffrey S. Mathiesen
Attorney-in-Fact

Consent of Independent Registered Public Accounting Firm

We consent to the reference to our firm under the caption "Experts" in this Registration Statement (Form S-3) and related Prospectus of Gemphire Therapeutics Inc. for the registration of common stock, and to the incorporation by reference therein of our report dated March 20, 2017, with respect to the financial statements and schedule of Gemphire Therapeutics Inc. included in its Annual Report (Form 10-K) for the year ended December 31, 2016, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP
Detroit, Michigan
September 1, 2017
