
**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, DC 20549

Form 10-K

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended **December 31, 2016**

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF SECURITIES EXCHANGE ACT OF 1934
For the transition period from ____ to ____

Commission file number **001-37809**

Gemphire Therapeutics Inc.

(Exact name of Registrant as specified in its charter)

Delaware
(State or other jurisdiction of incorporation or organization)

47-2389984
(IRS Employer Identification No.)

17199 N. Laurel Park Drive, Suite 401, Livonia, MI
(Address of principal executive offices)

48152
(Zip Code)

(248) 681-9815
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Securities Exchange Act of 1934:

Title of Each Class
Common stock, \$0.001 par value

Name of Exchange on Which Registered
The NASDAQ Stock Market LLC

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark whether the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See definition of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

(Do not check if a smaller reporting company)

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12(b)-2 of the Securities Exchange Act of 1934). Yes No

The registrant was not a public company as of June 30, 2016, the last day of the registrant's most recently completed second quarter. The aggregate market value of the registrant's common stock held by non-affiliates of the registrant as of August 5, 2016, the initial trading date on the NASDAQ Global Market was \$30.3 million based on the closing price of the registrant's common stock of \$9.20, as reported by Nasdaq on that date. Shares of the registrant's common stock held by executive officers, directors and holders of 10% or more of the registrant's common stock have been excluded from this calculation because such persons may be deemed affiliates of the registrant; such exclusions do not reflect a determination that such persons are affiliates of the registrant for any other purpose.

The number of outstanding shares of the registrant's common stock, \$0.001 par value, as of March 3, 2017 was 9,272,582.

DOCUMENTS INCORPORATED BY REFERENCE

Parts of the Proxy Statement for the Registrant's 2017 Annual Meeting of Stockholders to be filed subsequently are incorporated by reference into Part III of this Annual Report on Form 10-K.

Gemphire Therapeutics Inc.
FORM 10-K
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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

Unless the context requires otherwise, references in this Annual Report on Form 10-K (this "Report") to "we," "us," "the Company" and "our" refer to Gemphire Therapeutics Inc.

This Report, including under the headings "Business," "Risk Factors," and "Management's Discussion and Analysis of Financial Condition and Results of Operations," contains 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 in this Report 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;
- § 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;
- § 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 of this Report and are subject to risks and uncertainties. We discuss many of these risks in greater detail under "Risk Factors." 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.

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.

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 of this Report, 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.

PART I

ITEM 1. BUSINESS

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) in 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) protein in the liver and may inhibit acetyl-CoA carboxylase (ACC) and HMG-CoA Synthase in the liver. Gemcabene has been tested as monotherapy and in combination with all doses of statins and other drugs in 895 subjects, which we define as healthy volunteers and patients, across 18 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.

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.

We believe gemcabene possesses a differentiated product profile compared to other therapies in the market and in clinical development. Key attributes of our product candidate include the following:

- **Cost-effective, once-daily, oral therapy.** Gemcabene is a small molecule formulated as a tablet and is cost effective to manufacture. As a once-daily, oral therapy, gemcabene, if approved, would be more convenient than other non-statin therapies, many of which require frequent injections or multiple daily doses. We expect to take a value-based approach to pricing across all the target indications.
- **Promising safety and tolerability.** Gemcabene was observed to be well tolerated in 895 subjects across 18 Phase 1 and Phase 2 trials both as monotherapy and in combination with statins. No subjects died and no subjects experienced a serious adverse event (SAE) that was considered to be related to gemcabene. Adverse events (AEs) reported were generally mild to moderate in intensity. Gemcabene did not appear to increase the reporting of myalgia (muscle pain) when added to statin therapy and no treatment related events of myalgia were reported in any gemcabene monotherapy arm in the dyslipidemia trials.

- **First-in-class mechanism.** Gemcabene's pleotropic mechanism of action hits multiple established targets that lower LDL-C, TG, and hsCRP in plasma. Gemcabene has been observed to reduce production of cholesterol and triglyceride pathways inside the liver. This gemcabene effect may be due to inhibition of acetyl CoA carboxylase (ACC) and HMG-CoA Synthase in the liver. Gemcabene has also been shown to enhance clearance of VLDL in the plasma. This is likely due to gemcabene's effect on reduction of apoC-III gene expression and reduction of plasma apoC-III levels, which may facilitate the uptake of VLDL remnants via hepatic remnant receptors. Gemcabene's effects on hsCRP may be due to its effect on reduction of IL-6 expression, as well as its direct effects on inhibiting transcription factors C/EBP- β and NF- κ B interaction with the CRP gene.
- **Significant lipid-lowering of LDL-C, high-sensitivity C-reactive protein (hsCRP) and triglycerides.** In Phase 2 trials, patients with hypercholesterolemia treated with gemcabene as monotherapy were observed to have significantly lowered LDL-C by approximately 30% from baseline and significantly lowered hsCRP by approximately 40% from baseline. In addition, patients with hypertriglyceridemia (≥ 200 mg/dL) were observed to have significantly lowered triglycerides by approximately 40%, and based on post-hoc analysis, gemcabene was observed to lower triglycerides by up to 60% in patients with severe triglyceride levels (≥ 500 mg/dL). Our product candidate's ability to meaningfully lower levels of multiple key lipids attributable to cardiovascular disease may expand its use across multiple indications within the dyslipidemia and NASH Market.
- **Additive effect in combination with statins.** In a Phase 2 trial in patients with uncontrolled hypercholesterolemia while on stable statin therapy (Trial 2017-018), gemcabene was observed to significantly lower LDL-C by an additional 25% to 31% from baseline. This data indicates that gemcabene may better treat a large population of patients who are unable to reach their lipid goal with statins and other currently prescribed therapies, including those medications commonly used for diabetes and NASH patients.
- **No drug-drug interactions when combined with high-intensity statin doses.** In two Phase 1 trials, gemcabene was tested in combination with high-intensity statin doses, 80 mg simvastatin and 80 mg atorvastatin. No clinically relevant drug-drug interactions were observed. In addition, gemcabene has been formulated as a fixed-dose combination tablet with various atorvastatin doses, which may offer additional convenience and compliance to patients.

We are pursuing gemcabene in the following indications (representing approximately 20 million addressable at-risk patients in the United States) as a treatment for: (1) dyslipidemia in patients on maximally tolerated statin therapy, unable to reach their lipid-lowering goal, and (2) in patients diagnosed with NASH as monotherapy or in combination with other approved treatments.

- homozygous familial hypercholesterolemia (HoFH), a rare genetic lipid disorder which results in elevated LDL-C usually due to mutations in both alleles, a pair of genes on a chromosome, responsible for a specific trait of the LDL-receptor gene. There are approximately 300-2,000 patients in the US and 6,000 to 45,000 patients worldwide;
- heterozygous familial hypercholesterolemia (HeFH), a more prevalent genetic lipid condition which results in elevated LDL-C usually due to a mutation in one allele of the LDL-receptor gene. The US population is estimated at .5M - 1.5M and an additional 15 - 30M worldwide;
- atherosclerotic cardiovascular disease (ASCVD), patients with hypercholesterolemia, or patients with elevated LDL-C who have had or are at risk for a cardiovascular event, such as heart attack, stroke, and/or revascularization. This is an estimated 10M patients in the US of which approximately half have mixed dyslipidemia. Worldwide estimates of ASCVD patients range from 100 - 120M;
- severe hypertriglyceridemia (SHTG), in which patients with elevated triglycerides are at an increased risk of developing co-morbidities such as pancreatitis. There are 3 - 3.5M patients in the US and another estimated 60 - 75M worldwide; and

· non-alcoholic steatohepatitis (NASH) and non-alcoholic fatty liver disease (NAFLD), are severe diseases of the liver caused by inflammation and a buildup of fat in the organ, which can lead to liver cirrhosis, fibrosis, hepatocellular carcinoma, liver failure, liver related death and liver transplantation. There is an estimated 80M patients with NAFLD and 6 to 8M patients with NASH in the US.

We initially began pursuing HoFH given that gemcabene has received orphan drug designation for this indication. We believe we can design an efficient development plan to provide a new treatment alternative for these patients. Furthermore, we believe that gemcabene’s potential ability to treat patients in the most severe segment of the dyslipidemia market, HoFH, can further enhance brand awareness among key thought leaders and physicians. We are in parallel developing gemcabene for HeFH, ASCVD, SHTG and NASH given gemcabene’s: (1) promising clinical data and mechanism in these indications; (2) cost-effective manufacturing process; (3) convenient oral dosing; (4) viability as safe adjunctive combination therapy; and (5) large commercial potential. By the end of 2017, we expect to report top-line data from all three dyslipidemia trials (COBALT-1, ROYAL-1 and INDIGO-1). We expect to initiate our clinical trial in NASH (AZURE-1) in 2017, with top-line data available in the second half of 2018.

Gemcabene Pipeline Indications

Indication	Phase 1	Phase 2a	Phase 2b	Phase 3	NDA	Anticipated Milestones
Homozygous Familial Hypercholesterolemia (HoFH)						COBALT-1 Phase 2b trial (n=8) ongoing and interim data provided January 30, 2017; top-line data expected in June 2017
Hypercholesterolemia – Heterozygous Familial Hypercholesterolemia (HeFH)						ROYAL-1 Phase 2b trial (n=104) ongoing and top-line data expected in 3Q 2017
Hypercholesterolemia – Atherosclerotic Cardiovascular Disease (ASCVD)						
Severe Hypertriglyceridemia (SHTG)						INDIGO-1 Phase 2b trial (n=90) ongoing and top-line data expected in 4Q 2017
Non-alcoholic Steatohepatitis (NASH) / Non-alcoholic Fatty Liver Disease (NAFLD)						AZURE-1 Phase 2 trial protocol designed with plans to enroll in 2H 2017; top-line data expected in 2H 2018

Upon completion of one or more of our trials, we intend to request one or more End of Phase 2 (EOP2) meetings with the U.S. Food and Drug Administration (FDA) to reach an agreement on the design of Phase 3 registration trials and long-term safety exposure for our target indications. We intend to pursue similar discussions with Canadian and European health authorities. Other markets will be considered as appropriate.

We believe it is unlikely the FDA will require us to initiate a cardiovascular outcomes trial for our target dyslipidemia indications. The FDA has not required the initiation or completion of cardiovascular outcomes trials for recent approvals of certain dyslipidemia therapies, including non-statin therapies targeting LDL-C for the treatment of HoFH, HeFH and ASCVD and triglyceride lowering for treatment of SHTG. Cardiovascular outcomes trials require evaluation of cardiovascular clinical conditions in large patient populations over a long period of time and are both costly and time-consuming. However, for commercial and competitive reasons, such as the potential to broaden the label claims, we intend to review with the FDA a design for a cardiovascular outcomes trial enriched with diabetic and obese (“diabesity”) patients which we may initiate before an NDA submission and complete post-approval.

Our company was co-founded by Dr. Charles Bisgaier, who was responsible for licensing exclusive worldwide rights to gemcabene from Pfizer in April 2011. Prior to co-founding the original Esperion Therapeutics, Inc. (Esperion) in 1998, which was acquired by Pfizer in 2004, Dr. Bisgaier worked at Parke-Davis, a division of Warner-Lambert Company from 1990 to 1998, and was instrumental in the discovery and development of gemcabene, as well as the development of Lipitor and Lopid. Many of our employees and consultants have been involved in the historical development of

gemcabene and other innovative dyslipidemia product candidates in development, including ETC-216, a synthetic high-density lipoprotein mimetic based on ApoAI-Milano (developed by the original Esperion, Pfizer, and currently The Medicines Company), ACP-501 (developed by AlphaCore Pharma, later acquired by AstraZeneca) and ETC-1002 (developed by the original Esperion, Pfizer and the current Esperion). We have organized a medical and scientific advisory board including Drs. John Kastelein, Evan Stein, Robert Hegele, Dirk Blom, Harold Bays, Peter Toth, Jay Horton, David Cohen, Rohit Loomba, Brian Krause, Gerald Watts, Todd Leff, and Kevin Williams, who combined have been involved in numerous dyslipidemia, cardiovascular and NASH clinical trials (e.g., statins from their earliest trials, fibrates, ezetimibe, cholesteryl ester transfer protein (CETP) inhibitors, extended release niacin, antisense oligonucleotides (mipomersen), monoclonal antibodies including PCSK9 inhibitors and multiple development stage NASH drugs) and published numerous research papers. The management team, led by our CEO Mina Sooch, collectively has significant experience in operating and financing biopharmaceutical companies and discovering, developing and commercializing treatments in the cardiovascular and orphan markets.

Our Strategy

Our goal is to become a leading cardiometabolic biopharmaceutical company that develops and commercializes best-in-class therapies for lipid disorders including dyslipidemia and NASH

The core elements of our strategy to achieve our goal are the following:

- ***Advance the late-stage clinical development of gemcabene across multiple target indications.*** We are focused on a broad spectrum of indications for dyslipidemia patients ranging from the orphan indication HoFH to more prevalent conditions, such as HeFH, ASCVD and SHTG. The data from our 18 Phase 1 and Phase 2 trials and multiple preclinical studies have provided us with a comprehensive set of information and key insights into gemcabene's mechanism of action, lipid-lowering effects and safety profile. Furthermore, recent approvals of cardiovascular therapies in gemcabene's target indications, such as biologic PCSK9 inhibitors for HoFH, HeFH and ASCVD and prescription fish oils for SHTG have provided us with a better understanding of current FDA views on approval of new dyslipidemia drugs. As a result, we believe that we have identified indications for gemcabene with favorable, precedent regulatory pathways and the highest likelihood of commercial success compared to other potential indications for gemcabene. By the end of 2017, we should read out our three late stage clinical dyslipidemia trials for gemcabene: an 8 patient open label trial for HoFH, a 104 patient trial for hypercholesterolemia on high-intensity statin therapy including HeFH and ASCVD patients, and a 90 patient trial for SHTG.
- ***Expand the breadth of indications beyond dyslipidemia for gemcabene.*** We are pursuing the utility of gemcabene in NASH and/or NAFLD given its mechanism of action that decreases the production of the apoC-III protein and may inhibit ACC, which has been observed to result in the lowering of triglycerides in the plasma and inhibiting de novo lipogenesis, and may reduce liver fat. We have completed pre-clinical testing for gemcabene in an established NASH preclinical model (STAM™) designed by SMC Laboratories of Japan. We expect to initiate our NASH trial (AZURE 1) in the second half of 2017.
- ***Pursue oral combination opportunities for gemcabene.*** Oral combination therapy is the current paradigm for the treatment of dyslipidemia (and expected for treatment of NASH), as patients typically require multiple drugs to address their dyslipidemia as well as other co-morbidities such as diabetes. Based on existing data demonstrating additive effects on LDL-C and triglyceride lowering as well as no drug-drug interactions with statins, we believe that gemcabene has the potential to be developed as a fixed-dose combination with low to high dose statins, which, if approved, may enhance adoption in the market and patient compliance. As part of our development strategy, we plan to formulate and manufacture gemcabene in fixed-dose combination with statins and other lipid-lowering agents.
- ***Continue to build out our patent portfolio for gemcabene.*** We believe our patents and patent applications provide us with a significant competitive advantage. As of February 20, 2017, we had 49 issued patents and 24 pending patent applications for gemcabene in the United States and internationally directed to formulations, compositions, methods of use and methods of manufacturing. We intend to aggressively prosecute and defend our patent portfolio and pursue new patents in order to ensure the long term commercial success of gemcabene.

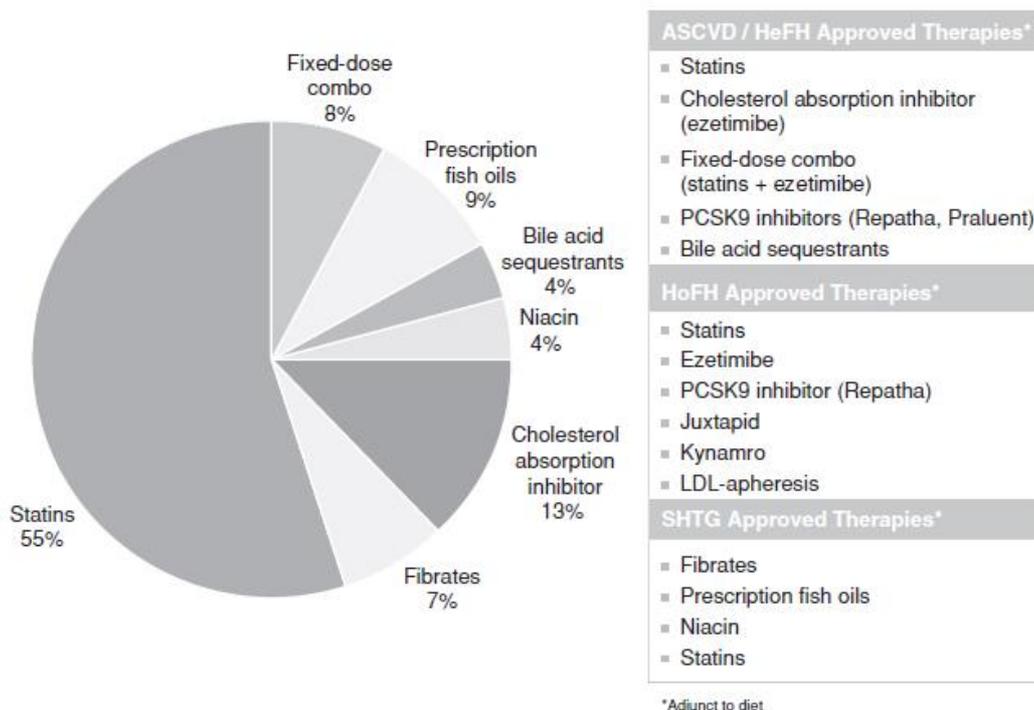
- **Maximize the global commercial value of gemcabene.** We have retained all commercial and manufacturing rights to gemcabene. We intend to evaluate our strategic alternatives to collaborate with global biopharmaceutical companies for the development and commercialization of gemcabene. We believe we could independently commercialize gemcabene for the treatment of patients with HoFH in the United States with a targeted sales force and would seek commercial partners outside of the United States. We may co-promote the SHTG indication with a partner with our internal sales force and distributor(s). For larger indications, such as HeFH, ASCVD, and NASH we would assess partnership opportunities for Phase 3 development and the worldwide commercialization of gemcabene.
- **Leverage the expertise and experience of our management team to evaluate future in-licensing and acquisition opportunities.** Across our leadership team, we have discovered and/or developed Lipitor, Lopid, ETC-1002, ETC-216, ACP-501, CER-209, CER-001 and PNT-2258, and commercialized many lipid regulating and orphan drugs including Crestor, Myalept and Lynparza. Our team is well-qualified to identify and in-license or acquire clinical-stage cardio-metabolic assets, and we intend to evaluate these opportunities to diversify our pipeline and generate long-term growth.

Overview of Dyslipidemia Market

According to the World Health Organization, cardiovascular disease is the number one cause of death in the world, responsible for 17.5 million, or approximately one in three, deaths in 2012. Cardiovascular disease is influenced by both environment and genetics. Environmental factors include diet, smoking, excess weight and sedentary lifestyle. Genetic defects can cause certain types of cardiovascular disease, such as familial hypercholesterolemia, a condition in which mutations on a gene are responsible for the elevated LDL-C levels in patients. Cardiovascular burden in the US is expanding at an alarming rate. The prevalence of CVD was in 41.5% in 2015, due to the rising effects of obesity and the earlier onset of type 2 diabetes. It is estimated that 45% of the US population will have at least one cardiovascular condition by 2035.

Dyslipidemia is characterized by an elevation of LDL-C, triglycerides or both. Dyslipidemia leads to cardiovascular disease and is generally an important predictor of cardiovascular events, including heart attack and stroke. It is estimated that 71 million American adults, or approximately 33%, have high LDL-C levels, which is a major risk factor for cardiovascular disease. We estimate from 2013 data that over 33 million patients are prescribed statins, of which a little more than half, or 19 million, are secondary prevention patients.¹ Of these 19 million secondary prevention patients, approximately 10 million are ASCVD patients who are not at their LDL-C goal. Furthermore, it is estimated that over 30% of American adults have elevated triglycerides above 150 mg/dL, and high levels of triglycerides are even evident in patients with normal cholesterol levels. If untreated, elevated triglycerides levels may lead to more serious illnesses, such as atherosclerosis (plaque build-up in the arteries) and severely elevated triglyceride levels may lead to pancreatitis (inflammation of the pancreas). The dyslipidemia market has achieved approximately \$22 billion in worldwide drug sales in 2013 and remains one of the largest therapeutic markets.

**Global Dyslipidemia Market
2013 Worldwide Drug Sales of \$22 Billion¹**



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Recent Developments in the Dyslipidemia Market

In 2015 there were key advisory panel meetings and regulatory approvals for non-statin LDL-C lowering drugs. Specifically, Biologics License Applications (BLAs) for two PCSK9 inhibitors were considered by the FDA and have subsequently been approved in the United States and Europe. We believe these approvals signal the FDA’s continued view that LDL-C lowering is an acceptable surrogate endpoint for traditional drug approval in certain lipid indications and that cardiovascular outcomes trials would not be required for such approvals. The FDA however noted that one should accept very little risk from a novel LDL-C-lowering drug when approving for a broad population only based on its effects on LDL-C. The approved PCSK9 products are described below. Their FDA-approved labels indicate that their effects on cardiovascular morbidity and mortality have not yet been determined.

- On August 27, 2015, Repatha®, developed by Amgen Inc. (Amgen), was approved in the United States for use along with diet and maximally tolerated statin therapy in adults with HoFH, HeFH and ASCVD, who need additional lowering of LDL-C.
- On July 24, 2015, Praluent®, developed by Regeneron Pharmaceuticals, Inc. (Regeneron) and Sanofi-Aventis U.S., LLC (Sanofi), was approved in the United States for use as adjunct to diet and maximally tolerated statin therapy for the treatment of adults with HeFH and ASCVD, who require additional lowering of LDL-C.

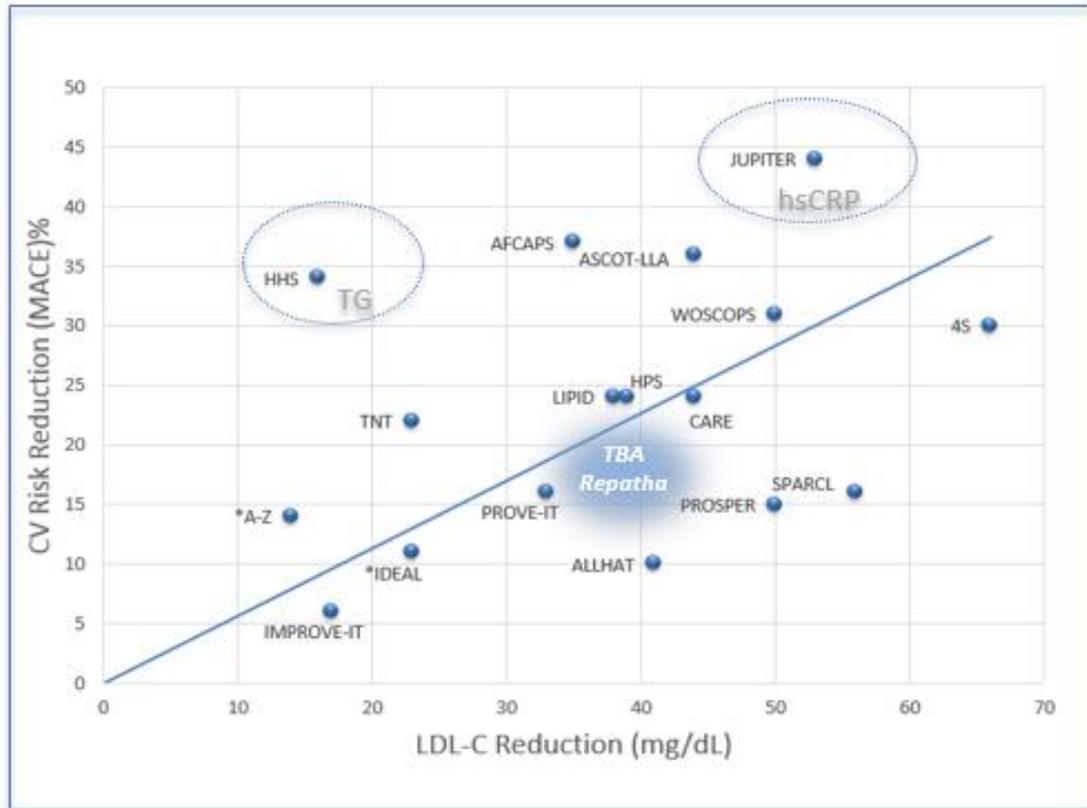
- On July 21, 2015 and September 28, 2015, the European Commission approved Repatha and Praluent respectively, each with a broader label compared to that in the United States. The approved indications in Europe included the treatment of adults with primary hypercholesterolemia or mixed dyslipidemia as: (1) combination therapy with maximally tolerated dose of statin or statin and other lipid-lowering drugs; or (2) monotherapy or combination therapy with other lipid-lowering drugs in patients who are statin-intolerant, or for whom statin is contraindicated. Repatha is also approved for the treatment of HoFH in adults and adolescents aged 12 years and over in combination with other lipid-lowering drugs.
- On November 1, 2016 Pfizer announced the discontinuation of the global clinical development program for bococizumab, its investigational Proprotein Convertase Subtilisin Kexin type 9 (PCSK9) inhibitor. The totality of clinical information now available for bococizumab, taken together with the evolving treatment and market landscape for lipid-lowering agents, led Pfizer to discontinue the development program, including the two ongoing SPIRE-1 and SPIRE-2 cardiovascular outcome studies.
- On February 2, 2017 Amgen announced that the FOURIER trial evaluating whether Repatha (evolocumab) reduces the risk of cardiovascular events in patients with clinically evident ASCVD met its primary composite endpoint (cardiovascular death, non-fatal myocardial infarction (MI), non-fatal stroke, hospitalization for unstable angina or coronary revascularization) and the key secondary composite endpoint (cardiovascular death, non-fatal MI or non-fatal stroke). No new safety issues were observed.

At the close of 2016, the sales of PCSK9 inhibitors Repatha and Praluent have been limited post-launch as a result of access being limited by pricing and payors.

Regulatory Precedents for Approval in Dyslipidemia Indications

Historical data suggest a linear relationship between LDL-C and cardiovascular disease, showing that lower LDL-C levels reduces the risk of mortality and other cardiovascular events (for example, every 39 mg/dL LDL-C lowering results in 24% cardiovascular risk reduction). The chart below by Cholesterol Treatment Trialists' (CTT) Collaboration provides the foundation for this 'LDL-C hypothesis'.

**Lowering LDL-C Decreases Cardiovascular Risk
Elevated LDL-C lowering is the #1 Modifiable Risk Factor**



Sources: CTT Cholesterol Treatment Trialist's Collaboration and Study Papers for each Trial

CV = Cardiovascular; MACE=Major Adverse Cardiovascular Events

* A-Z p=.14 and IDEAL p=.07

Key For LDL-C Lowering Drug with Successful Trial Results: **Gemfibrozil:** HHS; **Atorvastatin:** IDEAL, TNT, PROVE-IT, ASCOT-LLA, SPARCL; **Pravastatin:** ALLHAT, CARE, PROSPER, LIPID, WOSCOPS; **Simvastatin:** A-Z, HPS, 4S; **Lovastatin:** AFCAPS; **Rosuvastatin:** JUPITER; **Ezetimibe:** IMPROVE-IT.

For nearly three decades (1987 to 2015), the FDA has accepted LDL-C lowering as a surrogate endpoint for reducing cardiovascular risk for *traditional* approval on over 15 lipid-lowering drugs without requirements to initiate or complete a cardiovascular outcomes trial. Traditional approval may be based on surrogate endpoints such as LDL-C and blood pressure that are *known* to predict clinical benefit, in contrast to accelerated approval based on surrogate endpoints that are only *reasonably likely* to predict clinical benefit and require confirmatory evidence of actual benefit after approval. With traditional approval based on LDL-C reduction, the FDA does not have a regulatory mechanism to require any further efficacy trials and does not require sponsors to conduct a post-approval cardiovascular outcomes trial. Sponsors who have chosen to conduct cardiovascular outcomes trials before or after traditional approval, which is encouraged by the FDA, have voluntarily done so to seek additional claims.

In approving drugs, the FDA considers the magnitude of effect in relation to the safety profile. Not only has the use of LDL-C as a surrogate marker to predict the risk of cardiovascular events been accepted by the FDA but the importance

of LDL-C lowering has also been recognized by clinical organizations such as American College of Cardiology, American Heart Association (AHA), National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP-III), American Association of Clinical Endocrinologists, and National Lipid Association.

These approvals have occurred over the last decade, as have studies showing that certain LDL-C lowering statin and non-statin drugs did not in fact provide cardiovascular benefits (e.g., Niacin in AIM-HIGH trial) and/or show unexpected safety concerns (e.g., ezetimibe in ENHANCE with cancer). In addition, a class of drugs known as cholesteryl ester transfer protein inhibitors (CETPi) with a different mechanism (which increases high-density lipoprotein cholesterol (HDL-C) while sometimes lowering LDL-C), has 3 drugs that failed to demonstrate efficacy in Phase 3 cardiovascular outcome trials. The first CETPi drug, Pfizer's torcetrapib, lowered LDL-C but showed increased cardiovascular event rates in patients due to off-target effects in ILLUMINATE, which we believe established a higher FDA standard for cardiovascular outcomes trials for the CETPi class.

In patient populations such as HoFH and SHTG, we believe the FDA recognizes that an outcomes trial would be difficult and as a result has established precedent drug approvals over time based on surrogate endpoints (LDL-C for cardiovascular risk and triglycerides for pancreatitis risk, respectively). Recent examples include Juxtapid (2012), Kynamro (2013) and Repatha (2015) for HoFH and Vascepa (2012) for SHTG.

In the broader populations HeFH and ASCVD, the FDA recently approved PCSK9 inhibitors based on LDL-C as the surrogate endpoint and did not require the completion of cardiovascular outcomes trial in these high-risk dyslipidemia patients. The FDA approved Praluent and Repatha based on LDL-C reduction as an adjunct to maximally tolerated statin therapy (and diet), but did not approve these drugs for monotherapy or primary patients, noting that such approval may be premature in the absence of cardiovascular outcomes data.

Collectively, recent approvals of new cardiovascular drugs, results from clinical trials of non-statin product candidates, and our recent regulatory guidance that we received from the FDA regarding our development plans have provided us with some assurance that LDL-C lowering product candidates in development, such as gemcabene, will not be required to conduct cardiovascular outcomes trials in the United States and Europe prior to approval for our target indications planned in combination with statins assuming a favorable benefit/risk profile.

hsCRP Biomarker of Interest

Inflammation plays a significant role in the propagation of atherosclerosis and susceptibility to cardiovascular events. Of the wide array of inflammatory biomarkers that have been studied, hsCRP (or CRP) has received the most attention for its use in risk reclassification of cardiovascular disease. Recently, at the 2015 European Society for Cardiology meeting, Merck presented a post-hoc analysis of the IMPROVE-IT trial which confirmed the importance of lowering both LDL-C and hsCRP levels to below 70 mg/dL and 2 mg/L, respectively, with a 27% relative risk reduction in cardiovascular events occurring in patients that were able to attain these target levels compared to those patients who achieved neither of these target levels. These findings support the potential for novel non-statin therapies that can demonstrate clinical efficacy in both LDL-C and hsCRP reduction. Gemcabene's ability to substantially lower hsCRP in conjunction with LDL-C may offer further benefit to the cardiovascular health of patients.

Overview of NASH Market

NASH is an advanced form of NAFLD in which a buildup of excess triglycerides in the liver (steatosis), usually in the context of metabolic dysregulation, results in liver damage (hepatocyte ballooning) and increased inflammation. This condition can lead to hepatic fibrosis and cirrhosis and eventually hepatocellular carcinoma (HCC) in some patients. NASH is now one of the most common causes for liver transplantation. There are currently no approved medications for treating NASH in any market across the globe. Disease management chiefly involves lifestyle modification, some off-label medication use, and monitoring for disease progression. Off-label medications typically include antioxidant, antidiabetic, and lipid modifying agents. Despite the potentially serious liver complications, the natural progression of NASH is relatively slow, and CV disease is the leading cause of death among NASH patients, partly as a result of the disease and partly due to the common comorbidities in patients with NASH, including type 2 diabetes and obesity. NASH is now the second most common cause for liver transplantation in the U.S. and it is anticipated to become the leading cause by 2020.

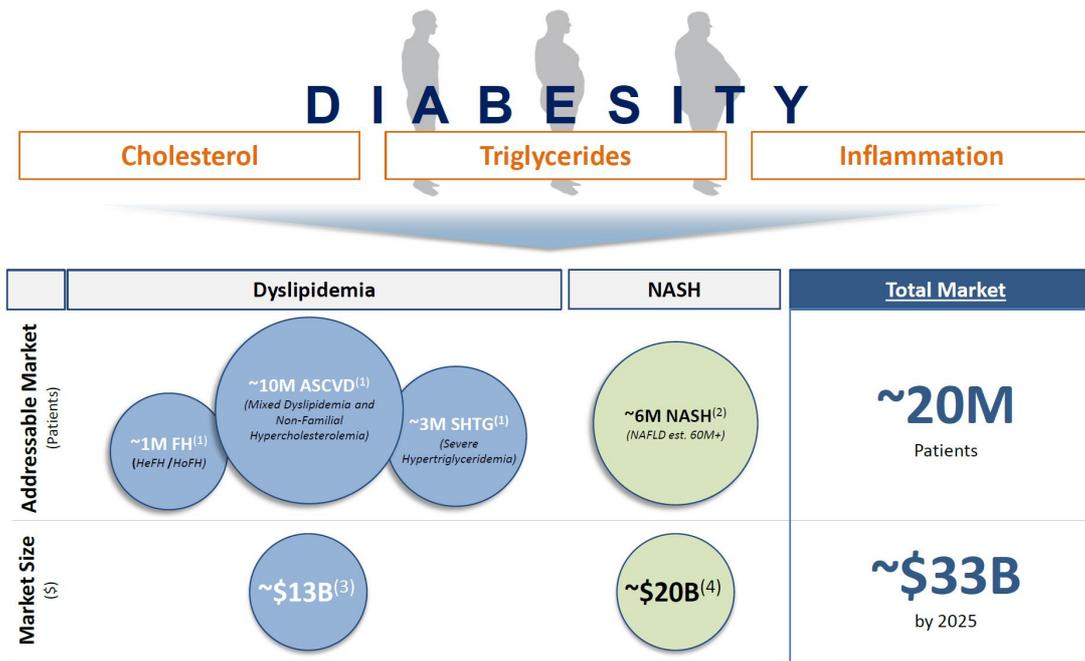
Regulatory Trends for Approval in NASH

As the NASH competitive landscape matures, the clinical and regulatory pathways are evolving. In February of 2017, the FDA approved a significant amendment to Intercept Pharmaceuticals, Inc.’s obeticholic acid (OCA) protocol signaling potential standards for future NASH trials: (1) only one primary endpoint is required for success – either improvement in fibrosis or NASH resolution – but not both; and (2) the FDA agreed upon an objective definition of NASH resolution.

Our Target Indications

We believe that oral, once-daily gemcabene as an add-on to statin and other existing therapies is differentiated by the ability to lower multiple risk factors (LDL-C, hsCRP and triglycerides) and, if approved, presents a significant opportunity across multiple indications in dyslipidemia and NASH. These indications span from HoFH to more prevalent conditions, such as HeFH, ASCVD, SHTG and NASH, in which therapies are required to reduce elevated levels of LDL-C, triglycerides, inflammation or any combination thereof. Our target indications are summarized below with a total of approximately 14 million addressable dyslipidemia patients in the United States who could be treated with gemcabene, and another six million patients with NASH in the U.S.

Patient Related Large Markets for Dyslipidemia and NASH



1) Company estimate based on DRG Market Data, NHANES and FH Foundation.
 2) The National Institute of Diabetes and Digestive and Kidney Diseases, 2016
 3) Decision Resources Group 2015 report
 4) Transparency Market Research (April 2016)

Homozygous Familial Hypercholesterolemia (HoFH)

HoFH is a rare genetic disease that is usually caused by mutation in both alleles of the LDL receptor gene responsible for removing LDL from the blood. As a result of having defective or deficient LDL receptor function, HoFH patients exhibit severely high LDL-C levels, are at very high risk of experiencing premature cardiovascular events, such as a heart attack or stroke, and develop premature and progressive atherosclerosis. LDL-C levels in HoFH patients are often in the range of 500 mg/dL to 1,000 mg/dL, compared to a normal target range of 70 mg/dL to 100 mg/dL. Unless treated, most patients with HoFH do not survive adulthood beyond 30 years of age. There are approximately 300 to 2,000 HoFH

patients in the United States and 6,000 to 45,000 patients in the rest of the world based on an estimated prevalence rate of one in 160,000 to one in one million.

Current available treatments for HoFH generally include a combination of dietary intervention, statins, ezetimibe and other approved LDL-C lowering therapies, including lipoprotein apheresis. However, even when combination therapies are utilized, many patients still have high LDL-C levels and are still at high risk of cardiovascular disease. The FDA has approved two non-statin therapies for HoFH, Juxtapid, marketed by Aegerion Pharmaceuticals, Inc. (Aegerion), and Kynamro, marketed by Sanofi. Although these drugs have demonstrated efficacy, they have significant safety and tolerability concerns, including boxed warnings for liver toxicity on the product labels. Recently, the FDA has also approved Amgen's PCSK9 inhibitor, Repatha, for HoFH patients, but this therapy has limitations due to its mechanism of action reliant on functional LDL-receptors. In clinical trials, Repatha has shown substantially less LDL-C lowering from baseline in patients with HoFH compared to LDL-C lowering in patients with other hypercholesterolemia indications.

On February 6, 2014, gemcabene received orphan drug designation by the FDA for treatment of HoFH. We believe that pursuing the HoFH indication may enable gemcabene to reach the market sooner than for other indications due to: (1) approval pathway based on a single, small Phase 3 trial; (2) no requirement for cardiovascular outcomes trials; and (3) potential for priority review by the FDA in light of the unmet medical need in this orphan population. Furthermore, we believe that gemcabene's potential to treat patients in the most severe segment of the dyslipidemia market on top of statins and other lipid-lowering therapies (including ezetimibe and Repatha) will enhance brand awareness among key thought leaders and physicians.

Heterozygous Familial Hypercholesterolemia (HeFH)

The HeFH patient population is generally comprised of individuals who have one defective gene that leads to elevated LDL-C levels between 190 mg/dL and 500 mg/dL. These patients are prone to premature cardiovascular events. The incidence of patients with HeFH is estimated to be one in 200 and one in 500, and, accordingly, we estimate there are approximately 0.5 to 1.5 million patients with HeFH in the United States and 15 to 30 million in the rest of the world.

Current approved treatments for HeFH include statins, ezetimibe, bile acid sequestrants and the recently approved injectable PCSK9 inhibitors. Despite the availability of various treatments, many patients are still unable to achieve recommended LDL-C levels. In addition, patients, physicians and payors may prefer more convenient, cost-effective, oral drugs.

We believe obtaining approval for the HeFH indication will enable gemcabene to reach a large market of patients with the inability to attain their LDL-C goal using current therapies (including high-intensity statins, ezetimibe and PCSK9 inhibitors). An approval in HeFH would allow gemcabene to be introduced into another indication for very high LDL-C levels and enable physicians globally to have another oral, once-daily, cost-effective, well-tolerated with high intensity statins option in treating this complex patient population, while also lowering LDL-C, hsCRP, and triglycerides.

Atherosclerotic Cardiovascular Disease (ASCVD)

ASCVD represents patients who have experienced or are at risk of a cardiovascular event and are unable to meet their LDL-C lowering goal of less than 70 mg/dL with maximally tolerated statin therapy. This population also includes many patients who, in addition to not being able to meet their LDL-C lowering goal, have elevated triglyceride levels greater than 150 mg/dL and less than 500 mg/dL, categorized as mixed dyslipidemia. We estimate that approximately 10 million patients in the United States and 200 million patients in the rest of the world have a need for additional therapies to effectively and safely bring them closer to their LDL-C and triglyceride lowering goals.

Currently approved treatments for both primary hypercholesterolemia and ASCVD include statins, ezetimibe, bile acid sequestrants, niacin, fibrates and recently approved PCSK9 inhibitors. While these drugs have demonstrated efficacy in lipid-lowering in this population, they do not sufficiently address the patients with mixed dyslipidemia who need to lower both LDL-C and triglycerides.

We believe that there is a meaningful number of underserved ASCVD patients who are: (1) unable to reach LDL-C and triglyceride goals on maximally tolerated statin therapy; (2) require LDL-C reduction beyond the 6% reduction observed when statin dose is doubled; or (3) unable to tolerate higher doses of statins. If gemcabene is approved for this

indication, it may potentially offer patients, especially diabetes patients, a preferred well-tolerated combination therapy with a statin and/or ezetimibe that is convenient, oral, once-daily, cost effective, and effective in achieving LDL-C, hsCRP and triglyceride goals.

Severe Hypertriglyceridemia (SHTG)

Elevated triglycerides are often caused by an inherited disorder or exacerbated by uncontrolled diabetes mellitus, obesity, hypothyroidism and sedentary habits. A recent scientific statement on “Triglycerides and Cardiovascular Disease” issued by the American Heart Association based on a review of the pivotal role of triglycerides in lipid metabolism, reaffirmed that triglycerides are not directly atherogenic, but represent an important biomarker of cardiovascular disease. Patients with severe triglycerides greater than 500 mg/dL, or SHTG, have increased risk of developing pancreatitis, a painful and potentially life-threatening inflammation of the pancreas. Based on a 1.1% prevalence rate in the United States, as published by the American Heart Association, we estimate there are approximately 3.5 million patients with SHTG in the United States and 75 million patients in the rest of the world.

Current available treatments for SHTG consist of dietary modifications to lower the intake of fatty foods and the use of fibrates, prescription fish oils and niacin. These treatments are often inadequate in lowering triglyceride levels below 500 mg/dL, the level at which patients are at an increased risk for developing pancreatitis. Due to the severely elevated triglyceride levels in this patient population, reducing triglyceride levels below 500 mg/dL may require reductions in triglyceride levels of 40% or more. Current therapies, even in combination, are often insufficient in achieving such a result. In addition, many of the existing treatments do not combine well with statins for treating SHTG.

We believe that pursuing SHTG may enable gemcabene to reach a large population of patients with triglyceride levels above 500 mg/dL and offer a convenient, oral, once-daily dosing with no food effects that may have the potential to result in better efficacy than standard of care, while being well-tolerated with statins.

Non-alcoholic Steatohepatitis (NASH)

NASH is a severe disease of the liver caused by inflammation and a buildup of fat in the organ. In the United States, NASH affects up to approximately 2-5% of the population roughly at 6 million NASH patients. An additional 10-30% of Americans have fat in their liver, but no inflammation or liver damage, a condition called NAFLD or “fatty liver.” The underlying cause of NASH is unclear, but it most often occurs in persons who are middle-aged and overweight or obese. Many patients with NASH have elevated serum lipids, diabetes or pre-diabetes. Progression of NAFLD/NASH can lead to liver cirrhosis, fibrosis, hepatocellular carcinoma, liver failure and liver-related death. Liver transplantation is currently the only treatment for advanced cirrhosis with liver failure.

At this time, there are no approved treatments by the FDA for NAFLD/NASH. Based on the current understanding of pathophysiological mechanisms associated with NASH, several compounds are in clinical development, although none have been approved to date. The Clinical Trials website lists many trials for NASH. These compounds target the regulation of dyslipidemia (e.g. acetyl CoA carboxylase inhibitors, bile acid/fatty acid conjugates), inflammation (e.g. combined CCR2/CCR5 inhibitor) and/or fibrosis (e.g. 6-ethylchenodeoxycholic acid).

Gemcabene may be effective in treating patients for NASH given its mechanism of action around inflammation and triglycerides, especially for diabetes patients. Gemcabene will likely be used as an oral combination with statins and other to be approved NASH drugs with complementary mechanisms.

Our Product Candidate — Gemcabene

Our product candidate, gemcabene, is a novel, once-daily, oral therapy designed to target known lipid metabolic pathways to lower levels of LDL-C, hsCRP and triglycerides. Gemcabene shares many of the attributes of statin therapy, including broad therapeutic applications, convenient route of administration and cost-effective manufacturing process, but does not appear to increase the reporting of myalgia when added to statin therapy. Gemcabene has also shown additive LDL-C lowering in combination with stable low, moderate or high-intensity statin therapy. We also plan to develop a fixed-dose combination product of gemcabene with atorvastatin to enhance market adoption and maximize the likelihood of commercial success.

We are developing multiple indications for gemcabene, ranging from HoFH, an orphan indication, to more prevalent conditions, such as HeFH, ASCVD, SHTG and NASH. By the end of 2017, we should read out all three late stage dyslipidemia clinical trials for gemcabene: an 8 patient trial for HoFH (COBALT-1), a 104 patient trial for hypercholesterolemia on high-intensity statin therapy including HeFH and ASCVD patients (ROYAL-1), and a 90 patient trial for SHTG (INDIGO-1). In addition, we expect to launch our NASH clinical trial (AZURE-1) in the second half of 2017.

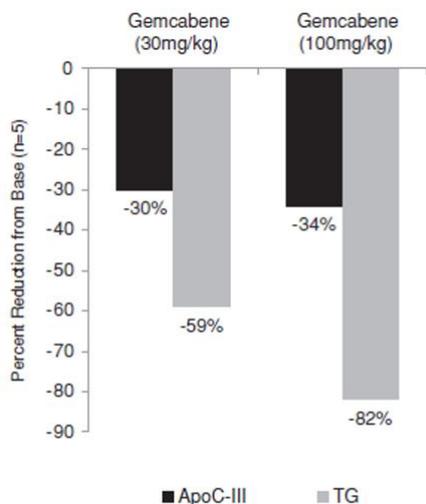
We licensed global rights to gemcabene from Pfizer in April 2011. We will continue to leverage the extensive preclinical, clinical, manufacturing and formulation work previously conducted to further advance the development of gemcabene.

Mechanism of Action

Gemcabene has a mechanism of action that involves: (1) enhancing the clearance of VLDL; and (2) blocking the overall production of hepatic triglyceride and cholesterol synthesis. Based on prior clinical trials, the combined effect for these mechanisms has been observed to result in a reduction of plasma VLDL-C, LDL-C, triglycerides and hsCRP, as well as elevation of HDL-C. Gemcabene mainly distributes to the liver where it has its effect as the active molecule.

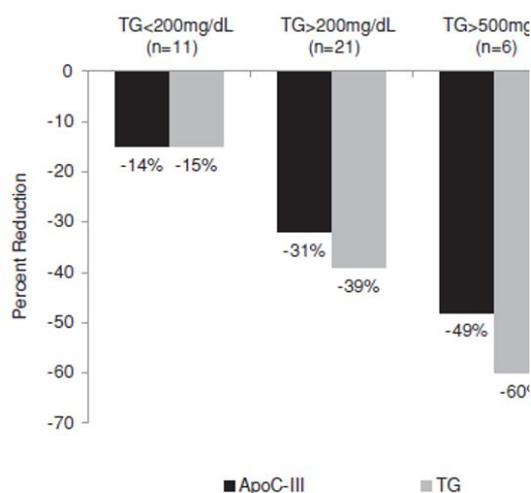
- (1) ApoC-III protein is known to be causal in cardiovascular disease. Gemcabene enhances VLDL clearance by decreasing apoC-III messenger RNA (mRNA) expression, thereby reducing apoC-III protein production and plasma levels. ApoC-III is a small protein (~9 kDa) that inhibits hepatic uptake of triglyceride-rich particles such as VLDL. VLDL lipoproteins are catabolized to VLDL remnants in plasma. The VLDL remnants are either cleared from the plasma via remnant receptors or are further catabolized to LDL. The reduction in apoC-III exposes apolipoprotein E (apoE), a 35 kDa protein that is also present on the VLDL lipoproteins and VLDL remnants. ApoE is essential for the normal catabolism of triglyceride-rich particles. This favors the enhanced clearance of the VLDL remnants via ApoE remnant receptors and reduces the formation of LDL particles, while also breaking down triglycerides by lipoprotein lipase to deliver more fatty acids to muscle and adipose tissue. We have observed in preclinical studies that gemcabene significantly clears VLDL in the plasma with corresponding reductions in the liver apoC-III mRNA levels and apoC-III plasma protein levels in rats. In a hypertriglyceridemic human clinical trial, gemcabene was shown to significantly decrease both apoC-III and triglycerides.

Reduction of Plasma ApoC-III and TG



Gemcabene Effect on Plasma Triglycerides and Apolipoproteins in the Male Sprague-Dawley Rat (One-Week Exposure)

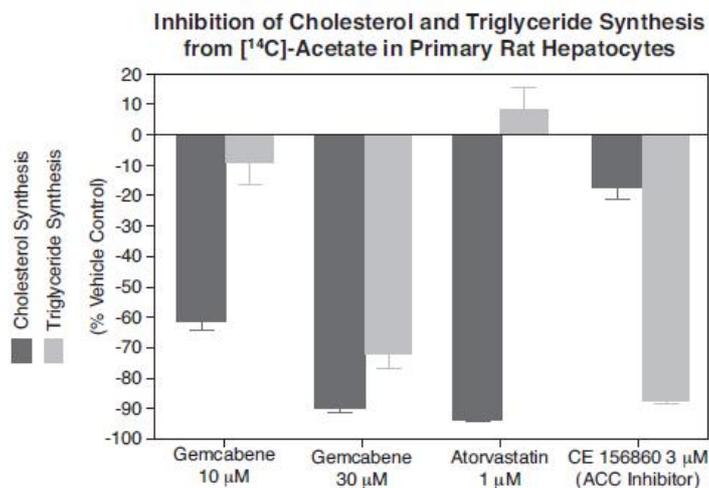
Reduction of Plasma ApoC-III and TG in Humans



Gemcabene's (300mg/day) Reduction of Plasma ApoC-III and Plasma Triglycerides (Study 1027-004, 12 weeks)

- (2) Gemcabene reduces *de novo* lipogenesis through both hepatic cholesterol and TG synthesis, which lowers TG-rich lipoproteins (e.g., VLDLs) and their metabolic product (LDL) in the plasma. Gemcabene has been shown to inhibit radiolabeled acetate incorporation into TG and cholesterol in primary rat hepatocytes in culture and in the liver of mice, supporting gemcabene's mechanism of action by inhibition of the synthesis of both fatty acids and cholesterol. Gemcabene may act as an inhibitor of ACC targeting the rate-limiting enzyme in fatty acid synthesis, subsequently leading to a decreased hepatic triglyceride production. Gemcabene, also appears to inhibit HMGCoA synthase, an early step in the cholesterol synthesis pathway.

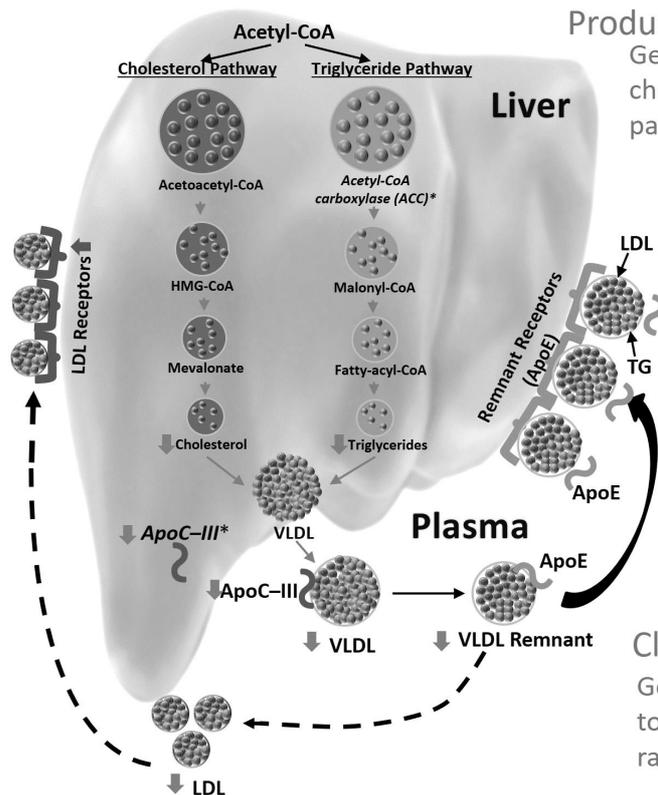
Gemcabene Inhibits *de novo* Synthesis of Both Cholesterol and Triglycerides



Source: Research Report 76100065 (2013)

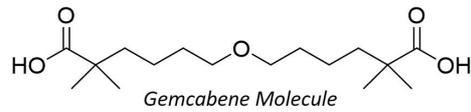
The diagram below depicts the novel mechanisms of gemcabene. We will continue to undertake preclinical studies to further clarify gemcabene's involvement in various metabolic pathways.

Gemcabene Novel Mechanism of Action



Production Mechanism:

Gemcabene reduces production of cholesterol and triglycerides pathways inside the liver



- Plasma half-life of 32 to 41 hours
- Liver is target organ
- Gemcabene is the active compound
- Renal elimination

**Potential molecular targets in the liver (ApoC-III, ACC)*

Clearance Mechanism:

Gemcabene clears VLDL efficiently due to a reduction in ApoC-III followed by rapid uptake by the remnant receptor

In addition, we believe gemcabene may result in the reduction of inflammation, inflammatory markers and triglycerides (as a result of reduced apoC-III production) in the plasma of a patient in an inflammatory state. C-reactive Protein (CRP) is an inflammatory marker protein. CRP levels increase in response to inflammatory states and are associated with medical conditions such as atherosclerosis and other cardiovascular diseases, arthritis, hypertension, obesity, insulin resistance, and fatty liver disease. CRP expression is regulated by proteins in the nucleus of cells known as nuclear hormone receptors (NHRs). In inflammatory states, cytokines, such as interleukin-6 (IL-6) and interleukin (IL-1 β), activate NHRs, such as C/EPB- β , C/EPB- δ and nuclear factor kappa B (NF- κ B), and lead them to bind to the CRP promoter and increase CRP mRNA production. Based on preclinical studies, gemcabene may inhibit the interaction of these NHRs on the CRP promoter and therefore reduce CRP mRNA production. Gemcabene has also been shown in preclinical studies to inhibit tissue necrosis factor- α (TNF- α) induced expression of the inflammatory cytokine IL-6 in human coronary artery endothelial cells and in a human hepatoma cell line. Overall, gemcabene may not only decrease the expression of CRP, but may also decrease the expression of the inflammatory cytokine IL-6 resulting in a reduction of inflammation. Gemcabene has been shown to reduce the level of CRP in human clinical trials, to decrease inflammation in a mouse model of arthritis, a mouse model of NASH, and to decrease pain in a rat model of thermal hyperalgesia.

The apoC-III promoter also contains a NF- κ B binding site, and as such, the apoC-III gene may be upregulated under a chronic inflammatory state. Gemcabene's ability to reduce apoC-III mRNA levels may result from gemcabene inhibiting NF- κ B interaction with its binding site on the apoC-III promoter. We are further exploring this common transcription factor NF- κ B as a binding site for gemcabene to reduce hsCRP and apoC-III. In contrast, Gemcabene has not been shown to directly or strongly bind to PPARs. See "Additional Studies and Trials."

Clinical Experience

Gemcabene has been assessed in 18 Phase 1 and Phase 2 clinical trials. One Phase 1 trial was not completed when the program was previously discontinued. Across all trials, 1,289 adult subjects have participated, including healthy volunteers and patients with various underlying conditions (see summary table below). Of the subjects, 895 have been exposed to at least one dose of gemcabene.

We believe that gemcabene's efficacy across the clinical and non-clinical trials support our development plan focused on HoFH, HeFH, ASCVD, SHTG and NASH patients. In Phase 2 studies, patients treated with gemcabene were observed to have significantly lowered LDL-C, hsCRP and triglycerides with results from the trials summarized below:

- In a four week, double-blind, multiple dose, Phase 1 trial in 50 healthy subjects (Trial 1027-003), gemcabene monotherapy doses (450 mg, 600 mg and 900 mg) significantly lowered LDL-C from baseline by approximately 30%.
- In an eight week, double-blind, placebo-controlled, Phase 2 trial in 66 patients with elevated LDL-C on background stable statin therapy (Trial 1027-018), both gemcabene doses (300 mg and 900 mg) in combination with statins significantly lowered LDL-C from baseline by approximately 25% to 31%. Additionally, gemcabene demonstrated reductions in hsCRP of up to 54%.
- In an eight week, double-blind, placebo-controlled, Phase 2 trial in 277 patients with hypercholesterolemia (Trial A4141001), gemcabene monotherapy doses (300 mg, 600 mg and 900 mg) significantly lowered LDL-C, with the 600 mg and 900 mg doses lowering LDL-C by approximately 30%. Gemcabene monotherapy doses (600 mg and 900 mg) also significantly lowered hsCRP by approximately 40%.
- In a 12-week, double-blind, placebo-controlled, Phase 2 trial (Trial 1027-004), 94 of the 161 patients had elevated triglycerides (≥ 200 mg/dL). For those patients, gemcabene lowered triglycerides in all dose arms, with the 300 mg dose lowering triglycerides by 40%. A post-hoc analysis of nine patients with severe triglyceride levels (≥ 500 mg/dL) treated with 150 mg and 300 mg suggest gemcabene has the potential to lower triglycerides by as much as 60%.

Gemcabene was observed to be well tolerated at single doses up to 1,500 mg and multiple doses up to 900 mg/day. This includes 837 subjects who received multiple doses of up to 900 mg for up to 12 weeks. Safety of the subjects in these trials was evaluated by AE monitoring, clinical laboratory assessments, electrocardiograms (ECGs), physical examinations, and vital sign assessments. Across all trials, 10 healthy volunteers or patients reported a treatment-emergent SAE, none of which were considered by the clinician to be related to gemcabene. No deaths occurred in any of the trials. AEs reported were generally mild to moderate in intensity with the most common events being headache, weakness, nausea, dizziness, upset stomach, infection and abnormal bowel movements. Gemcabene, when compared with placebo, was not associated with an increased incidence of myalgia or liver enzyme elevations, whether as monotherapy or in combination with statin therapy. Elevated levels of liver enzymes, specifically alanine transaminase (ALT) and/or aspartate aminotransferase (AST), were observed in a few patients (0.23% of gemcabene patients compared to 0.26% of placebo patients had ALT or AST levels more than three times the upper limit of normal (ULN)) returning to baseline after cessation of treatment. Small mean increases in serum creatinine and blood urea nitrogen (BUN) have been observed in some trials. The increase was reversible with all creatinine values returning to baseline within approximately two weeks of cessation of gemcabene. No clinically meaningful changes were observed in physical examinations or vital signs, including blood pressure.

In addition, gemcabene demonstrated promising clinical pharmacology attributes across 10 completed Phase 1 trials in healthy subjects, such as once-daily dosing, no meaningful drug-drug interactions with high-intensity statins and no observed food effect. Gemcabene can be taken with or without food. Gemcabene was observed to: (1) be rapidly absorbed following oral administration with time of maximum concentration within two hours and (2) reach maximum plasma concentration (C_{max}) and area under the curve over 24 hours (AUC 0-24) that were dose proportional following both single- and multiple-dose administration. Steady state concentrations were achieved within six days of repeated dose administration. Average half-life ranged from 32 to 41 hours. Gemcabene's primary route of elimination was renal. In addition, no significant drug-drug interactions were observed with digoxin, a cardiovascular drug for the treatment of atrial fibrillation, atorvastatin and simvastatin, both agents used as background therapy in patients with HoFH, HeFH and ASCVD. Patients with SHTG and NASH often have statin therapy prescribed as well. There were no observed clinically

relevant effects on QTc, a measure of cardiac rhythm, and no observed clinically relevant effect on blood pressure. Renal clearance was slightly decreased and was associated with a slight increase in serum creatinine.

Based on the results of these trials, we believe gemcabene has the potential to have a differentiated profile as an oral once-daily, well tolerated adjunct therapy with promising evidence of efficacy in lowering of LDL-C, hsCRP and triglycerides in patients with dyslipidemia and NASH.

Gemcabene Phase 2 Completed Clinical Trials

Gemcabene has been evaluated in seven Phase 2 trials across a diverse patient population. These trials explored safety, tolerability and efficacy and multiple doses of gemcabene as monotherapy and in combination with low-, moderate- and high-intensity statins. The table below summarizes our completed Phase 2 clinical trials.

Summary of Phase 2 Completed Clinical Trials with Gemcabene

<u>Trial Number</u>	<u>Patient / Indication</u>	<u>Trial Objectives</u>	<u>Doses</u>	<u># Patients</u>	<u>Duration</u>	<u>Key Lipid and Other Endpoints</u>
1027-004	Low HDL-C and normal or elevated TG (including SHTG)	Double-blind, placebo-controlled, randomized trial to determine the efficacy and safety of gemcabene in subjects with low HDL-C and either normal or elevated triglycerides	150, 300, 600, 900 mg	GEM=129 placebo=32	12 weeks	HDL-C, TG, LDL-C, hsCRP, apoB, Total cholesterol
1027-012	Hypertension	Double-blind, placebo-controlled, randomized trial to determine the effect of gemcabene compared to quinapril	900 mg (with quinapril 20 mg)	GEM=43 quinapril=18 placebo=41	12 weeks	Systolic BP, Diastolic BP
1027-014	Healthy Obese Non-diabetic	Double-blind, placebo-controlled, randomized trial to determine the effect of gemcabene on insulin sensitivity	900 mg	GEM=26 placebo=27	4 weeks	Insulin sensitivity
1027-015	Hypertension	Double-blind, placebo-controlled, randomized trial to determine the effect of gemcabene on blood pressure	900 mg	GEM=23	4 weeks	Systolic BP, Diastolic BP
1027-018	Hypercholesterolemia (not at goal on stable statin)	Double-blind, placebo-controlled, randomized trial to determine the efficacy and safety of gemcabene on stable statin therapy	300, 900 mg (with various low, moderate and high intensity statins)	GEM=42 placebo=24	8 weeks	LDL-C, hsCRP, apoB, TG, HDL-C, VLDL, Total cholesterol
A4141001	Hypercholesterolemia	Double-blind, placebo-controlled, randomized trial to determine the efficacy and safety of gemcabene as monotherapy or in combination with atorvastatin (after statin washout)	300, 600, 900 mg (with 10, 40, 80 mg atorvastatin)	GEM=208 atorvastatin=52 placebo=17	8 weeks	LDL-C, hsCRP, apoB, TG, HDL-C, Total cholesterol
A4141004	Osteoarthritis	Double blind, placebo controlled, randomized trial to determine the efficacy and safety of gemcabene in patients with osteoarthritis of the knee	150, 450, 900 mg (with rofecoxib 25 mg)	GEM=242 rofecoxib=79 placebo=83	4 weeks	Pain assessment, CGIC, PGIC, SODA

SODA=Sequential occupational dexterity assessment, PGIC=Patients global impression of change, CGIC=Clinical global impression of change, GEM=gemcabene; TG=triglycerides.

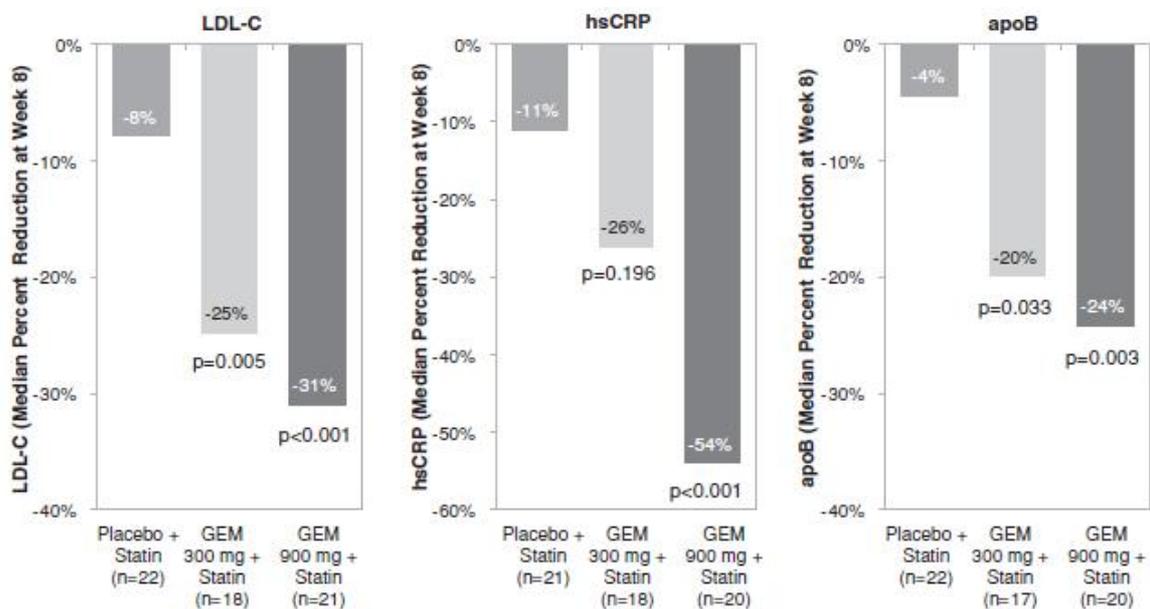
Gemcabene Phase 2 Trial in Patients with Hypercholesterolemia on Stable Statin Therapy (Trial 1027-018)

This Phase 2 double-blind, placebo-controlled, randomized trial in patients with hypercholesterolemia was designed to assess the efficacy and safety of gemcabene when added to stable statin therapy. A majority of the patients were on moderate- to high-intensity statin therapy for at least three months (high \approx 20%, mod \approx 60% and low \approx 20%). Gemcabene was administered at 300 mg and 900 mg once-daily for eight weeks. The primary endpoint was median percent change from baseline in LDL-C. Other endpoints included median percent change from baseline in hsCRP, apoB, total cholesterol, VLDL-C and triglycerides at Week 8. A total of 66 patients were randomized and 61 patients were evaluated for efficacy. Baseline LDL-C levels were similar across the treatment arms at approximately 150 mg/dL.

Efficacy: As presented in the figure below, patients treated with gemcabene were observed to have significantly lowered LDL-C from baseline at 300 mg and 900 mg by 25% ($p=0.005$) and 31% ($p<0.001$), respectively. Patients treated with gemcabene were also observed to have significantly lowered hsCRP, apoB and total cholesterol. At 900 mg, patients treated with gemcabene demonstrated significantly lowered hsCRP by 54% ($p<0.001$). At 300 mg and 900 mg, patients treated with gemcabene demonstrated significantly lowered apoB by 20% ($p=0.033$) and 24% ($p=0.003$), respectively. At 300 mg and 900 mg, patients treated with gemcabene demonstrated significantly lowered total cholesterol by 18% ($p=0.008$) and 22% ($p<0.001$), respectively. It was further observed that all four (4) patients treated with 900 mg gemcabene on high-intensity statins have a mean LDL-C reduction of 24%.

We believe these results support the continued development of gemcabene for the treatment HoFH, HeFH and ASCVD indications on maximally tolerated statins. Classification of statin dose intensity is defined in the 2013 ACC guidelines.

Median Percent Change from Baseline at Week 8 in Patients with Hypercholesterolemia on Background Stable Statin Therapy



LDL-C Median Percent Change from Baseline at Week 8 in Patients with Hypercholesterolemia on Background Stable Statin Therapy

	<u>Placebo + Statin</u>	<u>GEM 300 mg + Statin</u>	<u>GEM 900 mg + Statin</u>
n	22	18	21
Median Baseline LDL-C	153.3	143.5	142.5
Median Week 8 LDL-C	137	101.5	103
Median % Change	-7.9%	-24.8%	-31.0%
p-Value vs. Placebo	N/A	0.005	<0.001

*N/A = not applicable

Safety: Gemcabene was observed to be well tolerated. Patients taking either 300 mg or 900 mg of gemcabene were observed to have a safety profile similar to that of placebo (300 mg: 20%; 900 mg: 23%; placebo: 29%). One patient experienced an SAE in the gemcabene 900 mg treatment arm, which was not considered related to treatment. Three patients (placebo: 2, gemcabene 300 mg: 1) withdrew from the trial due to an AE, all of which were considered possibly related to treatment. AEs reported were generally mild to moderate in intensity. The most frequent AE in the placebo arm was infection (13%). The most frequent AEs in the gemcabene treatment arms were headache (10%) and infection (10%). There were no meaningful changes in liver enzymes ALT and AST. One patient in the 300 mg gemcabene treatment arm had a single laboratory assessment with a rise in creatine kinase of 5 × upper limit of normal (ULN). No clinically meaningful changes in physical examinations or vital signs from baseline to the end of the trial were observed for any patient.

Gemcabene Phase 2 Trial in Patients with Hypercholesterolemia (Trial A4141001)

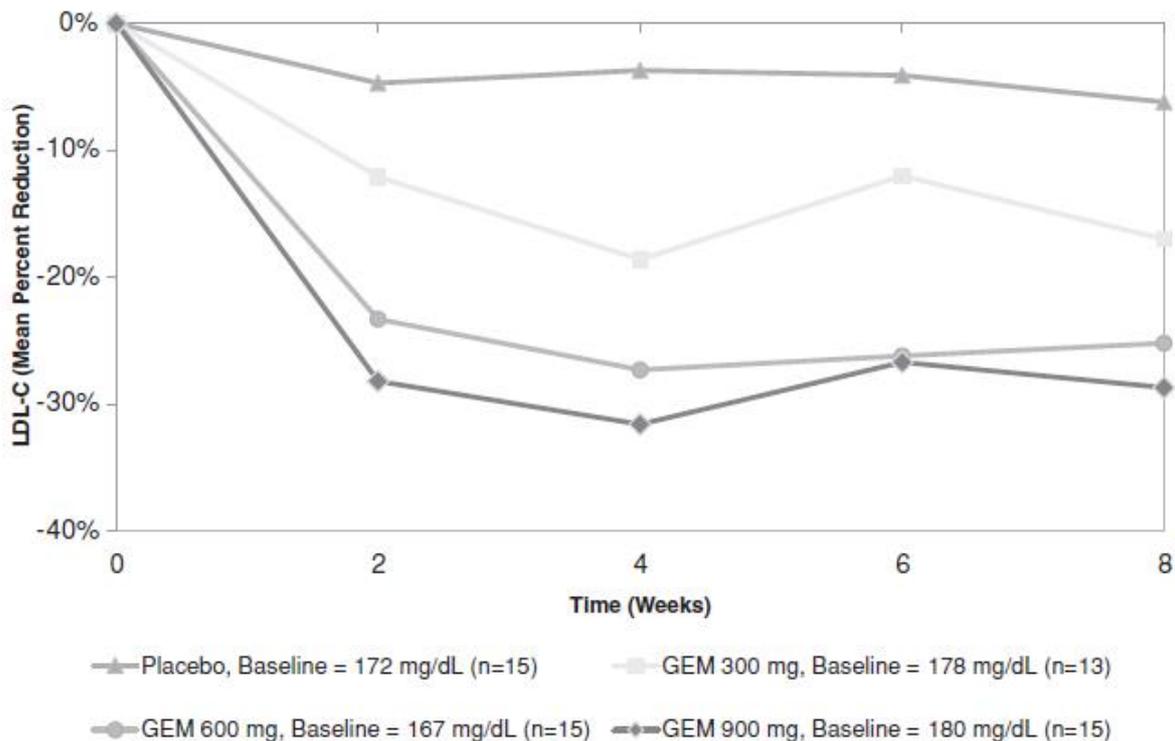
This Phase 2 double-blind, placebo-controlled, randomized trial was designed to assess the efficacy and safety of gemcabene administered as monotherapy, atorvastatin monotherapy or gemcabene initiated simultaneously in combination with atorvastatin in the treatment of patients with hypercholesterolemia. When applicable, patients were washed out of statins and other lipid-lowering therapies. Gemcabene was administered as monotherapy once-daily at 300 mg, 600 mg or 900 mg or in combination with atorvastatin once-daily at 10 mg, 40 mg and 80 mg. The primary endpoint was percent change in LDL-C from baseline at Week 8. Secondary endpoints included percent change in hsCRP, apoB, HDL-C and triglycerides from baseline at Week 8. A total of 277 patients were randomized and 255 patients with at least one post baseline assessment were included in the efficacy analysis. Baseline LDL-C levels for the evaluable patients after washout were similar across treatment arms at approximately 175 mg/dL.

Efficacy: As presented in the figure below, patients treated with gemcabene were observed to have significantly lowered LDL-C by 17% (p=0.0013), 26% (p=0.0001) and 29% (p=0.0001) as monotherapy at 300 mg, 600 mg and 900 mg, respectively. The LDL-C lowering effect was seen within two weeks and was stable for the duration of the eight week trial. It is important to note that the patients included in this trial were statin responsive (able to reach goal near or below 100 mg/dL) at 10 mg, 40 mg and 80 mg atorvastatin monotherapy. While the trial demonstrated gemcabene provided additional dose dependent LDL-C lowering (statistically significant at 600 mg and 900 mg when compared to atorvastatin alone), the gemcabene treatment effect was less pronounced due to the patients already being at or below LDL-C goal of 100 mg/dL on atorvastatin monotherapy. Patients treated with gemcabene were observed to have lowered hsCRP by 26% (p=0.1612), 42% (p=0.0070) and 35% (p=0.0018) as monotherapy at 300 mg, 600 mg and 900 mg, respectively.

Patients treated with gemcabene in combination with atorvastatin aggregated over the dose range were observed to have mean LDL-C lowering of 50% (p=0.0852), 52% (p=0.0045) and 54% (p=0.0006) at 300 mg, 600 mg and 900 mg, respectively. Patients treated with gemcabene in combination with atorvastatin aggregated over the dose range were observed to have median hsCRP lowering of 47% (p=0.0237), 54% (p=0.0017) and 60% (p=0.0001) at 300 mg, 600 mg and 900 mg, respectively.

We believe these results support the continued development of gemcabene for the treatment HoFH, HeFH and ASCVD indications including mixed dyslipidemia.

**LDL-C Mean Percent Change from Baseline in Patients with Hypercholesterolemia
(with wash-out of statins)**



Safety: Gemcabene was observed to be well tolerated. Patients taking any dose of gemcabene (300 mg, 600 mg or 900 mg) were observed to have a safety profile similar to that of atorvastatin monotherapy. A similar percentage of patients experienced an associated AE between placebo (18%), atorvastatin monotherapy arms (14%) compared to gemcabene monotherapy (18%) and gemcabene plus atorvastatin treatment arms (17%). Three patients in the gemcabene plus atorvastatin arm experienced a SAE, none of which were considered related to treatment. 16 patients (placebo: 1, atorvastatin monotherapy: 2, gemcabene monotherapy: 6, gemcabene plus atorvastatin: 7) withdrew from the trial due to AEs, nine (atorvastatin monotherapy: 2, gemcabene monotherapy: 4, gemcabene plus atorvastatin: 3) of which were considered possibly related to treatment. AEs reported were generally mild to moderate in intensity. 14 patients (placebo: 1, atorvastatin monotherapy: 2, gemcabene monotherapy: 1, gemcabene plus atorvastatin: 10) reported an AE considered severe in intensity, one (gemcabene plus atorvastatin: 1) of which was considered possibly related to treatment. The most frequently occurring AEs across all treatment arms were infection (8%), pain (6%) and headache (6%). Small mean increases in serum creatinine and BUN were observed in the gemcabene monotherapy arms. One patient treated with 600 mg gemcabene plus atorvastatin had a clinically significant ALT elevation ($>3 \times$ ULN on two separate occasions) that returned to near normal levels while treatment continued. No other patient had a pre-specified clinically significant lab abnormality in ALT, AST, creatinine kinase or serum creatinine. No clinically meaningful changes in physical examinations or vital signs from baseline to the end of the trial were observed for any patient. The AEs experienced by more than 10% of patients in any treatment group are summarized below.

**Adverse Events by Body System Occurring With $\geq 10\%$ of Patients in
Any Treatment Group for Study A4141001**

AE Category	Pbo N=17	Atorvastatin Mono			Gemcabene 300 mg + Atorvastatin 10				Gemcabene 600 mg + Atorvastatin				Gemcabene 900 mg + Atorvastatin			
		10 mg N=17	40 mg N=18	80 mg N=17	Mono N=16	mg N=17	40 mg N=18	80 mg N=18	Mono N=18	10 mg N=18	40 mg N=16	80 mg N=18	Mono N=17	10 mg N=18	40 mg N=16	80 mg N=18
All Adverse Events																
Body as a whole	5 (29)	4 (24)	5 (28)	4 (24)	5 (31)	3 (18)	5 (28)	4 (22)	7 (39)	7 (39)	4 (25)	4 (22)	4 (24)	5 (28)	8 (50)	10 (56)
Asthenia	0 (0)	0 (0)	1 (6)	2 (11)	0 (0)	0 (0)	0 (0)	0 (0)	1 (6)	2 (11)	0 (0)	1 (6)	1 (6)	0 (0)	1 (6)	0 (0)
Back Pain	0 (0)	0 (0)	1 (6)	0 (0)	0 (0)	0 (0)	1 (6)	1 (6)	1 (6)	2 (11)	0 (0)	2 (11)	0 (0)	0 (0)	1 (6)	0 (0)
Headache	0 (0)	1 (6)	3 (17)	1 (6)	1 (6)	0 (0)	1 (6)	0 (0)	1 (6)	2 (11)	1 (6)	1 (6)	1 (6)	2 (11)	0 (0)	1 (6)
Infection	3 (18)	1 (6)	1 (6)	0 (0)	3 (19)	1 (6)	1 (6)	1 (6)	3 (17)	2 (11)	0 (0)	0 (0)	0 (0)	2 (11)	1 (6)	3 (17)
Pain	0 (0)	2 (12)	1 (6)	0 (0)	0 (0)	1 (6)	3 (17)	1 (6)	2 (11)	1 (6)	1 (6)	0 (0)	0 (0)	1 (6)	1 (6)	2 (11)
Digestion	2 (12)	2 (12)	5 (28)	3 (18)	3 (31)	3 (18)	4 (22)	3 (17)	4 (22)	5 (28)	3 (19)	4 (22)	4 (24)	3 (17)	0 (0)	3 (17)
Constipation	1 (6)	1 (6)	3 (17)	0 (0)	0 (0)	2 (12)	1 (6)	1 (6)	1 (6)	1 (6)	1 (6)	1 (6)	1 (6)	1 (6)	0 (0)	0 (0)
Diarrhea	1 (6)	0 (0)	0 (0)	3 (18)	2 (13)	0 (0)	1 (6)	0 (0)	1 (6)	1 (6)	1 (6)	1 (6)	0 (0)	0 (0)	0 (0)	0 (0)
Dyspepsia	0 (0)	1 (6)	0 (0)	0 (0)	1 (6)	1 (6)	0 (0)	1 (6)	0 (0)	1 (6)	1 (6)	2 (11)	1 (6)	0 (0)	0 (0)	0 (0)
Flatulence	1 (6)	0 (0)	1 (6)	0 (0)	2 (13)	0 (0)	1 (6)	1 (6)	1 (6)	1 (6)	0 (0)	0 (0)	0 (0)	1 (6)	0 (0)	0 (0)
Nausea	0 (0)	0 (0)	1 (6)	1 (6)	2 (13)	0 (0)	2 (11)	2 (11)	0 (0)	1 (6)	1 (6)	0 (0)	3 (18)	1 (6)	0 (0)	2 (11)
Musculoskeletal	1 (6)	2 (12)	3 (17)	2 (12)	0 (0)	0 (0)	2 (11)	2 (11)	0 (0)	3 (17)	3 (19)	0 (0)	0 (0)	3 (17)	0 (0)	0 (0)
Arthralgia	0 (0)	2 (12)	2 (11)	0 (0)	0 (0)	0 (0)	1 (6)	0 (0)	0 (0)	1 (6)	2 (13)	0 (0)	0 (0)	2 (11)	0 (0)	0 (0)
Myalgia	0 (0)	1 (6)	1 (6)	1 (6)	0 (0)	0 (0)	0 (0)	1 (6)	0 (0)	2 (11)	1 (6)	0 (0)	0 (0)	1 (6)	0 (0)	0 (0)

AE = adverse event; Mono = monotherapy; Pbo = placebo.

Source: Report A4141001, Table 40 (Cowmeadow et al., 2003)

Gemcabene Phase 2 Trial in Patients with Elevated Triglycerides (Trial 1027-004)

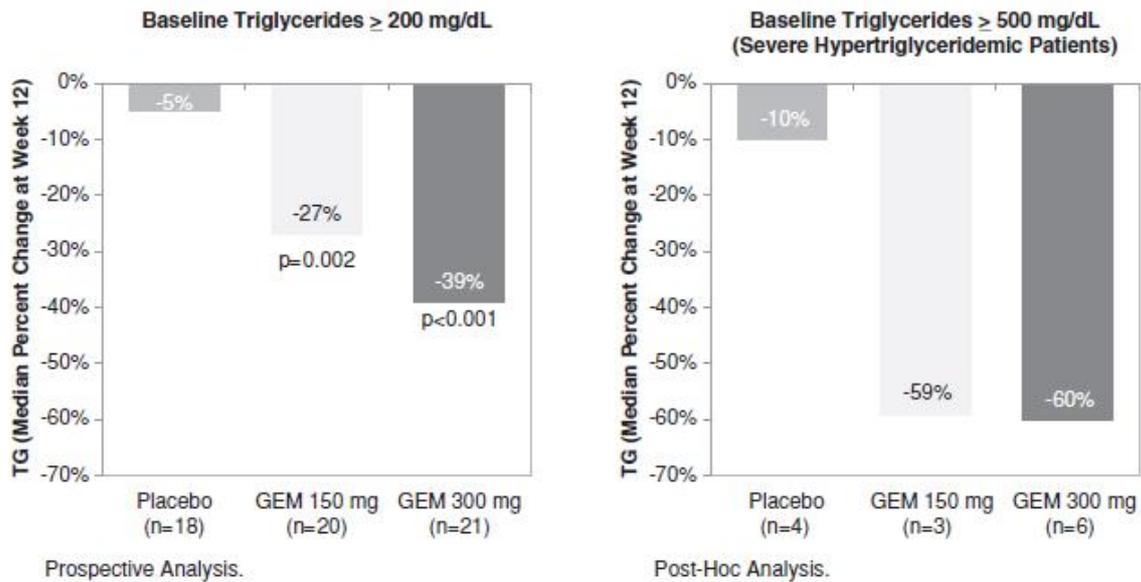
This Phase 2 double-blind, placebo-controlled, randomized trial was designed to assess the efficacy and safety of gemcabene in patients with low HDL-C and either normal or elevated triglycerides. Gemcabene was administered at 150, 300, 600 and 900 mg once-daily for 12 weeks. The objectives of this trial were to evaluate percentage change from baseline in HDL-C, LDL-C, triglycerides and other lipids and apolipoprotein variables at Week 12. A total of 161 patients were randomized. At baseline, 67 patients were normotriglyceridemic (<200 mg/dL) and 94 patients were hypertriglyceridemic (≥ 200 mg/dL). Baseline triglycerides were approximately 370 mg/dL across the treatment arms with hypertriglyceridemia with the exception of the 600 mg treatment arm (580 mg/dL). A total of 155 patients (89 hypertriglyceridemic patients) had a post randomization assessment to be evaluated for efficacy. Baseline LDL-C levels for the evaluable patients, regardless of the triglyceride stratum, were similar across the treatment arms at approximately 110 mg/dL.

Efficacy: As presented in the figure below, patients with triglyceride levels greater than 200 mg/dL (hypertriglyceridemic patients), treated with gemcabene at 150 mg and 300 mg were observed to have lowered triglycerides by 27% (p=0.002) and 39% (p<0.001), respectively compared to baseline. Although patients treated with gemcabene at 600 mg and 900 mg were observed to have lower triglycerides, the lowering effect was not significant when compared to placebo. Therefore, the anticipated dose for treatment of patients with elevated triglyceride levels is 150 mg or 300 mg. Notably, patients treated with gemcabene were observed to have significantly lowered LDL-C by 19% (p<0.001) and 20% (p<0.001) at 600 mg and 900 mg, respectively, compared to baseline.

A post-hoc analysis of the nine patients with severe triglyceride levels (≥ 500 mg/dL; baseline means of two weeks prior and time zero was approximately 600 mg/dL) treated with 150 mg and 300 mg suggest gemcabene has the potential to lower triglycerides by as much as 60%.

We believe these results support the continued development of gemcabene for the treatment SHTG and ASCVD patients with mixed dyslipidemia.

Triglyceride Median Percent Change from Baseline at Week 12 in Patients with High to Severe Hypertriglyceridemia



Safety: Gemcabene was observed to be well tolerated. Patients taking any dose of gemcabene (150 mg, 300 mg, 600 mg or 900 mg) were observed to have a safety profile similar to that of placebo. Fewer patients experienced an associated AE in the placebo arm (9%) compared to gemcabene treatment arms (17%). Three patients (placebo: 1, gemcabene: 2) experienced SAEs, none of which were considered related to treatment. Six patients (placebo: 2, gemcabene: 4) withdrew from the trial due to AEs, four (placebo: 1, gemcabene: 3) of which were considered possibly related to treatment. AEs reported were generally mild to moderate in intensity. Two patients (placebo: 1, gemcabene: 1) reported an AE considered severe in intensity. The most frequent AEs in the placebo arm were infection (16%), accidental injury (6%), back pain (6%), dyspepsia (6%), headache (6%) and sinusitis (6%). The most frequently observed AEs in the gemcabene arms were infection (12%), headache (7%) and asthenia (5%). Two patients had ALT values that met the definition of a clinically important laboratory abnormality (placebo: 1, 600 mg gemcabene: 1). One patient had elevated BUN values considered clinically significant (600 mg gemcabene: 1). All of these laboratory abnormalities were considered mild to moderate. No clinically meaningful changes in physical examinations or vital signs from baseline to the end of the trial were observed for any patient.

Gemcabene Phase 1 Clinical Trials

Gemcabene has been evaluated in ten completed Phase 1 trials in healthy volunteers. These trials explored safety, tolerability, pharmacokinetics, pharmacodynamics and dose response as monotherapy and in combination with high-intensity statin doses and other drugs. The table below summarizes our completed Phase 1 trials. Select trials are described in more detail below.

Summary of Phase 1 Clinical Trials of Gemcabene in Healthy Volunteers

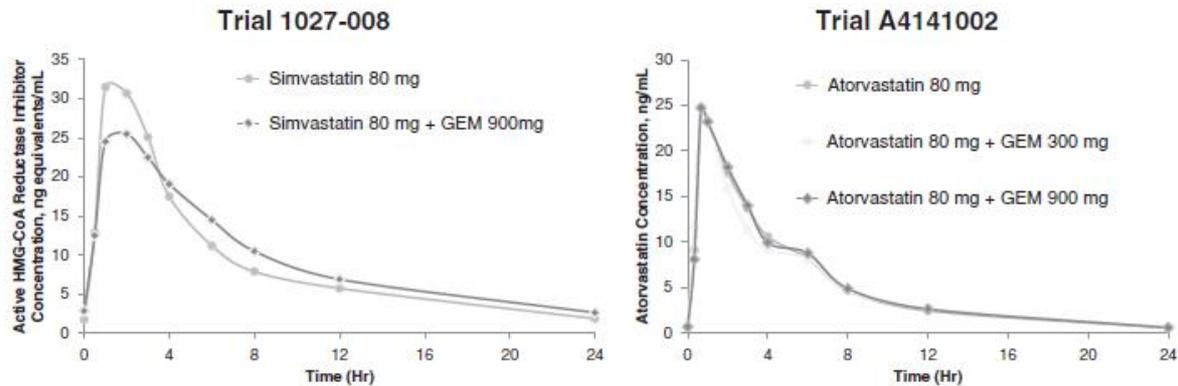
<u>Trial Number</u>	<u>Trial Objectives</u>	<u>Doses</u>	<u># Volunteers</u>	<u>Duration</u>
1027-001	Single-dose trial to evaluate safety, tolerability and pharmacokinetics (PK) of gemcabene	25, 100, 300, 600, 1,050, 1,500 mg	GEM = 12	Single Dose
1027-002	Single-dose trial to evaluate the effect of food on the PK of gemcabene	450 mg	GEM = 12	Single Dose
1027-003	Double blind, placebo controlled, randomized trial to evaluate the PK and pharmacodynamics (PD) at multiple doses of gemcabene	50, 150, 450, 750/600, 900 mg	GEM = 40 placebo = 10	4 Weeks
1027-008	Trial to determine the potential drug-drug interactions of simvastatin with gemcabene	900 mg (with 80 mg simvastatin)	GEM = 20	15 Days
1027-009	Trial to evaluate the bioequivalence between a capsule and tablet formulation of gemcabene	300 mg	GEM = 16	Single Dose
1027-010	Trial to evaluate the mass balance and metabolism of gemcabene	600 mg	GEM = 6	Single Dose
1027-011	Trial to determine the potential drug-drug interactions of digoxin with gemcabene	900 mg (with 0.25 mg digoxin)	GEM = 12	10 Days
A4141002	Trial to determine the potential drug-drug interactions of atorvastatin with gemcabene	300, 900 mg (with 80 mg atorvastatin)	GEM = 20	22 Days
A4141003	Trial to evaluate the effect of gemcabene on QT interval	900 mg	GEM = 20	8 Days
A4141005	Trial to evaluate the effect of gemcabene on the glomerular filtration rate	900 mg (with 3,235 mg lohexol)	GEM = 12	10 Days

Note: One trial (A4141006; 23 volunteers) was stopped prior to completion as a result of discontinuation of the program. The trial was designed to evaluate multiple fixed-dose combinations of gemcabene with atorvastatin.

Gemcabene Phase 1 Drug-Drug Interaction Trials to Assess PK on Statins (Trials 1027-008 and A4141002)

Two open-label, multiple-dose, Phase 1 trials were conducted to assess PK of gemcabene in combination with high-intensity statins. In Trial 1027-008, 900 mg of gemcabene was co-administered with 80 mg simvastatin in 20 healthy volunteers. In Trial A4141002, 300 mg and 900 mg of gemcabene were co-administered with 80 mg atorvastatin in 20 healthy volunteers. In both trials, treatment with gemcabene in combination with statins was observed to be well tolerated by volunteers. Furthermore, as presented in the figures below, the PK profiles with and without 900 mg gemcabene were observed to be similar, suggesting no clinically relevant drug-drug interactions with either 80 mg simvastatin or 80 mg atorvastatin.

PK Profiles of High-Intensity Statins Co-administered with Gemcabene



Gemcabene Preclinical Studies

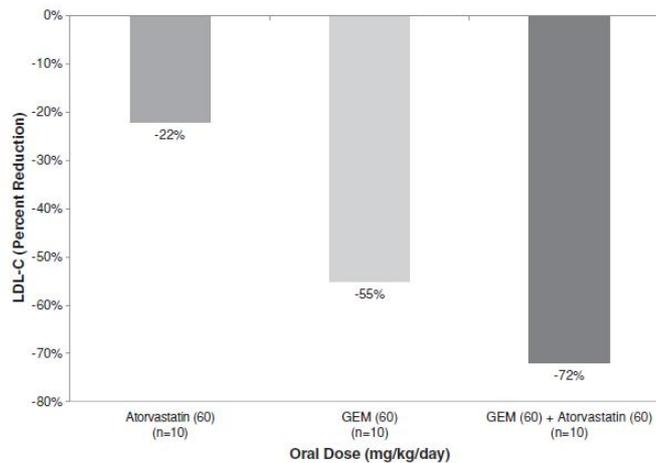
As part of a comprehensive nonclinical toxicology program, over 30 exploratory and definitive single and repeated-dose toxicity studies with gemcabene were conducted in mice, rats, dogs and monkeys. There are very few outstanding nonclinical studies needed for registration such as two-year carcinogenicity studies in rodents and juvenile toxicology. Gemcabene was well tolerated in these completed studies, including a 26-week repeat dose study in rats and monkeys and 52-week repeat dose study in monkeys. The completed studies support conducting clinical trials up to six months.

In multiple preclinical efficacy studies, gemcabene was observed to have lowering effects on plasma LDL-C, triglycerides and anti-inflammatory markers in diet-induced and genetic preclinical models of dyslipidemia.

In Vivo Proof of Principle Study for HoFH

In LDL-receptor deficient mice, gemcabene at 60 mg/kg/day was observed to reduce LDL-C up to 55% as monotherapy and 72% in combination with statins. This dose in mice is equivalent to approximately a 450 mg gemcabene tablet per day in humans. This LDL-receptor deficient animal model has been reported in literature to be fairly predictive of HoFH therapies in practice. For example, statin lowering of approximately 20% in LDL-receptor deficient-mice model correlates well to the approximately 15% to 20% LDL-C lowering observed in HoFH patients, and Juxtapid lowering of approximately 50% to 80% in LDL-receptor deficient-rabbits model correlates well to the approximately 40% to 50% in HoFH patients.

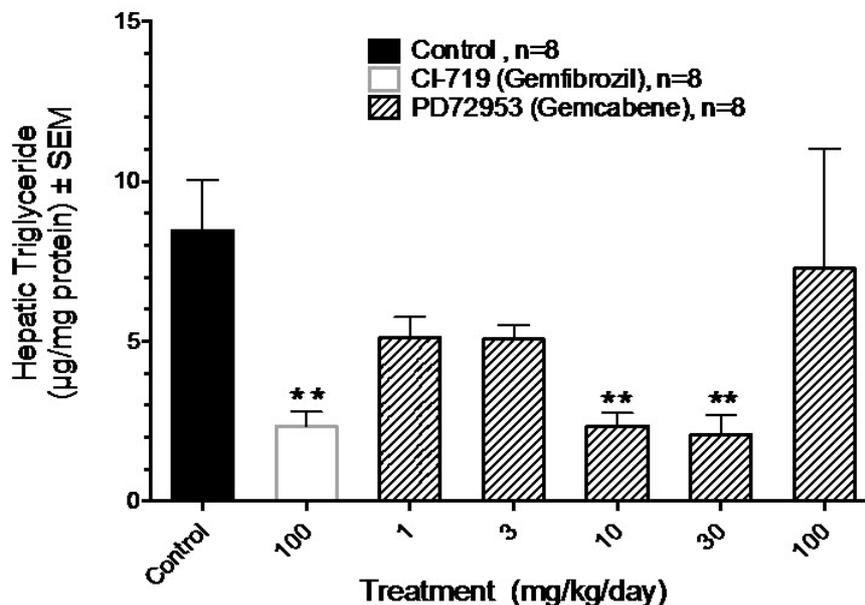
Gemcabene Preclinical HoFH Mice Model



In Vivo Proof of Principle for Hepatic Triglyceride Reduction

Gemcabene was studied in a chow-fed Sprague-Dawley rat model to explore the effects on fat content in the liver. The results of gemcabene 10 and 30 mg/kg/day doses in this rat model were similar to gemfibrozil. Gemcabene treatment significantly reduced hepatic triglycerides by 74% in chow-fed Sprague-Dawley rats.

Hepatic Lipids in Male Sprague-Dawley Rats Treated with Gemfibrozil or Gemcabene

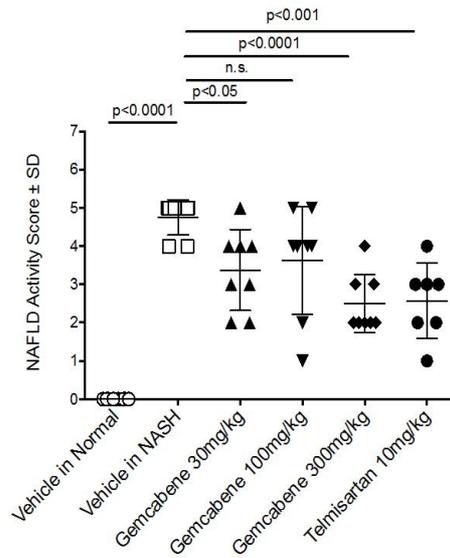


In Vivo Proof of Concept for NASH (STAM Murine Model of NASH and Hepatocellular Carcinoma)

NASH was induced in 40 male mice by a single subcutaneous injection of 200 µg streptozotocin solution 2 days after birth and feeding with a high fat diet. Histological analyses of the liver were the key endpoints for the determination of an effect of gemcabene in this preclinical model of NASH. NASH is defined by the presence and pattern of specific histological abnormalities on liver biopsy. The NAFLD Activity Score (NAS) is a composite score that was developed as a tool to measure changes in NAFLD during therapeutic trials. NAS is a composite score comprised of three components that includes scores for steatosis, lobular inflammation and hepatocyte ballooning. NAS was defined as the unweighted sum of the scores for steatosis, lobular inflammation and hepatocyte ballooning. Steatosis grade is quantified as the percentage of hepatocytes that contain fat droplets. The fibrosis stage of the liver is evaluated separately from NAS by histological evaluation of the intensity of sirius red staining of collagen in the pericentral region of liver lobules. NAS scores of 0-2 are not considered diagnostic for NASH, NAS scores of 3-4 are considered either not diagnostic, borderline or positive for NASH, while NAS scores of 5-8 are largely considered diagnostic for NASH. A treatment effect for NASH is based on differences in both NAS and fibrosis levels.

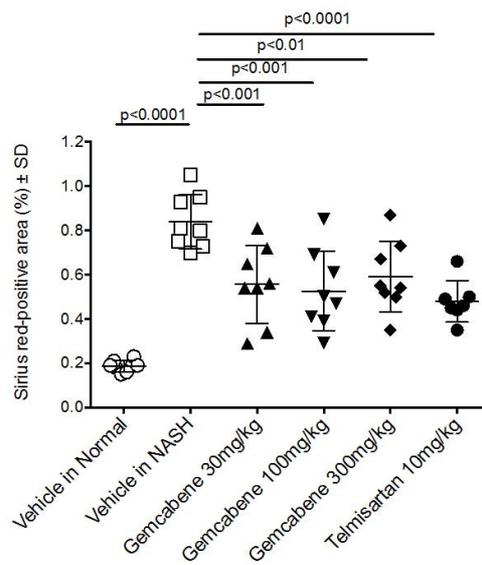
The gemcabene 30 and 300 mg/kg groups and telmisartan group (included as a positive control) showed significant reduction in NAS compared with the Vehicle in NASH group. Since gemcabene reduced steatosis and ballooning scores, the data suggested that gemcabene improved NASH pathology by inhibiting hepatocyte damage and ballooning cell formation.

STAM Model NAFLD Activity Score (NAS)



Sirius red-stained liver sections were evaluated to determine liver fibrosis. Liver sections from the Vehicle in NASH group showed increased collagen deposition in the pericentral region of liver lobule compared with the Vehicle in Normal group. All gemcabene groups showed significant decreases in fibrosis area compared with the Vehicle in NASH group.

STAM Model Fibrosis (Sirius Red-Positive Area)



Additionally, hepatic gene expression and plasma markers indicative of inflammation (e.g., CRP and CCR2/CCR5), and lipid modulation (e.g., ApoC-III and ACC1) were significantly reduced as were other markers. Gemcabene demonstrated proof of concept on NAS score and fibrosis, supporting further development in the clinic.

Gemcabene Clinical Development Plan

In June and September 2015, Gemphire received FDA feedback from its Type C meetings related to the development of gemcabene for the treatment of patients with HoFH. The FDA indicated that historically LDL-C has been accepted as a surrogate endpoint for cardiovascular risk reduction for lipid-altering drugs to support traditional approval, including patients with HoFH. The FDA reiterated weighing the magnitude of LDL-C reduction in light of the drug's safety profile (e.g., benefit/risk) when using a surrogate endpoint such as LDL-C. Our investigational new drug application (IND) was submitted to the FDA in December 2015 and is in effect. We have also received approvals to initiate studies in the dyslipidemic indications in Canada and Israel.

We have initiated three late stage clinical trials in 2016, and plan to initiate a late stage trial in NASH in 2017. Upon completion of one or more of these clinical trials, we intend to request one or more EOP2 meetings with the FDA and other foreign regulatory authorities to discuss the design and scope of the Phase 3 registration trials and long-term safety exposure needed for registration. We would expect to launch multiple Phase 3 registration trials no later than 2018 for our targeted indications. The development programs for our targeted indications are described below. The in-vitro drug transport studies have been completed in accordance with FDA guidelines, and we expect to conduct a few additional clinical pharmacology Phase 1 trials to support registration.

HoFH: COBALT Program

The clinical development program HoFH patients is expected to include one Phase 2 (GEM-201, COBALT-1) and one Phase 3 (GEM-202, COBALT-2) registration trial.

COBALT-1 is an open-label, dose-escalation study in subjects with HoFH. Up to 8 subjects with genetically diagnosed or meeting clinical criteria are given once daily gemcabene and sequentially titrated every four weeks. Gemcabene doses are 300 mg, 600 mg and 900 mg. Patients are on a background of maximized tolerated stable statin therapy, with or without ezetimibe and with or with evolocumab. The primary endpoint will be LDL-C lowering from baseline at 4, 8, and 12 weeks, the acceptable surrogate endpoint for approval. Other endpoints will include hsCRP, apoB, non-HDL-C, triglycerides, VLDL and total cholesterol. Safety of these patients will be assessed by AE monitoring, clinical laboratory assessments, ECGs, physical examinations and vital sign assessments. An interim analysis on the first two genetically diagnosed HoFH patients was performed in January 2017. The mean percent reduction in LDL-C for these two subjects was 28%. As of March 2017, six patients have been enrolled in COBALT-1 with two additional patients being evaluated for enrollment for a total of 6 to 8 patients, which we believe will be sufficient to support advancement into Phase 3. Top-line results at the 600 mg target commercial dose are expected by end of June 2017.

The Phase 3 registration trial (COBALT-2) is estimated to enroll 30 to 60 patients, and will be conducted globally with the potential for patients to continue in an open-label safety extension. It is anticipated that a single Phase 3 registration trial is expected to be sufficient to support registration.

Hypercholesterolemia HeFH/ASCVD: ROYAL Program

The clinical development program for adult patients with hypercholesterolemia (including but not limited to HeFH and ASCVD) with elevated LDL-C levels while on maximally tolerated high-intensity statin therapy is expected to include one Phase 2 trial (GEM-301, ROYAL-1) followed by Phase 3 registration trials. Current precedent for this high-risk population of patients is that reductions in LDL-C is an acceptable surrogate for registration.

ROYAL-1 is a 12 week, multicenter, double-blind, placebo-controlled, randomized trial in patients with HeFH and/or ASCVD on stable moderate or high intensity statin therapy with or without ezetimibe. The study will include 104 subjects in two arms, gemcabene 600 mg or placebo. The primary endpoint will be LDL-C lowering from baseline at 12 weeks. Other endpoints will include hsCRP, apoB, non HDL-C, triglycerides, VLDL and total cholesterol. Safety of these patients will be assessed by AE monitoring, clinical laboratory assessments, ECGs, physical examinations and vital sign assessments. Enrollment initiated in November 2016 and completed in February 2017 with 105 patients, earlier than originally expected, and we expect top-line results will now be available in the third quarter of 2017.

After our Phase 2 trial and after EOP2 discussions with the FDA meeting and other regulatory agencies, we believe we will be able to better define the Phase 3 registration trials and long-term safety exposure needed for registration.

SHTG: INDIGO Program

The clinical development program for adult patients with SHTG with elevated triglyceride levels is expected to include one Phase 2 trial (GEM-401, INDIGO-1) designed to meet anticipated registration standards, followed by a single Phase 3 registration trial.

INDIGO-1 is a 12 week, multicenter, double-blind, placebo-controlled, randomized trial in patients with severe hypertriglyceridemia (SHTG) ($TG \geq 500$ mg/dL) with or without statin therapy. The study will enroll 90 subjects into one of three arms, gemcabene 300 mg, gemcabene 600 mg and placebo. The primary endpoint will be TG lowering from baseline after 12 weeks. Other endpoints will include LDL-C, hsCRP, apoB, non HDL-C, VLDL and total cholesterol. Safety of these patients will be assessed by AE monitoring, clinical laboratory assessments, ECGs, physical examinations and vital sign assessments. We announced that pre-screening activities initiated in December 2016 and top-line results are expected in the fourth quarter of 2017.

After completion of the Phase 2 trial and after EOP2 discussions with the FDA and other regulatory agencies, we believe we will be able to better define the Phase 3 registration trials and long-term safety exposure needed for registration.

NASH: AZURE Program

We plan to submit an IND to initiate a Phase 2 clinical program in NASH patients. The trial design will be finalized after review with regulatory authorities.

AZURE-1 (GEM-501) is expected to be a 16 week, multicenter, double-blind, placebo-controlled, randomized study in patients with NASH. Adult patients with MRI-PDFF detected hepatic steatosis (liver fat content) $>10\%$ and either biopsy proven NASH with no more than moderate fibrosis, or a magnetic resonance elastography threshold suggestive of NASH with moderate fibrosis will be eligible for enrollment. We expect to enroll 81 subjects in the Phase 2 trial with 27 subjects randomized to one of three arms: gemcabene 300 mg, gemcabene 600 mg, or placebo. The primary endpoint will be the change in fat content from baseline as detected by MRI-PDFF. We expect to initiate this POC study in the second half of 2017, and we anticipate top-line results in the second half of 2018.

After completion of the Phase 2 trial and after EOP2 discussions with the FDA and other regulatory agencies, we believe we will be able to better define the Phase 3 registration trials and long term safety exposure needed for registration.

Additional Studies and Trials

Studies in Response to Partial Clinical Hold for Compounds in PPAR Class

Peroxisome proliferation-activated receptor (PPAR) agonists are drugs which bind and turn on the many PPARs in the nucleus. PPARs comprises three subtypes, PPAR α , PPAR γ and PPAR β (also referred to as PPAR δ). When the PPARs are activated by natural or pharmaceutical molecules those molecules can regulate (turn-off or turn-on) the transcription (making the messenger RNA) of genes that regulate the storage and mobilization of lipids (fats), glucose metabolism, and inflammatory responses. PPAR- α and PPAR γ are the molecular targets of a number of marketed drugs to treat metabolic syndrome including lowering triglycerides and cholesterol such as fibrate drugs and to treat diabetes mellitus and insulin resistance such as thiazolidinedione drugs.

Beginning in 2004, the FDA began issuing partial clinical holds to all sponsors of PPARs or agents deemed to have PPAR-like properties from preclinical studies. The FDA takes the position that preclinical data suggest PPAR agonists are carcinogenic in rodents. In 2004, the FDA determined that gemcabene was a PPAR agonist and issued a partial clinical hold. Our current IND is subject to the same partial clinical hold. The partial clinical hold permits clinical trials of up to six months for gemcabene and also requires us to conduct two-year rat and mouse carcinogenicity studies before conducting clinical trials of longer than six months. Our two-year rat and mouse carcinogenicity studies are underway and scheduled for completion by the end of 2017 and draft reports will be issued shortly thereafter.

We believe the apparent weak PPAR α effects observed in rodents (for example, peroxisome proliferation and elevation of liver weight) are likely rodent-specific phenomena, and, based on scientific publications reviewing nonclinical and clinical experience, share little apparent relevance for human risk assessment. In a recently completed PPAR agonist receptor binding assays we observed essentially no gemcabene binding to the mouse, rat, or human PPAR α , PPAR β , or PPAR γ receptors, whereas reference agents for each of the receptors showed the expected binding, including the

marketed PPAR α agents, such as fibrates, including gemfibrozil. We believe the PPAR α responses in the rat are secondary and perhaps related to the mobilization or formation of a naturally occurring molecule that binds to PPAR α in response to gemcabene administration.

Cardiovascular Outcomes Trials

We believe it is well accepted that every 1.6 mg/dL lowering of LDL-C through the cholesterol synthesis pathway results in a 1% lowering of cardiovascular disease risk. The FDA has not required any approved therapy targeting LDL-C lowering, including non-statin therapies, to initiate or complete a cardiovascular outcomes trial in connection with its approval of HoFH, HeFH and ASCVD therapies. Based on recent drug approvals, we believe it is unlikely that the FDA will require us to initiate or complete a cardiovascular outcomes trial for any of the targeted indications, although we would plan to initiate a cardiovascular outcomes trial, for illustration in high-risk ASCVD patients with mixed dyslipidemia, prior to NDA filing to pursue broader label indications related to cardiovascular disease risk reduction. Notwithstanding our current expectations, the FDA could require us to initiate or complete a cardiovascular outcomes trial as a condition to filing or approving an NDA for gemcabene.

Future In-licensing and Acquisition Opportunities

Our scientific team is well-qualified to identify, in-license or acquire, and develop additional product candidates to diversify our pipeline and generate long-term growth. We continually evaluate and prioritize interesting product candidates based on scientific merit, regulatory pathways, and commercial differentiation. Our focus is on cardiometabolic product candidates.

Sales and Marketing

Given our current stage of development, we have not yet established a commercial organization or distribution capabilities, nor have we entered into any partnership or co-promotion arrangements with an established pharmaceutical company. To develop the appropriate commercial infrastructure to launch gemcabene in the United States, if approved, for the narrower indications of HoFH, we may build out a specialty sales force to reach a concentrated number of approximately 50 lipid centers and 500 lipidologists across the country. This would require additional financial and managerial resources. We may co-promote the SHTG indication with a partner or use a contract sales force along with our internal sales force and distributor(s). We may engage in partnering discussions with third parties from time to time. As we further develop and seek approval as well as launch commercial sales of gemcabene outside of the United States or for broader patient populations in the United States, including patients with HeFH, ASCVD and NASH, we may establish partnerships with one or more pharmaceutical company collaborators, depending on, among other things, the applicable indications, the related costs and our available resources.

Chemistry, Manufacturing and Controls (CMC)

Gemcabene is a small molecule drug candidate that can be synthesized as a single polymorph crystalline monocalcium salt, using readily available raw materials and based on conventional chemical processes.

We do not own or operate, and currently have no plans to establish, any manufacturing facilities. We rely on contract manufacturers to produce both the drug substance and drug product amounts required for our preclinical studies and clinical trials under current good manufacturing practices (cGMP), a quality system regulating CMC activities.

Since 2015 to date, research and development performed for both drug substance and drug product resulted in a manufacturing process utilized for the production of clinical supply for on-going clinical trials. More specifically, drug substance and drug product process and analytical development have been completed in compliance with the FDA guidelines for Phase 2 clinical trials, and on-going activities are directed to process and method validations for compliance with Phase 3 clinical trials. In addition, our drug product manufacturer has sufficient analytical and process development data to support the manufacture of tablets of various strengths. On-going stability studies for both the drug substance and drug product currently support more than two years of shelf life, sufficient for this stage of development. CMC activities are also oriented towards the initiation of the production of the registration stability lots and validations to support NDA filing and regulatory approvals necessary for the commercial stage.

Our contract manufacturers are currently producing, and will produce in the future, our bulk drug substance and drug product for use in our preclinical studies and clinical trials on a purchase order basis, and do not have any long term arrangements. We intend to identify and qualify our current manufacturers as well as alternative manufacturers to provide bulk drug substance and drug product prior to the NDA submission to the FDA to ensure the regulatory support necessary for multiple manufacturing sites in order to supply sufficient commercial quantities at the drug launch and forward. We plan to continue to rely upon contract manufacturers and, potentially, collaboration partners to manufacture commercial quantities of our drug substances and drug product candidates, if approved for marketing by the applicable regulatory authorities.

Pfizer License Agreement

In April 2011, we entered into a license agreement with Pfizer (the Pfizer Agreement) for a worldwide exclusive license to certain patent rights to make, use, sell, offer for sale and import the clinical product candidate gemcabene. In exchange for this license, we agreed to issue shares of our common stock to Pfizer representing 15% of our fully diluted capital at the close of the first arms-length series A financing, which occurred on March 31, 2015.

We agreed to make milestone payments totaling up to \$37 million upon the achievement of certain milestones, including the first regulatory submission in any country, regulatory approval in each of the United States, Europe and Japan, the first anniversary of the first regulatory approval in any country, and upon achieving certain aggregate sales levels of gemcabene or any product containing gemcabene. Future milestone payments under the Pfizer Agreement, if any, are not expected to begin for at least several years and extend over a number of subsequent years.

We have also agreed to pay Pfizer tiered royalties on a country-by-country basis based upon the annual amount of net sales as specified in the Pfizer Agreement until expiration of the last valid claim of the licensed patent rights, including any patent term extensions or supplemental protection certificates. The royalty rates range from the high single digits to the low teens depending on the level of net sales. Under the Pfizer Agreement we are obligated to use commercially reasonable efforts to develop and commercialize gemcabene.

The Pfizer Agreement will expire upon expiration of the last royalty term. Either party may terminate the Pfizer Agreement for the other party's uncured material breach and specified bankruptcy events. Pfizer may terminate the Pfizer Agreement if we or any of our sublicensees challenge the validity, enforceability or ownership of the licensed patents. Additionally, Pfizer may revoke the license if we are unable to adequately commercialize gemcabene by April 2021.

Intellectual Property

Our patent estate includes patents and/or patent applications to forms of gemcabene, methods of using gemcabene, and methods of manufacturing gemcabene. The patent estate includes patents licensed from Pfizer and additional patents and

applications that have been filed subsequent to obtaining the license that are entirely owned by Gemphire. Charles Bisgaier, a co-founder of Gemphire, is an inventor on nine of the pending eleven patent families. As of February 20, 2017, Gemphire's patent estate, including patents we own or license from third parties, on a worldwide basis, included four issued U.S. patents, eight pending U.S. patent applications, 45 issued patents in foreign jurisdictions including Canada, France, Germany, Great Britain, Ireland, Italy, Mexico and Spain and 16 pending patent applications in foreign jurisdictions including Australia, Canada, China, Europe, Hong Kong, Japan and Mexico. Of our worldwide patents and pending applications, all relate to our product candidate gemcabene.

U.S. Patent number 6,861,555, which was in-licensed from Pfizer, includes claims directed to the calcium salt crystal form of gemcabene that is used in our clinical formulations and will constitute the commercial product as well as other crystalline forms of gemcabene. This patent is expected to expire in 2021; however, we may select this patent for patent term extension from the U.S. Patent and Trademark Office (USPTO) if such an extension is available. Given the expected length of the regulatory review, the expiry date of this patent may be extended to 2023, or possibly 2024. Assuming market approval of gemcabene in 2019, data exclusivity would provide exclusivity for gemcabene out to about 2024. Furthermore, and importantly in our case, the FDA orphan designation for HoFH may provide us seven years of market exclusivity for gemcabene in the United States for HoFH. This market exclusivity would provide protection for gemcabene for treating HoFH out to about 2026. Related foreign patents, which have issued in jurisdictions including Canada, Denmark, Finland, France, Germany, Great Britain, Ireland, Italy, the Netherlands, Sweden, Spain, Japan, Mexico and New Zealand, are expected to expire in 2021, absent any adjustments or extensions.

U.S. Patent Number 8,557,835, which was also in-licensed from Pfizer, includes claims directed to pharmaceutical compositions comprised of combinations of gemcabene with statins and methods of using a combination of gemcabene and a statin for treating several conditions including hyperlipidemia. This patent is expected to expire in 2021, absent any extension. Related foreign patents, which have issued in jurisdictions including France, Germany, Great Britain, Ireland, Italy, Spain, Mexico, and Singapore are expected to expire in 2018, absent any adjustments or extensions.

U.S. Patent No. 8,846,761, which is owned by Gemphire, includes claims directed to methods of reducing risk of pancreatitis for patients with TG \geq 500 mg/dL with gemcabene treatment. This patent is expected to expire in 2032, absent any extension. Foreign patents have issued in Australia, Mexico and Europe. The European patent was validated into 21 European countries. Foreign counterpart patent applications are pending in Australia, Canada, China, Europe, Hong Kong, Mexico and Japan, and any patents issuing from such applications are expected to expire in 2031, absent any adjustments or extensions.

U.S. patent application number 14/370,722, which we own, is directed to methods of decreasing a patient's risk for developing coronary heart disease or preventing, delaying or reducing the severity of a secondary cardiovascular event by administering gemcabene with a statin. Related patent applications are pending in foreign jurisdictions including Australia, Canada, China, Europe, Japan and Mexico. Any patent that may issue in this family, absent any patent term adjustment or extension, is expected to expire in 2033.

In 2015-2017, we filed, two non-provisional patent applications on methods of large scale manufacturing for making dicarboxyalkyl ethers (US Application Number 14/942,765 and corresponding PCT application Number PCT/US2015/060917), any patent issuing from this patent family is expected to expire in 2035. In addition, we filed U.S. provisional patent applications of which 62/300,393, 62/314,597, 62/411,997 and 62/412,017, are pending, and two PCT applications one for methods of treating mixed dyslipidemia using gemcabene in combination with statins and treatment of NASH using gemcabene as a monotherapy (PCT/US2016/060837), and the other relating to fixed dose combinations and modified release formulations of gemcabene and statins (PCT/US2016/060849). Two U.S. Patent Applications were filed as continuations of PCT/US2016/060837. U.S. Patent Application Number 15/416,911, is directed to methods of treating NASH by administering gemcabene as a monotherapy and U.S. Patent Application Number 15/424,620, is directed methods for treating Mixed Dyslipidemia by administering gemcabene and a statin. Any patent that may issue in either of these two families, absent any patent term adjustment or extension, is expected to expire in 2037.

As background, the patent term is typically 20 years from the date of filing a non-provisional application. In the United States, a patent's term may be lengthened several ways. First, patent term adjustment (PTA) compensates a patentee for administrative delays by the USPTO in granting a patent. Second, in certain instances, a patent term extension (PTE) can be granted to recapture a portion of the term effectively lost as a result of the FDA regulatory review period, as provided under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Act. This

restoration period cannot be longer than five years for approval of a drug compound, and the total patent term, including the restoration period, must not exceed 14 years following FDA approval. Only one patent applicable to an approved drug is eligible for the PTE and the application for the extension must be submitted prior to the expiration of the patent and within 60 days from market approval. Independent of patent protection, in the United States, the Hatch-Waxman Act provides a five-year period of non-patent data exclusivity within the United States to the first applicant to gain approval of an NDA for a new chemical entity (NCE). Under this provision, gemcabene may be eligible for up to five years of data and market exclusivity under the Hatch-Waxman Act, because it is considered a NCE because the FDA has not previously approved any other drug containing the active ingredient of gemcabene. In Europe, under the Data Exclusivity Directive, pharmaceutical companies may receive up to 11 years to market their product without risk of competition. In Japan, under the Pharmaceuticals Act of Japan, the market authorization holder, based on the length of a required study period reexamination, may have up to 10 years before a generic can enter the market.

Competition

Our industry is highly competitive and subject to rapid and significant innovation and change. The market for lipid regulating therapies is especially large and competitive. Our potential competitors include large pharmaceutical and biopharmaceutical companies, specialty pharmaceutical and generic drug companies, academic institutions, government agencies and research institutions. Gemcabene, if approved, will face intense competition. Key competitive factors affecting its commercial success will include efficacy, safety, tolerability, reliability, convenience of dosing, price and reimbursement. Although there are currently no approved therapies for NASH, the market for NASH is continuing to evolve with many drug candidates in late stage development.

Statins are the most commonly used therapy to lower LDL-C in the dyslipidemia market. They are used by patients with HoFH as well as HeFH and ASCVD. Branded statins include AstraZeneca's Crestor (rosuvastatin), Merck's Zocor (simvastatin) and Pfizer's Lipitor (atorvastatin) among others. Generic statins are marketed by several companies including Apotex Inc., Mylan N.V. (Mylan), Dr. Reddy's Laboratories Ltd. and Lupin Pharmaceuticals, Inc. (Lupin) among others.

Non-statin based therapies are also used to lower LDL-C in dyslipidemia patients. Merck's Zetia (ezetimibe) is a common non-statin therapy that is often combined with statins for HoFH, HeFH and ASCVD patients. Merck's Vytorin and Liptruzet are fixed-dose combination therapies that combine ezetimibe with statins. Non-statin therapies are combined with statins to improve LDL-C lowering or to offer other efficacy benefits, including Daiichi Sankyo Inc.'s (Daiichi Sankyo) Welchol, a bile acid sequestrant and niacin. Non-statin therapies are also used to treat HoFH. These therapies include Aegerion's Juxtapid, a once-daily oral microsomal triglyceride transfer protein (MTP) inhibitor and Ionis and Genzyme Corporation's, a Sanofi Company (Genzyme), Kynamro, a once-weekly injectable apoB antisense therapy. These agents have boxed warnings associated with liver toxicity and significant tolerability issues on their labels. Amgen's Repatha, an injectable PCSK9 inhibitor, was recently approved for HoFH, HeFH and ASCVD, and Sanofi's and Regeneron's PCSK9 inhibitor, Praluent, was recently approved for HeFH and ASCVD.

There are multiple product candidates in late stage development for HoFH, HeFH and ASCVD. CymaBay Therapeutic's (CymaBay) MBX-8025 (Phase 2), Regeneron's RGEN-1500 (Phase 2), and Madrigal's MGL-3196 (Phase 2) are in development for the treatment of HoFH. For hypercholesterolemia, including HeFH and ASCVD, drugs in development include oral CETPi, Merck's anacetrapib (Phase 3), Eli Lilly and Company's evacetrapib (recently discontinued Phase 3), and Amgen/Dezima's TA-8995 (Phase 2), current Esperion's oral product, ETC-1002 (completed Phase 2), The Medicines Company/Alnylam Pharmaceuticals, Inc.'s (Alnylam) injectable PCSK9 inhibitor, ALN-PCSsc (completed Phase 2), Eli Lilly's injectable PCSK9 inhibitor, LY3015014 (Phase 2), and Pfizer's injectable PCSK9 inhibitor bococizumab (recently discontinued Phase 3).

The market for LDL lowering therapy is both large and competitive, and the diagram below depicts the opportunity for gemcabene in 2nd line oral therapy, especially with discontinuation of competing oral CETPi and injectable PCSK9 inhibitor.

Competitive LDL-C Lowering Landscape

1st Line Oral Standard of Care

Statins (Lipitor & Crestor): LDL-C =-37 to -55% hsCRP=-35 to -41% TG=-10 to -52%

(Doubling statin dose adds 4%-6% efficacy with increased toxicities)

2nd Line Oral Approved Drugs (and Product Candidates in Development)

Ezetimibe (Zetia): LDL-C=-12 to -25% hsCRP=N/A TG=-5 to -9%

Gemcabene: LDL-C=-25 to -31% hsCRP=-26 to -54% TG=-39 to -60%

ETC-1002:

LDL-C=-24% hsCRP=-30% TG=N/E

CETPi: (2 of 5 remaining)*

LDL-C=-18 to -40% hsCRP=0 to +20% TG=-6%

Juxtapid: LDL-C=-40% hsCRP=↑ TG=-45% Box Warning/HoFH

3rd Line Injectables (PCSK9s and Antisense)

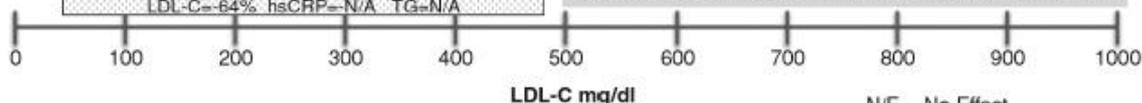
Praluent: LDL-C=-43 to -58% hsCRP=N/E TG=-10 to -17%

Repatha: LDL-C=-22 to -64% hsCRP=N/A TG=-15 to -20%

ALN-PCSSc

LDL-C=-64% hsCRP=N/A TG=N/A

Kynamro: LDL-C=-25% hsCRP=-40% TG=-18% Box Warning/HoFH



*Anacetrapib (Merck), TA-8995 (Dezima/Amgen)

N/E = No Effect
N/A = Not Available

Fibrates, niacin and prescription fish oil are common therapies used to lower triglycerides in patients with severe hypertriglyceridemia. Examples of branded fibrates include AbbVie Inc.'s (AbbVie) Tricor and Trilipix, and an example of a branded niacin includes AbbVie's Niaspan, an extended-release niacin. In addition, AbbVie markets combination therapies, such as Advicor (niacin extended release and lovastatin) and Simcor (niacin extended release and simvastatin). Prescribed generic versions of fibrates, such as gemfibrozil, are manufactured by many companies including Impax Laboratories, Inc. (Impax), Teva Pharmaceutical Industries Ltd. (Teva), Mylan and Lupin among others. Generic versions of niacins are manufactured by many companies including Teva, Lupin and Zydus Pharmaceuticals (USA), Inc., among others. Commonly used prescription fish oils include GlaxoSmithKline plc's (GlaxoSmithKline) Lovaza, AstraZeneca's Epanova and Amarin's Vascepa. Drugs that are in development for SHTG include Ionis' volanesorsen (Phase 2).

Currently there are currently no approved therapies for NASH and older medications are written off label to treat the disease. There are currently more than thirty assets in various stages of development for NASH. Several drug candidates are in late stage development and may be approved for the NASH indication as soon as 2019/2020: OCALIVA (Obeticholic Acid) (FXR Agonist) being developed by Intercept Pharmaceuticals, Inc., Elafibranor (PPAR Agonist) being developed by Genfit SA, Selonsertib (formerly GS-4997) (ASK-1 Inhibitor) being developed by Gilead Sciences, Inc., GS-0976 (ACC Inhibitor) being developed by Gilead Sciences, Inc., Cenicriviroc (CVC) (CCR2/CCR5 Inhibitor) being developed by Tobira Therapeutics, Inc. (a wholly-owned subsidiary of Allergan plc), Emricasan (Caspase Inhibitor) being developed by Conatus Pharmaceuticals Inc., Aramchol (Synthetic Fatty Acid/Bile Acid Conjugate) being developed by Galmed, GR-MD-02 (Galectin-3 Inhibitor) being developed by Galectin Therapeutics, and MGL-3196 (THR Agonist) being developed by Madrigal.

Government Regulation

Government authorities at the federal, state and local level in the United States and in other countries extensively regulate, among other things, the research, development, testing, manufacture (including any manufacturing changes),

packaging, storage, recordkeeping, labeling, advertising, promotion, distribution, marketing, post-approval monitoring and reporting, import and export of pharmaceutical products, such as those we are developing.

United States — FDA Regulation

FDA Approval Process

In the United States, pharmaceutical products are subject to extensive regulation by the FDA. The Federal Food, Drug and Cosmetic Act (FDCA) and other federal and state statutes and regulations, govern, among other things, the research, development, testing, manufacture, storage, recordkeeping, approval, labeling, promotion and marketing, distribution, post-approval monitoring and reporting, sampling, and import and export of pharmaceutical products. Failure to comply with applicable U.S. requirements may subject a company to a variety of administrative or judicial sanctions by the FDA, including FDA refusal to approve pending NDAs, partial or full clinical holds, warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties and criminal prosecution.

Pharmaceutical product development for a new product or certain changes to an approved product in the United States typically involves preclinical laboratory and animal tests, the submission of an investigational new drug application (IND) to the FDA, which must become effective before clinical trials may commence, and adequate and well-controlled clinical trials to establish the safety and effectiveness of the drug for each indication for which FDA approval is sought. Satisfaction of the FDA's pre-market approval requirements typically takes many years and the actual time required may vary substantially based upon the type, complexity and novelty of the product or disease.

Preclinical studies include laboratory evaluation of product chemistry, formulation and toxicity, as well as animal trials to assess the characteristics and potential safety and efficacy of the product. The conduct of the preclinical studies must comply with federal regulations and requirements, including good laboratory practices, or GLP. The results of preclinical studies are submitted to the FDA as part of an IND along with other information, including information about product chemistry, manufacturing and controls, available clinical data, and a proposed clinical trial protocol. Long term preclinical studies, such as animal tests of reproductive toxicity and carcinogenicity, may continue after the IND is submitted.

An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to one or more proposed clinical trials and places the trial on clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin.

Clinical trials involve the administration of the investigational new drug to healthy volunteers or patients under the supervision of a qualified investigator. Clinical trials must be conducted: (1) in compliance with federal regulations; (2) in compliance with good clinical practice (GCP), an international standard meant to protect the rights and health of patients and to define the roles of clinical trial sponsors, administrators and monitors; as well as (3) under protocols detailing the objectives of the trial, the parameters to be used in monitoring safety, and the effectiveness criteria to be evaluated. Each protocol involving testing on U.S. patients and subsequent protocol amendments must be submitted to the FDA as part of the IND.

The FDA may order the temporary or permanent discontinuation of a clinical trial at any time, or impose other sanctions if it believes that the clinical trial is either not being conducted in accordance with FDA requirements or presents an unacceptable risk to the clinical trial patients. The clinical trial protocol and informed consent information for patients in clinical trials must also be submitted to an IRB, for approval. An IRB must operate in compliance with FDA regulations. An IRB may also require the clinical trial at the site to be halted, either temporarily or permanently, for failure to comply with the IRB's requirements or may impose other conditions.

Clinical trials to support NDAs for marketing approval are typically conducted in three sequential phases, but the phases may overlap.

- Phase 1 trials: The drug is initially introduced into healthy volunteers or patients, with the target disease or condition. The drug is tested to assess metabolism, pharmacokinetics, pharmacological actions, side effects associated with increasing doses, and, if possible, early evidence of effectiveness.

- Phase 2 trials: The drug is administered to a limited patient population to determine the effectiveness of the drug for a particular indication, dosage tolerance, optimum dosage and to identify common adverse effects and safety risks.
- Phase 3 trials: If the drug demonstrates evidence of effectiveness and an acceptable safety profile in Phase 2 trials, Phase 3 trials, including registration trials, are undertaken to obtain additional information about clinical efficacy and safety in a larger number of patients, typically at geographically dispersed clinical trial sites, to permit the FDA to evaluate the overall benefit-risk relationship of the drug and to provide adequate information for the labeling of the drug. In most cases, the FDA requires two adequate and well-controlled Phase 3 registration trials to demonstrate the efficacy of the drug. A single Phase 3 registration trial with other confirmatory evidence may be sufficient in rare instances where the study is a large multicenter trial demonstrating internal consistency and a statistically very persuasive finding of a clinically meaningful effect on mortality, irreversible morbidity or prevention of a disease with a potentially serious outcome and confirmation of the result in a second trial would be practically or ethically impossible.

Progress reports detailing the results of the clinical trials must be submitted at least annually to the FDA and, more frequently, if SAEs occur. Phase 1, Phase 2 and Phase 3 trials may not be completed successfully within any specified period, or at all.

After completion of the required clinical trials, an NDA is prepared and submitted to the FDA. FDA approval of the NDA is required before marketing of the product may begin in the United States. The NDA must include, among other things, the results of all preclinical studies, clinical trials and other testing, a compilation of data relating to the product's pharmacology, chemistry, manufacture and controls, and the proposed product labeling. The cost of preparing and submitting an NDA is substantial. The submission of most NDAs is additionally subject to a substantial application user fee, currently exceeding \$2,374,000 for fiscal year 2016, and the manufacturer and/or applicant under an approved NDA are also subject to annual product and establishment user fees, currently exceeding \$114,000 per product and \$585,000 per establishment. These fees are typically increased annually.

The FDA has 60 days from its receipt of an NDA to determine whether the application will be accepted for filing based on the agency's threshold determination that it is sufficiently complete to permit substantive review. Once the submission is accepted for filing, the FDA begins an in-depth review. The FDA has agreed to certain performance goals in the review of new drug applications. Most such applications for standard review drug products are reviewed within ten to twelve months; most applications for priority review drugs are reviewed in six to eight months. Priority review can be applied to drugs that the FDA determines offer major advances in treatment, diagnosis, or prevention of diseases or provide a treatment where no adequate therapy exists. For biologics, priority review is further limited only for drugs intended to treat a serious or life-threatening disease relative to the currently approved products. The review process for both standard and priority review may be extended by the FDA for three additional months to consider certain late-submitted information, or information intended to clarify information already provided in the submission.

The FDA may also refer applications for novel drug products, or drug products that present difficult questions of safety or efficacy, to an advisory committee — typically a panel that includes clinicians and other experts — for review, evaluation and a recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations. Before approving an NDA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP. Additionally, the FDA will inspect the facility or the facilities at which the drug is manufactured. The FDA will not approve the product unless it is compliant with cGMP, is satisfactory and the NDA contains data that provide substantial evidence that the drug is safe and effective in the indication studied.

After the FDA evaluates the NDA and the manufacturing facilities, it issues either an approval letter or a complete response letter. A complete response letter generally outlines the deficiencies in the submission and may require substantial additional testing, or information, in order for the FDA to reconsider the application. If, or when, those deficiencies have been addressed to the FDA's satisfaction in a resubmission of the NDA, the FDA will issue an approval letter. The FDA has committed to reviewing such resubmissions in two or six months depending on the type of information included.

An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. Even if the FDA approves a product, it may limit the approved indications for use for the product, require that contraindications, warnings or precautions be included in the product labeling, or require that post-approval studies,

including Phase 4 clinical trials, be conducted to further assess a drug's safety after approval. As a condition of NDA approval, the FDA may also require a risk evaluation and mitigation strategy (REMS) to help ensure that the benefits of the drug outweigh the potential risks. REMS can include medication guides, communication plans for healthcare professionals, and elements to assure safe use. Elements to assure safe use can include, but are not limited to, special training or certification for prescribing or dispensing, dispensing only under certain circumstances, special monitoring, and the use of patient registries. The requirement for a REMS can materially affect the potential market and profitability of the drug. Moreover, product approval may require substantial post-approval testing and surveillance to monitor the drug's safety or efficacy. Once granted, product approvals may be withdrawn if compliance with regulatory standards is not maintained or problems are identified following initial marketing.

Changes to some of the conditions established in an approved application, including changes in indications, labeling, or manufacturing processes or facilities, require submission and FDA approval of a new NDA or NDA supplement before the change can be implemented. An NDA supplement for a new indication typically requires clinical data similar to that in the original application, and the FDA uses the same procedures and actions in reviewing NDA supplements as it does in reviewing NDAs.

Fast Track Designation and Accelerated Approval

The FDA is required to facilitate the development, and expedite the review, of drugs that are intended for the treatment of a serious or life-threatening disease or condition for which there is no effective treatment and which demonstrate the potential to address unmet medical needs for the condition. Under the fast track program, the sponsor of a new product candidate may request that the FDA designate the product candidate for a specific indication as a fast track drug concurrent with, or after, the filing of the IND for the product candidate. The FDA must determine if the product candidate qualifies for fast track designation within 60 days of receipt of the sponsor's request.

Under the fast track program and the FDA's accelerated approval regulations, the FDA may approve a drug for a serious or life-threatening illness that provides meaningful therapeutic benefit to patients over existing treatments based upon a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments.

In clinical trials, a surrogate endpoint is a measurement of laboratory or clinical signs of a disease or condition that substitutes for a direct measurement of how a patient feels, functions, or survives. Surrogate endpoints can often be measured more easily or more rapidly than clinical endpoints. A product candidate approved on this basis is subject to rigorous post-marketing compliance requirements, including the completion of Phase 4 or post-approval clinical trials to confirm the effect on the clinical endpoint. Failure to conduct required post-approval studies, or confirm a clinical benefit during post-marketing studies, will allow FDA to withdraw the drug from the market on an expedited basis. All promotional materials for product candidates approved under accelerated regulations are subject to prior review by FDA.

In addition to other benefits such as the ability to use surrogate endpoints and engage in more frequent interactions with the FDA, the FDA may initiate review of sections of a fast track drug's NDA before the application is complete. This rolling review is available if the applicant provides, and the FDA approves, a schedule for the submission of the remaining information and the applicant pays applicable user fees. However, the FDA's time period goal for reviewing an application does not begin until the last section of the NDA is submitted. Additionally, the fast track designation may be withdrawn by the FDA if the FDA believes that the designation is no longer supported by data emerging in the clinical trial process.

Breakthrough Therapy Designation

The FDA is also required to expedite the development and review of the application for approval of drugs that are intended to treat a serious or life-threatening disease or condition where preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints. Under the breakthrough therapy program, the sponsor of a new product candidate may request that the FDA designate the product candidate for a specific indication as a breakthrough therapy concurrent with, or after, the filing of the IND for the product candidate. The FDA must determine if the product candidate qualifies for breakthrough therapy designation within 60 days of receipt of the sponsor's request. The FDA must take certain actions, such as holding timely meetings and providing advice, intended to expedite the development and review of an application for approval of

a breakthrough therapy. Even if a product qualifies for this program, the FDA may later decide that the product no longer meets the conditions for qualification.

Orphan Drugs

Under the Orphan Drug Act, the FDA may grant orphan drug designation to drugs intended to treat a rare disease or condition — generally a disease or condition that affects fewer than 200,000 individuals in the U.S. Orphan Drug Designation must be requested before submitting an NDA. After the FDA grants orphan drug designation, the generic identity of the drug and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. The first NDA applicant to receive FDA approval for a particular active ingredient to treat a particular disease with FDA orphan drug designation is entitled to a seven-year exclusive marketing period in the United States for that product, for that indication. During the seven-year exclusivity period, the FDA may not approve any other applications to market the same drug for the same disease, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity. Orphan drug exclusivity does not prevent the FDA from approving a different drug for the same disease or condition, or the same drug for a different disease or condition. Among the other benefits of orphan drug designation are tax credits for certain research and a waiver of the NDA application user fee.

Pediatric Information

Under the Pediatric Research Equity Act (PREA), NDAs or supplements to NDAs must contain data to assess the safety and effectiveness of the drug for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the drug is safe and effective. The FDA may grant full or partial waivers for submission of data, as well as deferrals for several reasons, including a finding that the drug is ready for approval for use in adults before pediatric studies are complete or that additional safety or effectiveness data needs to be collected before the pediatric studies begin. Unless otherwise required by regulation, PREA does not apply to any drug for an indication for which orphan designation has been granted.

The Best Pharmaceuticals for Children Act (BPCA) provides NDA holders a six-month extension of any exclusivity — patent or non-patent — for a drug if certain conditions are met. Conditions for exclusivity include the FDA's determination that information relating to the use of a new drug in the pediatric population may produce health benefits in that population, the FDA making a written request for pediatric studies, and the applicant agreeing to perform, and reporting on, the requested studies within the statutory timeframe. Applications under the BPCA are treated as priority applications, with all of the benefits that designation confers.

Special Protocol Assessment

A company may reach an agreement with the FDA under the Special Protocol Assessment (SPA) process as to the required design and size of clinical trials intended to form the primary basis of an efficacy claim. Under the FDC Act and FDA guidance implementing the statutory requirement, an SPA is generally binding upon the FDA except in limited circumstances, such as if the FDA identifies a substantial scientific issue essential to determining safety or efficacy after the clinical trial begins, public health concerns emerge that were unrecognized at the time of the protocol assessment, the sponsor and FDA agree to the change in writing, or if the clinical trial sponsor fails to follow the protocol that was agreed upon with the FDA.

Disclosure of Clinical Trial Information

Sponsors of clinical trials of FDA-regulated products, including drugs, are required to register and disclose certain clinical trial information. Information related to the product, patient population, phase of investigation, clinical trial sites and investigators, and other aspects of the clinical trial is then made public as part of the registration. Sponsors are also obligated to discuss the results of their clinical trials after completion. Disclosure of the results of these trials can be delayed until the new product or new indication being studied has been approved. Competitors may use this publicly-available information to gain knowledge regarding the progress of development programs.

Post-Approval Requirements

Once an NDA is approved, a product will be subject to certain post-approval requirements. For instance, the FDA closely regulates the post-approval marketing and promotion of drugs, including standards and regulations for

direct-to-consumer advertising, off-label promotion, industry-sponsored scientific and educational activities and promotional activities involving the internet. Drugs may be marketed only for the approved indications and in accordance with the provisions of the approved labeling.

AE reporting and submission of periodic reports is required following FDA approval of an NDA. The FDA also may require post-marketing testing, known as Phase 4 testing, REMS and surveillance to monitor the effects of an approved product, or the FDA may place conditions on an approval that could restrict the distribution or use of the product. In addition, quality-control, drug manufacture, packaging and labeling procedures must continue to conform to cGMPs after approval. Drug manufacturers and certain of their subcontractors are required to register their establishments with the FDA and certain state agencies. Registration with the FDA subjects entities to periodic unannounced inspections by the FDA, during which the agency inspects manufacturing facilities to assess compliance with cGMPs. Accordingly, manufacturers must continue to expend time, money and effort in the areas of production and quality-control to maintain compliance with cGMPs. Regulatory authorities may withdraw product approvals or request product recalls if a company fails to comply with regulatory standards, if it encounters problems following initial marketing, or if previously unrecognized problems are subsequently discovered.

The Hatch-Waxman Amendments

Orange Book Listing

In seeking approval for a drug through an NDA, applicants are required to list with the FDA each patent whose claims cover the applicant's product. Upon approval of a drug, each of the patents listed in the application for the drug is then published in the FDA's Approved Drug Products with Therapeutic Equivalence Evaluations, commonly known as the Orange Book. Drugs listed in the Orange Book can, in turn, be cited by potential generic competitors in support of approval of an abbreviated new drug application (ANDA). An ANDA provides for marketing of a drug product that has the same active ingredient in the same strength, route of administration and dosage form as the listed drug and has been shown to be bioequivalent to the listed drug. Other than the requirement for bioequivalence testing, ANDA applicants are not required to conduct, or submit results of, preclinical studies or clinical trials to prove the safety or effectiveness of their drug product. Drugs approved in this way are commonly referred to as "generic equivalents" to the listed drug, and can often be substituted by pharmacists under prescriptions written for the original listed drug.

The ANDA applicant is required to certify to the FDA concerning any patents listed for the approved product in the FDA's Orange Book. Specifically, the applicant must certify that: (1) the required patent information has not been filed; (2) the listed patent has expired; (3) the listed patent has not expired, but will expire on a particular date and approval is sought after patent expiration; or (4) the listed patent is invalid or will not be infringed by the new product. The ANDA applicant may also elect to submit a section viii statement certifying that its proposed ANDA label does not contain (or carves out) any language regarding the patented method-of-use rather than certify to a listed method-of-use patent. If the applicant does not challenge the listed patents, the ANDA application will not be approved until all the listed patents claiming the referenced product have expired.

A certification that the new product will not infringe the already approved product's listed patents, or that such patents are invalid, is called a Paragraph IV certification. If the ANDA applicant has provided a Paragraph IV certification to the FDA, the applicant must also send notice of the Paragraph IV certification to the NDA and patent holders once the ANDA has been accepted for filing by the FDA. The NDA and patent holders may then initiate a patent infringement lawsuit in response to the notice of the Paragraph IV certification. The filing of a patent infringement lawsuit within 45 days of the receipt of a Paragraph IV certification automatically prevents the FDA from approving the ANDA until the earlier of 30 months, expiration of the patent, settlement of the lawsuit, or a decision in the infringement case that is favorable to the ANDA applicant.

The ANDA application also will not be approved until any applicable non-patent exclusivity listed in the Orange Book for the referenced product has expired.

Exclusivity

Upon NDA approval of a drug containing a NCE, which is a drug substance that contains an active moiety that has not been approved by the FDA in any other NDA, that moiety will receive five years of marketing exclusivity during which the FDA cannot approve any ANDA seeking approval of a generic version of that moiety. Certain changes to a drug,

such as the addition of a new indication to the package insert, may receive a three-year period of exclusivity during which the FDA cannot approve an ANDA for a generic drug that includes the change.

If no Paragraph IV certification is made, an ANDA may not be filed until expiry of the NCE exclusivity period, however, if a Paragraph IV certification is filed, the ANDA may be submitted one year before the NCE exclusivity period expires. If there is no listed patent in the Orange Book, there may not be a Paragraph IV certification, and, thus, no ANDA may be filed before the expiration of the exclusivity period.

Patent Term Extension

After NDA approval, owners of relevant drug patents may apply for up to a five year patent extension. The allowable patent term extension is calculated as half of the drug's testing phase — the time between IND application and NDA submission — and all of the review phase — the time between NDA submission and approval up to a maximum of five years. The time can be shortened if the FDA determines that the applicant did not pursue approval with due diligence. The extension may not extend the patent beyond 14 years from market approval.

For patents that might expire during the application phase, the patent owner may request an interim patent extension. An interim patent extension increases the patent term by one year and may be renewed up to four times. For each interim patent extension granted, the post-approval patent extension is reduced by one year. The director of the USPTO must determine that approval of the drug covered by the patent for which a patent extension is being sought is likely. Interim patent extensions are not available for a drug for which an NDA has not been submitted.

Prescription Drug Marketing Act

As part of the sales and marketing process, pharmaceutical companies frequently provide samples of approved drugs to physicians. The Prescription Drug Marketing Act (PDMA) imposes requirements and limitations upon the provision of drug samples to physicians, as well as prohibits states from licensing distributors of prescription drugs unless the state licensing program meets certain federal guidelines that include minimum standards for storage, handling and record keeping. In addition, the PDMA sets forth civil and criminal penalties for violations.

United States — Anti-Kickback, False Claims Laws and Other Healthcare Laws

In addition to FDA restrictions on marketing of pharmaceutical products, several other types of state and federal laws have been applied to restrict certain general business and marketing practices in the pharmaceutical industry in recent years. These laws include anti-kickback statutes, false claims statutes and other statutes pertaining to health care fraud and abuse.

The federal Anti-Kickback Statute prohibits, among other things, knowingly and willfully offering, paying, soliciting or receiving remuneration to induce, or in return for, purchasing, leasing, ordering or arranging for the purchase, lease or order of any healthcare item or service reimbursable under Medicare, Medicaid, or other federally financed healthcare programs. The Patient Protection and Affordable Care Act as amended by the Health Care and Education Reconciliation Act (PPACA) amended the intent element of the federal Anti-Kickback Statute so that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it in order to be in violation. This statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers and formulary managers on the other. Although there are a number of statutory exemptions and regulatory safe harbors protecting certain common activities from prosecution or other regulatory sanctions, the exemptions and safe harbors are drawn narrowly, and practices that involve remuneration intended to induce prescribing, purchases, or recommendations may be subject to scrutiny if they do not qualify for an exemption or safe harbor. Violations of the Anti-Kickback Statute are punishable by penalties including imprisonment, criminal fines, civil monetary penalties, damages, disgorgement and exclusion from participation in federal healthcare programs.

Federal false claims laws, including the civil False Claims Act, prohibit any person or entity from knowingly presenting, or causing to be presented, a false claim for payment to the federal government, or knowingly making, or causing to be made, a false statement to have a false claim paid. This includes claims made to programs where the federal government reimburses, such as Medicaid, as well as programs where the federal government is a direct purchaser, such as when it purchases off the Federal Supply Schedule. Recently, several pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly inflating drug prices they report to pricing services, which in turn were used by the government to set Medicare and Medicaid reimbursement rates, and for allegedly providing free product to

customers with the expectation that the customers would bill federal programs for the product. In addition, certain marketing practices, including off-label promotion, may also violate false claims laws. Additionally, PPACA amended the federal Anti-Kickback Statute such that a violation of that statute can serve as a basis for liability under the federal civil False Claims Act. The majority of states also have statutes or regulations similar to the federal Anti-Kickback Statute and False Claims Act, which apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor.

Other federal statutes pertaining to healthcare fraud and abuse include the Civil Monetary Penalties Statute, which prohibits the offer or payment of remuneration to a Medicaid or Medicare beneficiary that the offerer/payor knows or should know is likely to influence the beneficiary to order a reimbursable item or service from a particular supplier, and the healthcare fraud provisions of the Health Insurance Portability and Accountability Act of 1996 (HIPAA), which prohibits knowingly and willfully executing or attempting to execute a scheme to defraud any healthcare benefit program or obtain by means of false or fraudulent pretenses, representations, or promises any money or property owned by or under the control of any healthcare benefit program in connection with the delivery of or payment for healthcare benefits, items, or services.

For example, several pharmaceutical and other healthcare companies have been prosecuted under these laws for, among other things, allegedly inflating drug prices they report to pricing services, which in turn were used by the government to set Medicare and Medicaid reimbursement rates, and for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. In addition, certain marketing practices undertaken by pharmaceutical companies, including off-label promotion, may violate false claims laws.

Pursuant to PPACA, the Centers for Medicare & Medicaid Services (CMS) has issued a final rule that requires manufacturers of certain prescription drugs, devices, biologics, and medical supplies for which payment is available under Medicare, Medicaid, or the Children's Health Insurance Program, with specific exceptions, to collect and report information on payments or transfers of value to physicians and teaching hospitals, as well as investment interests held by physicians and their immediate family members. The first reports were due in 2014 and must be submitted on an annual basis. The reported data were posted by CMS in searchable form on a public website on September 30, 2014, and will be posted on an annual basis. Failure to submit required information may result in civil monetary penalties.

In addition, several states now require prescription drug companies to report expenses relating to the marketing and promotion of drug products and to report gifts and payments to individual physicians in these states. Other states prohibit various other marketing-related activities. Still other states require the posting of information relating to clinical studies and their outcomes. In addition, California, Connecticut, Nevada and Massachusetts require pharmaceutical companies to implement compliance programs and/or marketing codes. Several additional states are considering similar proposals. Compliance with these laws is difficult and time consuming, and companies that do not comply with these state laws may face civil penalties.

Other federal and state requirements include the following:

- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act (the HITECH Act) and its implementing regulations, which imposes obligations, including mandatory contractual terms, on certain people and entities with respect to safeguarding the privacy, security and transmission of individually identifiable health information; and
- State and foreign laws also govern the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

United States Healthcare Reform

Current and future legislative proposals to further reform healthcare or reduce healthcare costs may result in lower reimbursement for our products. The cost containment measures that payors and providers are instituting and the effect of any healthcare reform initiative implemented in the future could significantly reduce our revenues from the sale of our products.

For example, in March 2010, PPACA was signed into law. PPACA has begun to, and will likely continue to, substantially change healthcare financing and delivery by both governmental and private insurers, and significantly impact the pharmaceutical industry. The PPACA, among other things: established an annual, nondeductible fee on any

entity that manufactures or imports certain specified branded prescription drugs and biologic agents; revised the methodology by which rebates owed by manufacturers to the state and federal government for covered outpatient drugs under the Medicaid Drug Rebate Program are calculated; increased the minimum Medicaid rebates owed by most manufacturers under the Medicaid Drug Rebate Program; extended the Medicaid Drug Rebate program to utilization of prescriptions of individuals enrolled in Medicaid managed care organizations; implemented a new Medicare Part D coverage gap discount program; expanded the entities eligible for discounts under the Public Health Services pharmaceutical pricing program; created a new Patient Centered Outcomes Research Institute; and provided incentives to programs that increase the federal government's comparative effectiveness research.

In addition, other legislative changes have been proposed and adopted since the PPACA was enacted. In August 2011, President Obama signed into law the Budget Control Act of 2011, which, among other things, created the Joint Select Committee on Deficit Reduction to recommend to Congress proposals in spending reductions. The Joint Select Committee did not achieve a targeted deficit reduction of at least \$1.2 trillion for the years 2012 through 2021, triggering the legislation's automatic reduction to several government programs. This includes reductions to Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013 and will remain in effect through 2025 unless additional Congressional action is taken. Additionally, in January 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, which, among other things, reduced Medicare payments to several providers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

With the election of President Donald J. Trump in November and his inauguration in January 2017, we expect that additional state and federal healthcare reform measures will be adopted in the future, including the possible repeal and replacement of PPACA and related legislation, regulations and programs. Any new state and federal healthcare reform measures could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our products or additional pricing pressure. We are unsure of the ways in which PPACA will continue to be challenged, repealed, amended or replaced in the months and years to come.

Review and Approval of Drug Products in the European Union

In order to market any product outside of the United States, a company must also comply with numerous and varying regulatory requirements of other countries and jurisdictions regarding quality, safety and efficacy and governing, among other things, clinical trials, marketing authorization, commercial sales and distribution of drug products. Whether or not it obtains FDA approval for a product, the company would need to obtain the necessary approvals by the comparable foreign regulatory authorities before it can commence clinical trials or marketing of the product in those countries or jurisdictions. The approval process ultimately varies between countries and jurisdictions and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries and jurisdictions might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country or jurisdiction does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country or jurisdiction may negatively impact the regulatory process in others.

Pursuant to the European Clinical Trials Directive, a system for the approval of clinical trials in the European Union has been implemented through national legislation of the member states. Under this system, an applicant must obtain approval from the competent national authority of a European Union member state in which the clinical trial is to be conducted. Furthermore, the applicant may only start a clinical trial after a competent ethics committee has issued a favorable opinion. Clinical trial application must be accompanied by an investigational medicinal product dossier with supporting information prescribed by the European Clinical Trials Directive and corresponding national laws of the member states and further detailed in applicable guidance documents.

To obtain marketing approval of a drug under European Union regulatory systems, an applicant must submit a marketing authorization application (MAA) either under a centralized or decentralized procedure.

The centralized procedure provides for the grant of a single marketing authorization by the European Commission that is valid for all European Union member states. The centralized procedure is compulsory for specific products, including for medicines produced by certain biotechnological processes, products designated as orphan medicinal products, advanced therapy products and products with a new active substance indicated for the treatment of certain diseases. For products with a new active substance indicated for the treatment of other diseases and products that are highly innovative or for which a centralized process is in the interest of patients, the centralized procedure may be optional.

Under the centralized procedure, the Committee for Medicinal Products for Human Use, or the CHMP, established at the European Medicines Agency (EMA) is responsible for conducting the initial assessment of a drug. The CHMP is also responsible for several post-authorization and maintenance activities, such as the assessment of modifications or extensions to an existing marketing authorization. Under the centralized procedure in the European Union, the maximum timeframe for the evaluation of an MAA is 210 days, excluding clock stops, when additional information or written or oral explanation is to be provided by the applicant in response to questions of the CHMP. Accelerated evaluation might be granted by the CHMP in exceptional cases, when a medicinal product is of major interest from the point of view of public health and in particular from the viewpoint of therapeutic innovation. In this circumstance, the EMA ensures that the opinion of the CHMP is given within 150 days.

The decentralized procedure is available to applicants who wish to market a product in various European Union member states where such product has not received marketing approval in any European Union member states before. The decentralized procedure provides for approval by one or more other, or concerned, member states of an assessment of an application performed by one member state designated by the applicant, known as the reference member state. Under this procedure, an applicant submits an application based on identical dossiers and related materials, including a draft summary of product characteristics, and draft labeling and package leaflet, to the reference member state and concerned member states. The reference member state prepares a draft assessment report and drafts of the related materials within 210 days after receipt of a valid application. Within 90 days of receiving the reference member state's assessment report and related materials, each concerned member state must decide whether to approve the assessment report and related materials.

If a member state cannot approve the assessment report and related materials on the grounds of potential serious risk to public health, the disputed points are subject to a dispute resolution mechanism and may eventually be referred to the European Commission, whose decision is binding on all member states.

Data and Market Exclusivity in the European Union

In the European Union, NCEs qualify for eight years of data exclusivity upon marketing authorization and an additional two years of market exclusivity. This data exclusivity, if granted, prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic (abbreviated) application for eight years, after which generic marketing authorization can be submitted, and the innovator's data may be referenced, but not approved for two years. The overall ten-year period will be extended to a maximum of eleven years if, during the first eight years of those ten years, the marketing authorization (MA) holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are held to bring a significant clinical benefit in comparison with existing therapies. Even if a compound is considered to be a NCE and the sponsor is able to gain the prescribed period of data exclusivity, another company nevertheless could also market another version of the drug if such company can complete a full MAA with a complete database of pharmaceutical test, preclinical studies and clinical trials and obtain marketing approval of its product.

Data and Market Exclusivity in Japan

Japan has no established system for data exclusivity or marketing exclusivity. However, the Pharmaceuticals Act of Japan (PAA) provides for a re-examination system after drug approval. This system imposes an obligation on the MA holder to continue to collect clinical data after market approval during a study period. The MA holder must apply for reexamination to the Minister of Health Labor and Welfare within three months of the expiration of the study period. During the study and reexamination period no generic drug may be approved, effectively providing a form of market exclusivity. The study period is determined by the drug category. The study period for an orphan drug is 10 years from MA, the study period for an NCE is eight years from MA, and for an improvement (new indication, formulation, etc.) the study period is four to six years from MA.

Patent Term Extension in Japan

The term of a patent that covers the approved drug may be extended for the shorter of five years, or the period during which the patent could not be worked (exploited) due to obtaining regulatory approval. This period is calculated from the later of the patent registration date (grant date) or the clinical trial start date to the regulatory approval date.

Foreign Regulation

In order to market any product outside of the United States, we would need to comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy and governing, among other things, clinical trials, marketing authorization, commercial sales and distribution of our products. Whether or not we obtain FDA approval for a product, we would need to obtain the necessary approvals by the comparable regulatory authorities of foreign countries before we can commence clinical trials or marketing of the product in those countries. The approval process varies from country to country and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country may negatively impact the regulatory process in others.

Pharmaceutical Coverage, Pricing and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any drug products for which we obtain regulatory approval. Sales of any of our product candidates, if approved, will depend, in part, on the extent to which the costs of the products will be covered by third-party payors, including government health programs such as Medicare and Medicaid, commercial health insurers and managed care organizations. The process for determining whether a payor will provide coverage for a drug product may be separate from the process for setting the price or reimbursement rate that the payor will pay for the drug product once coverage is approved. Third-party payors may limit coverage to specific drug products on an approved list, or formulary, which might not include all of the approved drugs for a particular indication.

In order to secure coverage and adequate reimbursement for any product that might be approved for sale, we may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of the product, in addition to the costs required to obtain FDA or other comparable regulatory approvals. Our product candidates may not be considered medically necessary or cost-effective. A payor's decision to provide coverage for a drug product does not imply that an adequate reimbursement rate will be approved. Further, one payor's determination to provide coverage for a drug product does not assure that other payors will also provide coverage or adequate reimbursement for the drug product. Third-party reimbursement may not be sufficient to enable us to maintain price levels high enough to realize an appropriate return on our investment in product development.

The containment of healthcare costs has become a priority of federal, state and foreign governments, and the prices of drugs have been a focus in this effort. Third-party payors are increasingly challenging the prices charged for medical products and services and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy. If these third-party payors do not consider our products to be cost-effective compared to other available therapies, they may not cover our products after approval as a benefit under their plans or, if they do, the level of payment may not be sufficient to allow us to sell our products at a profit. The U.S. government, state legislatures and foreign governments have shown significant interest in implementing cost containment programs to limit the growth of government-paid health care costs, including price controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs. Adoption of such controls and measures, and tightening of restrictive policies in jurisdictions with existing controls and measures, could limit payments for pharmaceuticals such as the product candidates that we are developing and could adversely affect our net revenue and results.

Pricing and reimbursement schemes vary widely from country to country. Some countries provide that drug products may be marketed only after a reimbursement price has been agreed. Some countries may require the completion of additional studies that compare the cost-effectiveness of a particular product candidate to currently available therapies. For example, the European Union provides options for its member states to restrict the range of drug products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. European Union member states may approve a specific price for a drug product or may instead adopt a system of direct or indirect controls on the profitability of the company placing the drug product on the market. Other member states allow companies to fix their own prices for drug products, but monitor and control company profits. The downward pressure on health care costs in general, particularly prescription drugs, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross-border imports from low-priced markets exert competitive pressure that may reduce pricing within a country. There can be no assurance that any country that has price controls or reimbursement limitations for drug products will allow favorable reimbursement and pricing arrangements for any of our products.

The marketability of any products for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide coverage and adequate reimbursement. In addition, the emphasis on managed care in the United States has increased and we expect will continue to increase the pressure on drug pricing. Coverage policies, third-party reimbursement rates and drug pricing regulation may change at any time. In particular, the PPACA contains provisions that may reduce the profitability of drug products, including, for example, increased rebates for drugs sold to Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal health care programs. Even if favorable coverage status and adequate reimbursement level status are obtained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

Employees

As of February 20, 2017, we had sixteen employees, all of whom are full-time, four of whom hold Ph.D. or M.D. degrees, nine of whom were engaged in research and development activities and seven of whom were engaged in business development, finance, information systems, facilities, human resources or administrative support. None of our employees is represented by a labor union or subject to a collective bargaining agreement. We consider our relationship with our employees to be good.

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, MI 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 Report, and the inclusion of our website address in this Report is an inactive textual reference only.

ITEM 1A. RISK FACTORS

Our business, prospects, financial condition or results of operations could be materially adversely affected by any of the risks and uncertainties set forth below, as well as in any amendments or updates reflected in subsequent filings with the Securities and Exchange Commission (SEC). In assessing these risks, you should also refer to other information contained in this Report, including our financial statements and related notes.

Risks Related to the Development of Gemcabene or any Future Product Candidate

We currently depend entirely on the success of gemcabene, our only product candidate. We may never receive marketing approval for, or successfully commercialize, gemcabene for any indication.

We currently have only one product candidate, gemcabene, in clinical development, and our business depends on its successful clinical development, regulatory approval and commercialization. The research, testing, manufacturing, labeling, approval, sale, marketing and distribution of a drug product are subject to extensive regulation by the FDA and other regulatory authorities in the United States and other countries, where regulations differ from country to country. We are not permitted to market gemcabene in the United States until we receive approval of a new drug application (NDA) from the FDA or in any foreign countries until we receive the requisite approval from such countries. We have not submitted an NDA to the FDA or comparable applications to other regulatory authorities or received marketing approval for gemcabene. Before obtaining regulatory approval for the commercial sale of gemcabene for a particular indication, we must demonstrate through preclinical testing and clinical trials that gemcabene is safe and effective for use in that target indication. This process can take many years and may be followed by post-marketing studies and surveillance, which will require the expenditure of substantial resources beyond our current cash and cash equivalents. Of the large number of drugs in development in the United States, only a small percentage of drugs successfully complete the FDA regulatory approval process and are commercialized. Accordingly, even if we are able to complete development of gemcabene, we cannot assure you that gemcabene will be approved or commercialized.

Obtaining approval of an NDA is an extensive, lengthy, expensive and uncertain process, and the FDA may delay, limit or deny approval of gemcabene for many reasons, including:

- the data collected from preclinical studies and clinical trials of gemcabene may not be sufficient to support the submission of an NDA;
- we may not be able to demonstrate to the satisfaction of the FDA that gemcabene is safe and effective for any indication;
- the results of clinical trials may not meet the level of statistical significance or clinical significance required by the FDA for approval;
- the FDA may disagree with the number, design, size, conduct or implementation of our clinical trials;
- the FDA may not find the data from preclinical studies and clinical trials sufficient to demonstrate that gemcabene's clinical and other benefits outweigh its safety risks;
- the FDA may disagree with our interpretation of data from preclinical studies or clinical trials;
- the FDA may not accept data generated at our clinical trial sites;
- the FDA may have difficulties scheduling an advisory committee meeting in a timely manner or the advisory committee may recommend against approval of our application or may recommend that the FDA require, as a condition of approval, additional preclinical studies or clinical trials, limitations on approved labeling or distribution and use restrictions;
- the FDA may require development of a risk evaluation and mitigation strategy (REMS) as a condition of approval;
- the FDA may identify deficiencies in the manufacturing processes or facilities of third party manufacturers with which we enter into agreements for clinical and commercial supplies; or
- the FDA may change its approval policies or adopt new regulations.

The results of previous clinical trials may not be predictive of future results, and the results of our current and planned clinical trials may not satisfy the requirements of the FDA or non-U.S. regulatory authorities.

The results from the prior preclinical studies and clinical trials for gemcabene discussed elsewhere in this report may not necessarily be predictive of the results of future preclinical studies or clinical trials. Even if we are able to complete our planned clinical trials of gemcabene according to our current development timeline, the results from our prior clinical trials of gemcabene may not be replicated in these future trials. Many companies in the pharmaceutical and biotechnology industries (including those with greater resources and experience than us) have suffered significant setbacks in late-stage clinical trials after achieving positive results in early stage development, and we cannot be certain that we will not face similar setbacks. These setbacks have been caused by, among other things, preclinical findings made while clinical trials were underway or safety or efficacy observations made in clinical trials, including previously unreported AEs. Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that believed their product candidates performed satisfactorily in preclinical studies and clinical trials nonetheless have failed to obtain FDA approval. If we fail to produce positive results in our clinical trials of gemcabene, the development timeline and regulatory approval and commercialization prospects for gemcabene and our business and financial prospects, would be adversely affected.

Further, gemcabene may not be approved even if it achieves its primary endpoint in Phase 3 registration trials. The FDA or non-U.S. regulatory authorities may disagree with our trial design and our interpretation of data from preclinical studies and clinical trials. In addition, any of these regulatory authorities may change requirements for the approval of a product candidate even after reviewing and providing comments or advice on a protocol for a pivotal clinical trial that has the potential to result in approval by the FDA or another regulatory authority. Furthermore, any of these regulatory

authorities may also approve our product candidate for fewer or more limited indications than we request or may grant approval contingent on the performance of costly post-marketing clinical trials.

We commenced three Phase 2b clinical trials in 2016 and plan to initiate a fourth Phase 2 clinical trial in 2017. If successful, we plan to eventually seek regulatory approvals of gemcabene initially in the United States, Canada and Europe, and we may seek approvals in other geographies. Before obtaining regulatory approvals for the commercial sale of any product candidate for any target indication, we must demonstrate with substantial evidence gathered in preclinical studies and adequate and well-controlled clinical studies, and, with respect to approval in the United States, to the satisfaction of the FDA, that the product candidate is safe and effective for use for that target indication. We cannot assure you that the FDA or non-U.S. regulatory authorities would consider our planned clinical trials to be sufficient to serve as the basis for approval of gemcabene for any indication. The FDA and non-U.S. regulatory authorities retain broad discretion in evaluating the results of our clinical trials and in determining whether the results demonstrate that gemcabene is safe and effective. If we are required to conduct clinical trials of gemcabene in addition to those we have planned prior to approval, such as a cardiovascular outcomes trial, we will need substantial additional funds, and we cannot assure you that the results of any such outcomes trial or other clinical trials will be sufficient for approval.

If clinical trials of gemcabene or any future product candidate fail to demonstrate safety and efficacy to the satisfaction of regulatory authorities or do not otherwise produce positive results, we may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of such product candidate.

Before obtaining marketing approval from regulatory authorities for the sale of gemcabene, we must complete preclinical development (including, but not limited to, two-year rat and mouse carcinogenicity studies), and supportive pharmacology studies and Phase 2 and Phase 3 clinical trials to demonstrate the safety and efficacy in humans. Preclinical development and extensive clinical trials will also be required before obtaining marketing approval from regulatory authorities for any other product candidate we may pursue in the future. Clinical testing is expensive, difficult to design and implement, can take many years to complete and is uncertain as to outcome. A failure of one or more clinical trials can occur at any stage of development.

We, or our future collaborators, may experience numerous unforeseen events during, or as a result of, clinical trials that could result in increased development costs, delay, limit or prevent our ability to receive marketing approval or commercialize gemcabene or any other product candidate we may pursue in the future, including:

- regulators or institutional review boards (IRBs) may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- government or regulatory delays and changes in regulatory requirements, policy and guidelines may require us to perform additional clinical trials or use substantial additional resources to obtain regulatory approval;
- we may have delays in reaching or fail to reach agreement on acceptable clinical trial contracts or clinical trial protocols with prospective trial sites;
- clinical trials may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical trials or abandon product development programs;
- the number of patients required for clinical trials may be larger than we anticipate, enrollment in these clinical trials may be slower than we anticipate or participants may drop out of these clinical trials at a higher rate than we anticipate;
- our third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all;
- our patients or medical investigators may be unwilling to follow our clinical trial protocols;
- we might have to suspend or terminate clinical trials for various reasons, including a finding that the participants are being exposed to unacceptable health risks;

- the cost of clinical trials may be greater than we anticipate;
- the supply or quality of any product candidate or other materials necessary to conduct clinical trials may be insufficient or inadequate; and
- the product candidate may have undesirable side effects or other unexpected characteristics, causing us or our investigators, regulators or IRBs to suspend or terminate the trials.

If we experience delays or difficulties in the enrollment of patients in clinical trials, our receipt of necessary regulatory approvals could be delayed or prevented.

We or our future collaborators may not be able to initiate or continue clinical trials for gemcabene or any future product candidate if we are unable to locate and enroll a sufficient number of eligible patients to participate in these trials as required by the FDA or analogous regulatory authorities outside the United States. Orphan indications, in particular, have small populations, and it may be difficult for us to locate and enroll sufficient patients in trials for orphan-designated indications. Patient enrollment can be affected by many factors, including:

- severity of the disease under investigation;
- availability and efficacy of medications already approved for the disease under investigation;
- eligibility criteria for the trial in question;
- competition for eligible patients with other companies conducting clinical trials for product candidates seeking to treat the same indication or patient population;
- our payments for conducting clinical trials;
- perceived risks and benefits of the product candidate under study;
- efforts to facilitate timely enrollment in clinical trials;
- patient referral practices of physicians;
- the ability to monitor patients adequately during and after treatment; and
- proximity and availability of clinical trial sites for prospective patients.

Three of our Phase 2b clinical trials of gemcabene commenced in 2016 and we expect a fourth Phase 2 trial of gemcabene will commence in 2017 and may take up to 12 months to enroll; however, we cannot assure you that our timing and enrollment assumptions are correct given the above factors. Our inability to enroll a sufficient number of patients for our clinical trials or retain sufficient enrollment through the completion of our trials would result in significant delays or may require us to abandon one or more clinical trials altogether. Enrollment delays in our clinical trials may result in increased development costs for our product candidates and cause our stock price to decline.

We or others could discover that gemcabene or any product candidate we may pursue in the future lacks sufficient efficacy, or that it causes undesirable side effects that were not previously identified, which could delay or prevent regulatory approval or commercialization.

Because gemcabene has been tested in relatively small patient populations and for limited durations to date, it is possible that our clinical trials have or will indicate an apparent positive effect of gemcabene that is greater than the actual positive effect, if any, or that additional and unforeseen side effects may be observed as its development progresses. The discovery that gemcabene lacks sufficient efficacy, or that it causes undesirable side effects (including side effects not previously identified in our completed clinical trials), could cause us or regulatory authorities to interrupt, delay or discontinue clinical trials and could result in the denial of regulatory approval by the FDA or other non-U.S. regulatory

authorities for any or all targeted indications. The most common events reported to date have been headache, weakness, nausea, dizziness, upset stomach, infection, abnormal bowel movements, myalgia and abnormal kidney function tests.

The discovery that gemcabene or any future product candidate lacks sufficient efficacy or that it causes undesirable side effects that were not previously identified could prevent us from commercializing such product candidate and generating revenues from its sale. In addition, if we receive marketing approval for gemcabene and we or others later discover that it is less effective, or identify undesirable side effects caused by gemcabene:

- regulatory authorities may withdraw their approval of the product;
- we may be required to recall the product, change the way this product is administered, conduct additional clinical trials or change the labeling or distribution of the product (including REMS);
- additional restrictions may be imposed on the marketing of, or the manufacturing processes for, the product;
- we may be subject to fines, injunctions or the imposition of civil or criminal penalties;
- we could be sued and held liable for harm caused to patients;
- the product may be rendered less competitive and sales may decrease; or
- our reputation may suffer generally both among clinicians and patients.

Any one or a combination of these events could prevent us from achieving or maintaining market acceptance of the affected product or could substantially increase the costs and expenses of commercializing the product, which in turn could delay or prevent us from generating significant, or any, revenues from the sale of the product.

If we fail to receive regulatory approval for any of our planned indications for gemcabene or fail to develop additional product candidates, our commercial opportunity will be limited.

We have initially focused on the development of gemcabene for our target indications in cardiovascular diseases and recently expanded our program to include a clinical trial to support an indication for gemcabene in NASH and/or nonalcoholic fatty liver disease (NAFLD). However, we cannot assure you that we will be able to obtain regulatory approval of gemcabene for any indication, or successfully commercialize gemcabene, if approved. If we do not receive regulatory approval for, or successfully commercialize, gemcabene for one or more of our targeted or other indications, our commercial opportunity will be limited.

We may pursue clinical development of additional product candidates, including product candidates that we acquire or in-license. Acquiring, in-licensing, developing, obtaining regulatory approval for and commercializing additional product candidates will require substantial additional funding and are prone to the risks of failure inherent in drug product development. We cannot assure you that we will be able to successfully advance any additional product candidates through the development process.

Even if we obtain FDA approval to market additional product candidates, we cannot assure you that any such product candidates will be successfully commercialized, widely accepted in the marketplace or more effective than other commercially available alternatives. If we are unable to successfully develop and commercialize additional product candidates, our commercial opportunity will be limited.

Changes in regulatory requirements or FDA guidance, or unanticipated events during our clinical trials, may result in changes to clinical trial protocols or additional clinical trial requirements, such as the initiation or completion of a cardiovascular outcomes trial, which could result in increased costs to us and could delay our development timeline.

Changes in regulatory requirements or FDA guidance, or unanticipated events during our clinical trials, may force us to amend clinical trial protocols or the FDA may impose additional clinical trial requirements. Amendments to our clinical trial protocols would require resubmission to the FDA and IRBs for review and approval, and may adversely impact the

cost, timing or successful completion of a clinical trial. If we experience delays completing, or if we terminate, any of our Phase 2 or Phase 3 trials, or if we are required to conduct additional clinical trials, such as a cardiovascular outcomes trial prior to approval, the commercial prospects for gemcabene may be harmed and our ability to generate product revenue will be delayed.

For cardiovascular disease related indications, if the FDA requires us to conduct a cardiovascular outcomes trial sooner than planned, we may not be able to identify and enroll the requisite number of patients in that trial. Even if we are successful in enrolling patients in a cardiovascular outcomes trial, we may not ultimately be able to demonstrate that lowering LDL-C levels using gemcabene provides patients with an incremental lowering of cardiovascular disease risks, and our failure to do so may delay or prejudice our ability to obtain FDA approval for gemcabene. Although the validity of lipid-lowering effects (including LDL-C reduction) as a surrogate endpoint for cardiovascular benefit continues to be debated in the medical community, given historical precedent and recent FDA guidance, our current development timeline for gemcabene does not contemplate the completion of a cardiovascular outcomes trial prior to approval. Such trial would be costly and time-consuming and, regardless of the outcome, would adversely affect our development timeline and financial condition.

For nonalcoholic steatohepatitis (NASH) related indications, the current guidance for approval for a therapy for NASH is based on changes in hepatic biopsy histological scoring and fibrosis staging. Although it is not expected to change over the near term, we cannot predict if the FDA and other global health authorities may change to an endpoint that is more clinically based. If such an endpoint is required, such trial(s) would be costly and time-consuming and, regardless of the outcome, would adversely affect our development timeline and financial condition.

We have not generated any revenue and may never be profitable.

Our ability to become profitable depends upon our ability to generate revenue. To date, we have not generated any revenue from our development stage product candidate, gemcabene, and we do not currently have any other products or product candidates. We do not know when, or if, we will generate any revenue. We do not expect to generate significant revenue unless or until we obtain marketing approval of, and commercialize, gemcabene. Our ability to generate revenue depends on a number of factors, including our ability to:

- successfully complete preclinical carcinogenicity studies to remove the partial clinical hold to allow us to complete longer term registration trials for marketing approval of gemcabene;
- obtain favorable results from and complete the clinical development of gemcabene for our planned indications, including successful completion of our Phase 2 and Phase 3 trials for these indications;
- submit an application to regulatory authorities for gemcabene and receive marketing approval in the United States and foreign countries;
- contract for the manufacture of commercial quantities of gemcabene, if approved, at acceptable cost levels;
- establish sales and marketing capabilities to effectively market and sell gemcabene, if approved, in the United States and the European Union, alone or with a pharmaceutical partner; and
- achieve market acceptance of gemcabene in the medical community and with third-party payors.

Even if gemcabene is approved for commercial sale in one or all of the initial indications that we are pursuing, it may not gain market acceptance or achieve commercial success. In addition, we anticipate incurring significant costs associated with commercializing gemcabene. Moreover, some of the indications we are targeting are small enough to be eligible for orphan drug designation, and our potential patient market is relatively smaller than other drugs, and therefore the price of gemcabene may need to be higher than other drugs. We may not achieve profitability soon after generating product revenue, if ever, and may be unable to continue operations without continued funding.

We depend on intellectual property licensed from Pfizer for gemcabene, and the termination of this license would harm our business.

Pfizer has granted us a worldwide exclusive license to make, use, sell, offer for sale and import the clinical product candidate gemcabene, along with certain intellectual property for the purposes of development and commercialization of gemcabene. We or Pfizer may terminate this license in the event of a material breach that remains uncured for 30 days from the date that the breaching party is provided with notice of such breach, provided that if such breach is capable of being cured, the cure period may be extended up to an additional 60 days, or immediately upon certain insolvency events relating to the other party. Pfizer may immediately terminate this license in the event that we, or any of our affiliates, consent, challenge, support or assist any third party to contest or challenge Pfizer's ownership of or rights in, or the validity, enforceability or scope of, any of the patents licensed under this license. Furthermore, upon termination of the license agreement for cause by Pfizer, we must grant Pfizer a non-exclusive license to use any intellectual property rights arising from the development or commercialization of gemcabene. Additionally, Pfizer may revoke the license if we are unable to adequately commercialize gemcabene by April 2021.

Disputes may arise between us and Pfizer regarding intellectual property subject to this license agreement, including with respect to:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes infringe on intellectual property of Pfizer that is not subject to the licensing agreement;
- the amount and timing of milestone and royalty payments;
- the rights of Pfizer under the license agreement;
- our right to sublicense patent and other rights to third parties under collaborative development relationships; and
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by Pfizer and us and our partners.

Any disputes with Pfizer may prevent or impair our ability to maintain our current licensing arrangement. We depend on the intellectual property and the historical preclinical and clinical data package licensed from Pfizer to develop and commercialize gemcabene. Termination of our license agreement could result in the loss of significant rights and would harm our ability to further develop and commercialize gemcabene. In addition, Pfizer has a non-exclusive, sub licensable, royalty-free right and license for non-commercial research or development purposes to intellectual property rights relating to gemcabene that are developed by us after the effective date of the license with Pfizer.

The development of gemcabene or pursuit of any future product candidate for broad patient populations will be more costly and commercial pricing for any approved indication would likely be lower.

We are initially pursuing development of gemcabene for the treatment of patients with HoFH, HeFH, ASCVD and SHTG. We also plan to pursue development of gemcabene for the treatment of NASH and/or NAFLD. Expanding our development and commercialization of gemcabene or any future product candidate in these or other broader patient populations would be more costly and take longer to complete and would be subject to development and commercialization risks that may not be applicable to HoFH orphan indication.

Specifically, this may involve clinical trials with larger numbers of patients possibly taking the drug for longer periods of time. In addition, we believe that the FDA and, in some cases, the European Medicines Agency (EMA) may require a clinical outcomes trial demonstrating a reduction in cardiovascular events either prior to or after the submission of an application for marketing approval for the broader LDL-C indications. Clinical outcomes trials are particularly expensive and time consuming to conduct because of the larger number of patients required to establish that the drug being tested has the desired effect. It may also be more difficult for us to demonstrate the desired outcomes in these trials than to achieve validated surrogate endpoints. In addition, in considering approval of gemcabene for broader patient populations

with less severely elevated lipid levels, the FDA and other regulatory authorities may place greater emphasis on the side effect and risk profile of the drug in comparison to the drug's efficacy and potential clinical benefit than in smaller, more severely afflicted patient populations. These factors may make it more difficult for us to achieve marketing approvals of gemcabene for these broader patient populations.

Moreover, if we pursue and are able to successfully develop and obtain marketing approval of gemcabene and any future product candidate in broader patient populations, we likely will not be able to obtain the same pricing level that we expect to obtain for orphan indications. The pricing of some drugs intended for orphan populations is often related to the size of the patient population, with smaller patient populations often justifying higher prices. If the pricing is lower in broader patient populations, we may not be able to maintain higher pricing in the population of more severely afflicted patients. This would lead to a decrease in revenue from sales to more severely afflicted patients and could make it more difficult for us to achieve or maintain profitability.

We do not have drug research or discovery capabilities and will need to acquire or license product candidates from third parties to expand our product candidate pipeline.

We currently have no drug research or discovery capabilities. Accordingly, if we are to expand our product candidate pipeline beyond gemcabene, we will need to acquire or license product candidates from third parties. We will face significant competition in seeking to acquire or license promising product candidates. Many of our competitors for such promising product candidates may have significantly greater financial resources and more extensive experience in preclinical testing and clinical trials, obtaining regulatory approvals and manufacturing and marketing pharmaceutical products, and thus, may be a more attractive option to a potential licensor than us. If we are unable to acquire or license additional promising product candidates, we will not be able to expand our product candidate pipeline.

If we are able to acquire or license other product candidates, such license agreements will likely impose various obligations upon us, and our licensors may have the right to terminate the license thereunder in the event of a material breach or, in some cases, at will. A termination of future licenses could result in our loss of the right to use the licensed intellectual property, which could adversely affect our ability to develop and commercialize a future product candidate, if approved, as well as harm our competitive business position and our business prospects.

We may expend our limited resources to pursue a particular indication and fail to capitalize on indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we are currently focusing only on development programs that we identify for specific indications for gemcabene. As a result, we may forego or delay pursuit of opportunities for other indications, or with other potential product candidates that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs for specific indications or future product candidates may not yield any commercially viable product. If we do not accurately evaluate the commercial potential or target market for gemcabene, we may not gain approval or achieve market acceptance of that candidate, and our business and financial results will be harmed.

Risks Related to Our Financial Position and Need for Additional Capital

We have incurred only losses since inception. We expect to incur losses for the foreseeable future and may never achieve or maintain profitability.

Since inception, we have incurred only operating losses. Our net losses were \$14.6 million, \$9.0 million and \$0.3 million for the years ended December 31, 2016, 2015 and 2014, respectively. As of December 31, 2016, we had an accumulated deficit of \$27.1 million. We have financed our operations primarily through the issuance of common stock in our initial public offering (IPO), a private placement of our preferred stock and the issuance of convertible debt securities. We have devoted substantially all of our financial resources and efforts on research and development, including clinical development of gemcabene. We expect that it will be a number of years, if ever, before we have a product candidate ready for commercialization. We expect to continue to incur significant expenses and increased operating losses for the foreseeable future.

To become and remain profitable, we must develop and eventually commercialize a product with market potential. This will require us to be successful in a range of challenging activities, including completing preclinical testing and clinical trials, obtaining regulatory approval for a product candidate, manufacturing, marketing and selling any drug for which we may obtain regulatory approval and satisfying any post-marketing requirements. We are in the early stages of most of these activities. We may never succeed in these activities and, even if we do, we may never generate revenues that are significant or large enough to achieve profitability.

If we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable would decrease the value of the company and could impair our ability to raise capital, maintain our research and development efforts, expand our business or continue our operations. A decline in the value of our company could also cause you to lose all or part of your investment.

We will need substantial additional capital in the future. If additional capital is not available, we will have to delay, reduce or cease operations.

Although we believe that cash on hand will be sufficient to fund our operations into at least late 2018, we will need to raise additional capital to continue to fund the further development of gemcabene and our operations. Our future capital requirements may be substantial and will depend on many factors including:

- the scope, size, rate of progress, results and costs of researching and developing gemcabene and initiating and completing our preclinical studies and clinical trials;
- the cost, timing and outcome of our efforts to obtain marketing approval for gemcabene in the United States and other countries, including to fund the preparation and filing of an NDA with the FDA for gemcabene and to satisfy related FDA requirements and regulatory requirements in other countries;
- the number and characteristics of any additional product candidates we develop or acquire, if any;
- our ability to establish and maintain collaborations on favorable terms, if at all;
- the timing and amount of milestone and royalty payments;
- the amount of revenue, if any, from commercial sales, should any product candidate receive marketing approval;
- the costs associated with commercializing gemcabene or any future product candidates, if we receive marketing approval, including the cost and timing of developing sales and marketing capabilities or entering into strategic collaborations to market and sell gemcabene or any future product candidates;
- the cost of manufacturing gemcabene or any future product candidates and any product we successfully commercialize; and
- the costs associated with general corporate activities, such as the cost of filing, prosecuting and enforcing patent claims and making regulatory filings.

Changing circumstances may cause us to consume capital significantly faster than we currently anticipate. Because the outcome of any clinical trial is highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development, regulatory approval and commercialization of gemcabene and any future product candidates. Additional financing may not be available when we need it or may not be available on terms that are favorable to us. In addition, we may seek additional capital due to favorable market conditions or strategic considerations, even if we believe we have sufficient funds for our current or future operating plans. If adequate funds are unavailable to us on a timely basis, or at all, we may not be able to continue the development of gemcabene or any future product candidate, or commercialize gemcabene or any future product candidate, if approved, unless we find a strategic partner.

Raising additional capital may cause dilution to our stockholders and restrict our operations or require us to relinquish rights to our technologies or product candidates.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of equity and debt financings as well as potential strategic collaborations and licensing arrangements. We do not have any committed external source of funds.

To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing or preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If we raise funds through strategic collaborations or marketing, distribution, or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves. This may reduce the value of our common stock.

In the past, we issued options to acquire common stock at prices significantly below the initial public offering price. Pursuant to our A&R 2015 Plan, our management is authorized to grant stock options to our employees, directors and consultants. The aggregate number of shares of our common stock remaining available for issuance under the A&R 2015 Plan is 2,355,200 shares at December 31, 2016. The number of shares of our common stock reserved for issuance under the A&R 2015 Plan will automatically increase on January 1 of each year, continuing through and including January 1, 2026, to an amount equal to 20% of the fully-diluted shares as of December 31 of the preceding calendar year, or a lesser number of shares determined by our board of directors.

In September 2016 our board of directors approved the Inducement Plan. We initially reserved 300,000 shares of common stock to be used exclusively for grants of awards to individuals who were not previously our employees or directors, as an inducement material to the individual's entry into employment with us within the meaning of Rule 5635(c)(4) of the NASDAQ Listing Rules. The Inducement Plan was approved by our board of directors without stockholder approval pursuant to Rule 5635(c)(4), and the terms and conditions of the Inducement Plan are substantially similar to our stockholder-approved A&R 2015 Plan. At December 31, 2016, 102,000 shares remained available for issuance under the Inducement Plan.

To the extent these outstanding options are ultimately exercised or the number of shares available for future grant under our equity incentive plans each year are increased, investors will sustain further dilution.

Risks Related to Government Regulation

Gemcabene is subject to a partial clinical hold with respect to clinical trials of longer than six months in duration until ongoing preclinical toxicology studies are complete, which may lead to a significant delay in the commencement of long term clinical trials by us or the failure of gemcabene to obtain marketing approval.

In 2004, the FDA determined that gemcabene was a potential peroxisome proliferator-activated receptor (PPAR) agonist. As a result, the FDA imposed a partial clinical hold, which restricts us from conducting clinical trials for gemcabene beyond six months in duration, and requires us to conduct two-year rat and mouse carcinogenicity studies before conducting trials of longer than six months. The FDA has issued these notices to all sponsors of product candidates with PPAR properties based on preclinical studies. We plan to complete our two-year rat and mouse carcinogenicity studies by the end of 2017, with draft reports issued soon after. Clinical trials may be delayed due to these clinical restrictions and additional oversight by the FDA. For example, if the results of the two-year rat and mouse carcinogenicity studies do not address FDA concerns related to the partial clinical hold, our Phase 3 long term safety exposure registration trials of longer than six months could be delayed. Also, the findings in the carcinogenicity studies could impact the NDA review, and, if approved, labeling and use of gemcabene.

Even if we receive marketing approval for gemcabene or any product candidate we may pursue in the future in the United States, we may never receive regulatory approval to market such product candidate outside of the United States.

In addition to the United States, we intend to seek regulatory approval to market gemcabene in Canada and Europe and potentially other markets. If we pursue additional product candidates in the future, we may seek regulatory approval of such product candidates outside the United States. In order to market any product outside of the United States, however, we must establish and comply with the numerous and varying safety, efficacy and other regulatory requirements of these other countries. Approval procedures vary among countries and can involve additional product candidate testing and additional administrative review periods. The time required to obtain approvals in other countries might differ from that required to obtain FDA approval. The marketing approval processes in other countries may include all of the risks detailed above regarding FDA approval in the United States as well as other risks. In particular, in many countries outside of the United States, products must receive pricing and reimbursement approval before the product can be commercialized. Obtaining this approval can result in substantial delays in bringing products to market in such countries. Marketing approval in one country does not ensure marketing approval in another, but a failure or delay in obtaining marketing approval in one country may have a negative effect on the regulatory process in others. Failure to obtain marketing approval in other countries or any delay or other setback in obtaining such approval would impair our ability to market gemcabene or any future product candidate in such foreign markets. Any such impairment would reduce the size of our potential market, which could have an adverse impact on our business, results of operations and prospects.

Even if we obtain marketing approval for gemcabene or any product candidate we may pursue in the future, such product candidate could be subject to post-marketing restrictions or withdrawal from the market, and we may be subject to substantial penalties if we fail to comply with regulatory requirements or experience unanticipated problems with a product candidate following approval.

Any product candidate for which we, or our future collaborators, obtain marketing approval in the future, as well as the manufacturing processes, post-approval studies and measures, labeling, advertising and promotional activities for such drug, among other things, will be subject to continual requirements of and review by the FDA and other regulatory authorities. These requirements include submissions of safety and other post-marketing information and reports, registration and listing requirements, requirements relating to manufacturing, quality control, quality assurance and corresponding maintenance of records and documents, requirements regarding the distribution of samples to physicians and recordkeeping. Even if marketing approval of a product candidate is granted, the approval may be subject to limitations on the indicated uses for which the drug may be marketed or to the conditions of approval, including the requirement to implement a REMS, which could include requirements for a restricted distribution system.

The FDA may also impose requirements for costly post-marketing studies or clinical trials and surveillance to monitor the safety or efficacy of a product candidate. The FDA and other agencies, including the Department of Justice, closely regulate and monitor the post-approval marketing and promotion of drugs to ensure that they are manufactured, marketed and distributed only for the approved indications and in accordance with the provisions of the approved labeling. The FDA imposes stringent restrictions on manufacturers' communications regarding off-label use and if we, or our future collaborators, do not market a product candidate for which we, or they, receive marketing approval for only their approved indications, we, or they, may be subject to warnings or enforcement action for off-label promotion. Violation of the Federal Food, Drug, and Cosmetic Act (FDCA) and other statutes, including the False Claims Act, relating to the promotion and advertising of prescription drugs may lead to investigations or allegations of violations of federal and state health care fraud and abuse laws and state consumer protection laws.

In addition, later discovery of previously unknown AEs or other problems with our product candidate or its manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may yield various results, including:

- litigation involving patients taking our drug;
- restrictions on such drugs, manufacturers or manufacturing processes;
- restrictions on the labeling or marketing of a drug;
- restrictions on drug distribution or use;

- requirements to conduct post-marketing studies or clinical trials;
- warning letters or untitled letters;
- withdrawal of the drugs from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- product recall or public notification or medical product safety alerts to healthcare professionals;
- fines, restitution or disgorgement of profits or revenues;
- suspension or withdrawal of marketing approvals;
- damage to relationships with any potential collaborators;
- unfavorable press coverage and damage to our reputation;
- refusal to permit the import or export of drugs;
- product seizure; or
- injunctions or the imposition of civil or criminal penalties.

We may seek to avail ourselves of mechanisms to expedite the development or approval of gemcabene or any other product candidate we may pursue in the future, such as fast track designation, but such mechanisms may not actually lead to a faster development or regulatory review or approval process.

We may seek fast track designation, priority review, or accelerated approval for gemcabene or any other product candidate we may pursue in the future. For example, if a drug is intended for the treatment of a serious or life-threatening condition and the drug demonstrates the potential to address unmet medical needs for this condition, the drug sponsor may apply for FDA fast track designation. However, the FDA has broad discretion with regard to these mechanisms, and even if we believe a particular product candidate is eligible for any such mechanism, we cannot assure you that the FDA would decide to grant it. Even if we do obtain fast track or priority review designation or pursue an accelerated approval pathway, we may not experience a faster development process, review or approval compared to conventional FDA procedures. The FDA may withdraw a particular designation if it believes that the designation is no longer supported by data from our clinical development program.

A breakthrough therapy designation by the FDA for a product candidate may not lead to a faster development or regulatory review or approval process, and it may not increase the likelihood that a product candidate will receive marketing approval.

Depending on the results of our clinical trials, we may seek a breakthrough therapy designation for gemcabene or any other product candidate we may pursue in the future. A breakthrough therapy is defined as a drug that is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints. For drugs that are designated as breakthrough therapies, interaction and communication between the FDA and the sponsor can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens.

Designation as a breakthrough therapy is within the discretion of the FDA. Accordingly, even if we believe a product candidate meets the criteria for designation as a breakthrough therapy, the FDA may disagree and instead determine not to make such designation. We cannot be sure that our evaluation of a product candidate as qualifying for breakthrough therapy designation will meet the FDA's requirements. In any event, the receipt of a breakthrough therapy designation for a product candidate may not result in a faster development process, review or approval compared to conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, even if one or more product candidate

qualifies as a breakthrough therapy, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

Recently-enacted and future legislation may increase the difficulty and cost for us and our future collaborators to obtain marketing approval of our product candidate and affect its pricing.

In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of a product candidate, restrict or regulate post-approval activities and affect our ability, or the ability of our future collaborators, to profitably sell any drug for which we, or they, obtain marketing approval. We expect that current laws, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and cause downward pressure on the price that we, or our future collaborators, may receive for any approved drug.

For example, in March 2010, President Obama signed into law the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act (collectively, the PPACA). This is a sweeping law intended to broaden access to health insurance, reduce or constrain the growth of healthcare spending, improve healthcare quality, enhance remedies against fraud and abuse, add new transparency requirements for certain components of the health care and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms. Among the provisions of the PPACA of importance to gemcabene and any future product candidates are:

- an annual, nondeductible fee on any entity that manufactures or imports specified branded prescription drugs and biologic agents, apportioned among these entities according to their market share in certain government healthcare programs;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program to 23.1% and 13.0% of the average manufacturer price for branded and generic drugs, respectively;
- a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected;
- extension of a manufacturer's Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to certain individuals with income at or below 133% of the federal poverty level, thereby potentially increasing a manufacturer's Medicaid rebate liability;
- a Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for a manufacturer's outpatient drugs to be covered under Medicare Part D;
- expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program; and
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research.

There have been judicial and Congressional challenges and amendments to certain aspects of the PPACA, and we expect there will be additional challenges and amendments to, and attempts to repeal, the PPACA in the future. In addition, other legislative changes have been proposed and adopted since the PPACA was enacted. These new laws have resulted in additional reductions in Medicare and other healthcare funding and otherwise may affect the prices we may obtain for any product candidate for which marketing approval is obtained. Any reduction in reimbursement from Medicare or other government-funded programs may result in a similar reduction in payments from private payors. Moreover,

recently there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our drugs.

Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We cannot be sure whether additional legislative changes will be enacted, or whether the FDA regulations, guidance or interpretations will be changed, or what the impact of such changes on the marketing approvals of a product candidate, if any, may be. In addition, increased scrutiny by the U.S. Congress of the FDA's approval process may significantly delay or prevent marketing approval, as well as subject us and our future collaborators to more stringent drug labeling and post-marketing testing and other requirements.

Governments outside of the United States tend to impose strict price controls, which may adversely affect our revenues from the sales of a drug, if any.

In some countries, particularly the countries of the European Union, the pricing of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a drug. To obtain reimbursement or pricing approval in some countries, we, or our future collaborators, may be required to conduct a clinical trial that compares the cost-effectiveness of our drug to other available therapies. If reimbursement of our drug is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business could be harmed.

Our relationships with healthcare providers and third-party payors will be subject to applicable fraud and abuse and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm and diminished profits and future earnings, among other penalties and consequences.

Healthcare providers and third-party payors will play a primary role in the recommendation and prescription of any product candidate for which we obtain marketing approval. Our current and future arrangements with third-party payors and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we market, sell and distribute any product candidate for which we obtain marketing approval. Restrictions and obligations under applicable federal and state healthcare laws and regulations include the following:

- the federal Anti-Kickback Statute prohibits, among other things, persons and entities from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under a federal healthcare program such as Medicare and Medicaid;
- the federal false claims and civil monetary penalties laws, including the civil False Claims Act imposes criminal and civil penalties, including civil whistleblower or qui tam actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government;
- the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA) imposes criminal and civil liability for, among other things, executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, and its implementing regulations, also imposes obligations, including mandatory contractual terms, on certain people and entities with respect to safeguarding the privacy, security and transmission of individually identifiable health information;
- the federal Physician Payments Sunshine Act under the PPACA requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid, or the Children's Health Insurance Program, with specific exceptions, to report annually to the Centers for Medicare & Medicaid Services within the U.S. Department of Health and Human Services information

related to physician payments and other transfers of value and physician ownership and investment interests; and

- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, and some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug manufacturers to report information related to payments to physicians and other health care providers or marketing expenditures. Certain state and foreign laws also govern the privacy and security of health information in ways that differ from each other and often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our current and future business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, exclusion from government funded healthcare programs, such as Medicare and Medicaid, disgorgement, individual imprisonment, contractual damages, reputational harm, diminished profits and future earnings, and the curtailment or restructuring of our operations. If any of the physicians or other providers or entities with whom we expect to do business is found to not be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs. Defending against any such actions can be costly, time-consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

We are subject to U.S. and certain foreign export and import controls, sanctions, embargoes, anti-corruption laws, and anti-money laundering laws and regulations. Compliance with these legal standards could impair our ability to compete in domestic and international markets. We can face criminal liability and other serious consequences for violations which can harm our business.

We are subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. Customs regulations, various economic and trade sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls, the U.S. Foreign Corrupt Practices Act of 1977, as amended, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, and other state and national anti-bribery and anti-money laundering laws in the countries in which we conduct activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees, agents, contractors, and other partners from authorizing, promising, offering, or providing, directly or indirectly, improper payments or anything else of value to recipients in the public or private sector. We may engage third parties for clinical trials outside of the United States, to sell our products abroad once we enter a commercialization phase, and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We can be held liable for the corrupt or other illegal activities of our employees, agents, contractors, and other partners, even if we do not explicitly authorize or have actual knowledge of such activities. Our violations of the laws and regulations described above may result in substantial civil and criminal fines and penalties, imprisonment, the loss of export or import privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences.

Our employees may engage in misconduct or other improper activities, including violating applicable regulatory standards and requirements or engaging in insider trading, which could significantly harm our business.

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include intentional failures to comply with the regulations of the FDA and applicable non-U.S. regulators, provide accurate information to the FDA and applicable non-U.S. regulators, comply with healthcare fraud and abuse laws and regulations in the United States and abroad, report financial information or data accurately or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations

intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws and regulations restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee misconduct could also involve the improper use of, including trading on, information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may be ineffective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of significant civil, criminal and administrative penalties, damages, fines, exclusion from government funded healthcare programs such as Medicare and Medicaid, disgorgement, individual imprisonment, contractual damages, reputational harm, diminished profits and future earnings, and the curtailment or restructuring of our operations.

The FDA and other regulatory agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses. If we are found to have improperly promoted off-label uses, we may become subject to significant liability.

The FDA and other regulatory agencies strictly regulate the promotional claims that may be made about prescription products, such as gemcabene, if approved. In particular, a product may not be promoted for uses that are not approved by the FDA or such other regulatory agencies as reflected in the product's approved labeling. If we receive marketing approval for gemcabene or any future product candidate for a certain indication, physicians may nevertheless prescribe gemcabene or such future product candidate to their patients in a manner that is inconsistent with the approved label. If we are found to have promoted such off-label uses, we may become subject to significant liability. The federal government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The FDA has also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed. If we cannot successfully manage the promotion of gemcabene or any future product candidate, if approved, we could become subject to significant liability, which would adversely affect our business and financial condition.

Risks Related to the Commercialization of Gemcabene or Any Future Product Candidate

We face substantial competition, which may result in others discovering, developing or commercializing products before or more successfully than we do.

The development and commercialization of new drug products is highly competitive. We expect to face competition with respect to gemcabene, if approved, and will face competition with respect to any product candidates that we may seek to develop or commercialize in the future from major pharmaceutical companies, specialty pharmaceutical companies, biotechnology companies, universities and other research institutions and government agencies worldwide.

The lipid-lowering therapies market is highly competitive and dynamic and dominated by the sale of statin treatments including the cheaper generic versions of statins. Our success will depend, in part, on our ability to obtain a share of the market for our planned indications. Other pharmaceutical companies may develop lipid-lowering therapies for the same indications that compete with gemcabene, if approved, that do not infringe the claims of our patents, pending patent applications or other proprietary rights which could adversely affect our business and results of operations. Lipid-lowering therapies currently on the market that would compete with gemcabene, if approved, include the following:

- statins, such as Crestor marketed by AstraZeneca, Livalo marketed by Kowa Pharmaceuticals America, Inc. (Kowa), Zocor marketed by Merck & Co., Inc. (Merck), Lipitor marketed by Pfizer, and their generic versions;
- cholesterol absorption inhibitors, such as Zetia, marketed by Merck;
- apoB antisense Kynamro marketed by Genzyme Corporation, a Sanofi company, and MTTP inhibitor Juxtapid marketed by Aegerion Pharmaceuticals, Inc.;
- combination therapies, such as Vytorin and Liptruzet, both marketed by Merck;

- other lipid-lowering monotherapies, including: fibrates, such as TriCor and Trilipix, both marketed by AbbVie Inc. (AbbVie), and Lipofen marketed by Kowa; niacin, such as Niaspan marketed by AbbVie; bile acid sequestrants, such as Welchol, marketed by Daiichi Sankyo Inc.; combination therapies, such as Advicor and Simcor, both of which are marketed by AbbVie; and their generic version of these drugs;
- prescription fish oils, such as Lovaza marketed by GlaxoSmithKline, Epanova marketed by AstraZeneca and Vascepa marketed by Amarin Corporation plc; and
- PCSK9 inhibitors, such as Praluent, developed by Sanofi-Aventis U.S. LLC, and Regeneron Pharmaceuticals, Inc. and Repatha marketed by Amgen Inc.
- Several other pharmaceutical companies have other lipid-lowering therapies in development that may be approved for marketing in the United States or outside of the United States. Based on publicly available information, we believe the current therapies in development that would compete with gemcabene include:
 - for HoFH, RGEN-1500 being developed by Regeneron Pharmaceuticals, Inc. MGL-3196 developed by Madrigal Pharmaceuticals (Madrigal) for HoFH, and ALN-PCSSc being developed by The Medicines Company and Alnylam Pharmaceuticals, Inc.;
 - for HeFH and ASCVD, drugs include: oral cholesteryl ester transfer protein inhibitors, such as anacetrapib being developed by Merck and TA-8995 being developed by Amgen/Dezima; ATP citrate lyase inhibitor, ETC-1002 developed by current Esperion; PCSK9 inhibitors, such as ALN-PCSSc being developed by The Medicines Company and Alnylam Pharmaceuticals, Inc., and MGL-3196 developed by Madrigal (HeFH only);
 - for SHTG, ISIS-APOCIII-LRX being developed by Ionis Pharmaceuticals, Inc. (formerly Isis Pharmaceuticals, Inc.); and

This means that there is significant competition for investigational sites and patients to enroll in clinical studies. Additionally, since some drug candidates may be further along in development, approval of such drug candidates could lead to the FDA and other global health authorities to request and/or require changes to ongoing or future clinical trial designs that could impact timelines and cost.

The biomarkers and pathogenesis of NASH are less understood than the dyslipidemia market and for that reason there are many mechanisms of action under investigation to better understand how to effectively treat the disease. Currently accepted diagnosis of the NASH is confirmed through liver biopsy which is invasive, time consuming and costly. Future growth and evolution of the NASH market may rely on development of less invasive technologies to increase diagnoses rates to broaden the drug treated patient population. Several companies have late stage assets (Phase 3 or outcomes studies) well under way with projected market approval dates in NASH as soon as 2019/2020. For NASH, the market is currently evolving with no approved therapies for the indication across the globe. Current thought leader opinions are pointing to a multiple mechanistic approach to effectively treat NASH.

Several pharmaceutical companies have NASH therapies in development that may be approved for marketing in the United States or outside of the United States. Based on publicly available information, we believe the current therapies in development that would compete with gemcabene in NASH include but are not limited to:

- OCALIVA (Obeticholic Acid) (FXR Agonist) being developed by Intercept Pharmaceuticals, Inc.;
- Elafibranor (PPAR Agonist) being developed by Genfit SA;
- Selonsertib (formerly GS-4997) (ASK1 Inhibitor) being developed by Gilead Sciences, Inc.;
- GS-0976 (ACC Inhibitor) being developed by Gilead Sciences, Inc.;
- Cenicriviroc (CVC) (CCR2/CCR5 Inhibitor) being developed by Tobira Therapeutics, Inc. (a wholly-owned subsidiary of Allergan plc);
- Emricasan (Caspase Inhibitor) being developed by Conatus Pharmaceuticals Inc.
- Aramchol (Synthetic Fatty Acid/Bile Acid Conjugate) being developed by Galmed;
- GR-MD-02 (Galectin-3 Inhibitor) being developed by Galectin Therapeutics; and
- MGL-3196 (THR Agonist) being developed by Madrigal.

Our competitors may develop products that are more effective, safer, more convenient or less costly than any that we are developing or that would render our product candidates obsolete or non-competitive. Our competitors may also render our technologies obsolete by advances in existing technological approaches or the development of new or different approaches, potentially eliminating the advantages in our drug discovery process. Our competitors may also obtain marketing approval from the FDA or other regulatory authorities for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market.

Many of our competitors have significantly greater name recognition, financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller and other early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These third parties compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient registration for clinical trials and entering into strategic transactions, as well as in acquiring technologies complementary to, or necessary for, our programs.

We lack experience commercializing products, which may have an adverse effect on our business.

If gemcabene or any product candidate we may pursue in the future receives marketing approval, we will need to transition from a company with a development focus to a company capable of supporting commercial activities, and we may not be successful in making that transition. We have never filed an NDA, and have not yet demonstrated an ability to obtain marketing approval for, or to commercialize, any product candidate. As a result, our clinical development and regulatory approval process, and our ability to successfully commercialize any approved products, may involve more inherent risk, take longer, and cost more than it would if we were a company with experience obtaining marketing approval for and commercializing a product candidate.

If we are unable to establish sales and marketing capabilities or enter into agreements with third parties to sell and market gemcabene, if approved, or any other product candidate we may pursue, we may not be successful in commercializing such product candidate if and when approved.

We do not have a global sales or marketing infrastructure and have no capabilities in place at the present time for the sale, marketing or distribution of pharmaceutical products. To achieve commercial success for any approved product for which we retain sales and marketing responsibilities, we must either develop a sales and marketing organization or outsource part or all of these functions to other third parties.

There are risks involved with both establishing our own sales and marketing capabilities and entering into arrangements with third parties to perform these services. For example, recruiting and training a sales force is expensive and time consuming and could delay any product launch. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we cannot retain or reposition our sales and marketing personnel.

Factors that may inhibit our efforts to commercialize gemcabene or any future product candidate on our own include:

- our inability to recruit and retain adequate numbers of effective sales and marketing personnel;
- the inability of sales personnel to obtain access to physicians or persuade adequate numbers of physicians to prescribe our product candidate;
- the lack of complementary products to be offered by sales personnel, which may put us at a competitive disadvantage relative to companies with more extensive product lines;
- unforeseen costs and expenses associated with creating an independent sales and marketing organization; and

- inability to obtain sufficient coverage and reimbursement from third-party payors and governmental agencies.

If we enter into arrangements with third parties to perform sales, marketing and distribution services, our product revenues or the profitability of these product revenues to us are likely to be lower than if we were to market and sell a product that we develop ourselves. In addition, we may not be successful in entering into arrangements with third parties to sell and market any product candidate or may be unable to do so on terms that are favorable to us. We likely will have little control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market a drug effectively. If we do not establish sales and marketing capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing gemcabene or any future product candidate.

Even if gemcabene or any future product candidate receives marketing approval, it may fail to achieve the degree of market acceptance by physicians, patients, healthcare payors and others in the medical community necessary for commercial success.

Even if gemcabene or any future product candidate receives marketing approval, it may nonetheless fail to gain sufficient market acceptance by physicians, patients, healthcare payors and others in the medical community. If such product candidate does not achieve an adequate level of acceptance, we may not generate significant product revenues and we may not become profitable. The degree of market acceptance of a product candidate, if approved for commercial sale, will depend on a number of factors, including:

- efficacy and potential advantages compared to alternative treatments;
- the ability to offer our product for sale at competitive prices;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- any restrictions on the use of our product together with other medications;
- interactions of our product with other medicines patients are taking;
- inability of certain types of patients to take our product;
- demonstrated ability to treat patients and, if required by any applicable regulatory authority in connection with the approval for target indications, to provide patients with incremental cardiovascular disease benefits, as compared with other available therapies;
- the relative convenience and ease of administration of gemcabene, including as compared with other treatments available for approved indications;
- the prevalence and severity of any adverse side effects;
- limitations or warnings contained in the labeling approved by the FDA;
- availability of alternative treatments already approved or expected to be commercially launched in the near future;
- the effectiveness of our sales and marketing strategies;
- our ability to increase awareness through marketing efforts;
- guidelines and recommendations of organizations involved in research, treatment and prevention of various diseases that may advocate for alternative therapies;

- our ability to obtain sufficient third-party coverage and adequate reimbursement;
- the willingness of patients to pay out-of-pocket in the absence of third-party coverage; and
- physicians or patients may be reluctant to switch from existing therapies even if potentially more effective, safe or convenient.

If the FDA or a comparable foreign regulatory authority approves generic versions of gemcabene or any future product candidates that receive marketing approval, or such authorities do not grant our product candidates appropriate periods of data exclusivity before approving generic versions of our products, the sales of our products could be adversely affected.

Once an NDA is approved, the product covered thereby becomes a “reference listed drug” in the FDA’s publication, “Approved Drug Products with Therapeutic Equivalence Evaluations.” Manufacturers may seek approval of generic versions of reference listed drugs through submission of abbreviated new drug applications (ANDAs) in the United States. In support of an ANDA, a generic manufacturer need not conduct clinical studies. Rather, the applicant generally must show that its product has the same active ingredient(s), dosage form, strength, route of administration and conditions of use or labeling as the reference listed drug and that the generic version is bioequivalent to the reference listed drug, meaning it is absorbed in the body at the same rate and to the same extent. Generic products may be significantly less costly to bring to market than the reference listed drug and companies that produce generic products are generally able to offer them at lower prices. Thus, following the introduction of a generic drug, a significant percentage of the sales of any branded product or reference listed drug may be typically lost to the generic product.

The FDA may not approve an ANDA for a generic product until any applicable period of non-patent exclusivity for the reference listed drug has expired. The FDC Act provides a period of five years of non-patent exclusivity for a new drug containing a new chemical entity (NCE). Specifically, in cases where such exclusivity has been granted, an ANDA may not be filed with the FDA until the expiration of five years unless the submission is accompanied by a Paragraph IV certification that a patent covering the reference listed drug is either invalid or will not be infringed by the generic product, in which case the applicant may submit its application four years following approval of the reference listed drug. It is unclear whether the FDA will treat the active ingredients in our product candidates as NCEs and, therefore, afford them five years of NCE data exclusivity if they are approved. If any product we develop does not receive five years of NCE exclusivity, it may nonetheless be eligible for three years of exclusivity, which means that the FDA may approve generic versions of such product three years after its date of approval. Manufacturers may seek to launch these generic products following the expiration of the applicable marketing exclusivity period, even if we still have patent protection for our product.

Competition that gemcabene or any future product candidates may face from generic versions of our products could materially and adversely impact our future revenue, profitability and cash flows and substantially limit our ability to obtain a return on the investments we have made in any such product candidate.

Even if we are able to commercialize gemcabene or any future product candidate, the profitability of such product candidate will likely depend in significant part on third-party reimbursement practices, which, if unfavorable, would harm our business.

Our ability to commercialize a drug successfully will depend in part on the extent to which coverage and adequate reimbursement will be available from government health administration authorities, private health insurers and other organizations. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will pay for and establish reimbursement levels. Government authorities and third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. We cannot be sure that coverage will be available for any product candidate that we commercialize and, if coverage is available, whether the level of reimbursement will be adequate. Assuming we obtain coverage for gemcabene, if approved, by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. Patients who are prescribed medications for the treatment of their conditions, and their prescribing physicians, generally rely on third-party payors to reimburse all or part of the costs associated with their prescription drugs. Patients are unlikely to use a product candidate, if approved, unless coverage is provided and reimbursement is

adequate to cover all or a significant portion of the cost of our products. Therefore, coverage and adequate reimbursement is critical to new product acceptance. If reimbursement is not available or is available only to limited levels, we may not be able to successfully commercialize any product candidate for which we obtain marketing approval.

There may be significant delays in obtaining reimbursement for newly approved drugs, and coverage may be more limited than the purposes for which a product candidate is approved by the FDA or similar regulatory authorities outside the United States. Moreover, eligibility for reimbursement does not imply that any product will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution. Interim reimbursement levels for a new product, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Reimbursement rates may vary according to the use of the product and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost medicines and may be incorporated into existing payments for other services. Net prices for products may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of medicines from countries where they may be sold at lower prices than in the United States. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies. However, no uniform policy requirement for coverage and reimbursement for drug products exists among third-party payors in the United States. Therefore, coverage and reimbursement for drug products can differ significantly from payor to payor. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance.

Our inability to promptly obtain coverage and profitable payment rates from both government-funded and private payors for any approved products that we develop could have an adverse effect on our operating results, our ability to raise capital needed to commercialize products and our overall financial condition.

Product liability lawsuits against us could cause us to incur substantial liabilities and could limit commercialization of any product candidate that we may develop.

We face an inherent risk of product liability exposure related to the testing of our product candidate in human clinical trials and will face an even greater risk if we commercially sell any products that we may develop. Product liability claims might be brought against us by patients, healthcare providers or others selling or otherwise coming into contact with gemcabene or any future product candidate during product testing, manufacturing, marketing or sale. For example, we may be sued on allegations that a product candidate caused injury or that the product is otherwise unsuitable. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, including as a result of interactions with alcohol or other drugs, negligence, strict liability, and a breach of warranties. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against claims that our product candidate caused injuries, we could incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any product candidate that we are developing;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- increased FDA warnings on product labels;
- significant costs to defend the related litigation;
- substantial monetary awards to trial participants or patients;
- distraction of management's attention from our primary business;
- loss of revenue; and

- the inability to commercialize any product candidate that we may develop.

Any product liability or clinical trial insurance coverage that we do obtain may not be adequate to cover all liabilities that we may incur. We may need to increase our insurance coverage as we expand clinical trials and if we successfully commercialize gemcabene or any other product candidate we may pursue in the future. Insurance coverage is increasingly expensive, and we may not be able to obtain product liability insurance on commercially reasonable terms or in an amount adequate to satisfy any liability that may arise.

If we or our third-party manufacturers fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have an adverse effect on the success of our business.

Our research and development activities involve the controlled use of potentially hazardous substances, including chemical and biological materials, by ourselves and our third-party manufacturers. Our manufacturers are subject to federal, state and local laws and regulations in the United States and abroad governing laboratory procedures and the use, manufacture, storage, handling and disposal of medical and hazardous materials. Although we believe that our manufacturers' procedures for using, handling, storing and disposing of these materials comply with legally prescribed standards, we cannot completely eliminate the risk of contamination or injury resulting from medical or hazardous materials. As a result of any such contamination or injury, we may incur liability or local, city, state or federal authorities may curtail the use of these materials and interrupt our business operations. In the event of an accident, we could be held liable for damages or penalized with fines, and the liability could exceed our resources. We do not have any insurance for liabilities arising from medical or hazardous materials. Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. Compliance with applicable environmental, health and safety laws and regulations is expensive, and current or future environmental regulations may impair our research, development and production efforts, which could harm our business, prospects, financial condition or results of operations.

Federal legislation and actions by state and local governments may permit reimportation of drugs from foreign countries into the United States, including foreign countries where the drugs are sold at lower prices than in the United States, which could adversely affect our operating results.

We may face competition for gemcabene, if approved, from cheaper lipid-lowering therapies sourced from foreign countries that have placed price controls on pharmaceutical products. The Medicare Modernization Act contains provisions that may change U.S. importation laws and expand pharmacists' and wholesalers' ability to import cheaper versions of an approved drug and competing products from Canada, where there are government price controls. These changes to U.S. importation laws will not take effect unless and until the Secretary of Health and Human Services certifies that the changes will pose no additional risk to the public's health and safety and will result in a significant reduction in the cost of products to consumers. The Secretary of Health and Human Services has so far declined to approve a reimportation plan. Proponents of drug reimportation may attempt to pass legislation that would directly allow reimportation under certain circumstances. Legislation or regulations allowing the reimportation of drugs, if enacted, could decrease the price we receive for any product we may develop and adversely affect our future revenues and prospects for profitability.

Risks Related to our Dependence on Third Parties

We will be unable to directly control all aspects of our clinical trials due to our reliance on clinical research organizations (CROs) and other third parties that assist us in conducting clinical trials.

We will rely on CROs to conduct part or all of our preclinical studies and clinical trials for any product candidate, including our Phase 2 and Phase 3 trials for gemcabene. As a result, we will have limited control over the conduct, timing and completion of these clinical trials and the management of data developed through the clinical trials. Communicating with outside parties can also be challenging, potentially leading to mistakes as well as difficulties in coordinating activities. Outside parties may:

- have staffing difficulties;

- fail to comply with contractual obligations;
- experience regulatory compliance issues;
- undergo changes in priorities or become financially distressed; or
- form relationships with other entities, some of which may be our competitors.

These factors may adversely affect the willingness or ability of third parties to conduct our clinical trials and may subject us to unexpected cost increases that are beyond our control.

Moreover, the FDA and other global health authorities require us to comply with standards, commonly referred to as good clinical practices, for conducting, recording, and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of clinical trial participants are protected. Our reliance on third parties that we do not control does not relieve us of these responsibilities and requirements.

Problems with the timeliness or quality of the work of any CRO may lead us to seek to terminate our relationship with any such CRO and use an alternative service provider. Making this change may be costly and may delay our clinical trials, and contractual restrictions may make such a change difficult or impossible to effect. If we must replace any CRO that is conducting our clinical trials, our clinical trials may have to be suspended until we find another CRO that offers comparable services. The time that it takes us to find alternative organizations may cause a delay in the commercialization of gemcabene or may cause us to incur significant expenses to replicate data that may be lost. Although we do not believe that any CRO on which we may rely will offer services that are not available elsewhere, it may be difficult to find a replacement organization that can conduct our clinical trials in an acceptable manner and at an acceptable cost. Any delay in or inability to complete our clinical trials could significantly compromise our ability to secure regulatory approval of gemcabene and preclude our ability to commercialize gemcabene, thereby limiting or preventing our ability to generate revenue from its sales.

We rely completely on third parties to supply and manufacture our preclinical and clinical drug supplies for gemcabene, and we intend to rely on third parties to produce commercial supplies of gemcabene and preclinical, clinical and commercial supplies of any future product candidate.

We do not currently have, nor do we plan to acquire, the infrastructure or capability to internally manufacture our clinical drug supply of gemcabene, or any future product candidates, for use in the conduct of our preclinical studies and clinical trials, and we lack the internal resources and the capability to manufacture any product candidates on a clinical or commercial scale. The process of manufacturing drug products is complex, highly regulated and subject to several risks. For example, the facilities used by our contract manufacturers to manufacture the active pharmaceutical ingredient (or drug substance) and final drug product for gemcabene, or any future product candidates, must be inspected by the FDA and other comparable foreign regulatory agencies in connection with our submission of an NDA or relevant foreign regulatory submission to the applicable regulatory agency. In addition, the manufacturing of drug substance or product is susceptible to product loss due to contamination, equipment failure, improper installation or operation of equipment, or vendor or operator error. Moreover, the manufacturing facilities in which gemcabene or any future product candidates are made could be adversely affected by equipment failures, labor shortages, natural disasters, power failures or other factors.

We do not control the manufacturing process of, and are completely dependent on, our contract manufacturers to comply with current good manufacturing practices (cGMP) for manufacture of both active drug substances and finished drug products. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or applicable foreign regulatory agencies, we will not be able to secure and/or maintain regulatory approval for our products. In addition, we have no direct control over our contract manufacturers' ability to maintain adequate quality control, quality assurance and qualified personnel. Failure to satisfy the regulatory requirements for the production of those materials and products may affect the regulatory clearance of our contract manufacturers' facilities generally. If the FDA or a comparable foreign regulatory agency does not approve these facilities for the manufacture of gemcabene or any future product candidates, or if it withdraws its approval in the future, we may need to find alternative manufacturing facilities, which would adversely impact our ability to develop, obtain regulatory approval for or market gemcabene or such future product candidates. Furthermore, all of our contract

manufacturers are engaged with other companies to supply and/or manufacture materials or products for such companies, which exposes our manufacturers to regulatory and sourcing risks for the production of such materials and products. To the extent practicable, we attempt to identify more than one supplier, but some raw materials are available only from a single source or only one supplier has been identified, even in instances where multiple sources exist.

We have relied upon third-party manufacturers for the manufacture of our product candidate for preclinical and clinical testing purposes and intend to continue to do so in the future, including for commercial purposes. If our third party manufacturers are unable to supply drug substance and/or drug product on a commercial basis, we may not be able to successfully produce and market gemcabene, if approved, or could be delayed in doing so. For instance, we rely on one supplier for the drug substance for gemcabene. The manufacturer of the drug substance for gemcabene will need to manufacture batches of the drug substance that will serve as the validation batches that will be reviewed by the FDA in connection with its review of the NDA for gemcabene and as the supply of gemcabene, if approved and successfully launched commercially. If there is any delay or problem with the manufacture of these batches of drug substance or if there is a delay in producing finished product from these batches, the approval of gemcabene may be delayed or any potential launch of gemcabene may be adversely affected. We will rely on comparison of product specifications (identity, strength, quality, potency) to demonstrate equivalence of the current drug substance and/or drug product to the drug substance and/or drug product used in previously completed preclinical and clinical testing. If we are unable to demonstrate such equivalence, we may be required to conduct additional preclinical and/or clinical testing of our product candidate.

These and other problems with any manufacturer may lead us to seek to terminate our relationship with any such manufacturer and use an alternative manufacturer. Making this change may be costly, time consuming and difficult to effectuate, and may delay our research and development activities. If we must replace any manufacturer, our research and development activities may have to be suspended until we find another manufacturer that offers comparable services. The time that it takes us to find alternative organizations may cause a delay in the development and commercialization of gemcabene or any future product candidate.

We may form or seek strategic alliances or enter into additional licensing arrangements in the future, and we may not realize the benefits of such alliances or licensing arrangements.

We may form or seek strategic alliances, create joint ventures or collaborations or enter into additional licensing arrangements with third parties that we believe will complement or augment our development and commercialization efforts with respect to gemcabene and any future product candidates that we may develop. Any of these relationships may require us to incur non-recurring and other charges, increase our near and long-term expenditures, issue securities that dilute our existing stockholders or disrupt our management and business. Our likely collaborators include large and mid-size pharmaceutical companies, regional and national pharmaceutical companies and biotechnology companies. If we enter into any such arrangements with any third parties, we will likely have limited control over the amount and timing of resources that our collaborators dedicate to the development or commercialization of gemcabene or any future product candidate. Our ability to generate revenues from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements. We cannot be certain that, following a strategic transaction or license, we will achieve the revenue or specific net income that justifies such transaction.

Collaborations involving gemcabene or any future product candidate pose the following risks to us:

- collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not perform their obligations as expected;
- collaborators may not pursue development and commercialization or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in the collaborator's strategic focus or available funding or external factors such as an acquisition that diverts resources or creates competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing;

- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our product candidate if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours;
- a collaborator with marketing and distribution rights to one or more product candidates may not commit sufficient resources to the marketing and distribution of any such product candidate;
- collaborators may not properly maintain or defend our intellectual property rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our proprietary information or expose us to potential litigation;
- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability;
- disputes may arise between the collaborators and us that result in the delay or termination of the research, development or commercialization of our product candidate or that result in costly litigation or arbitration that diverts management attention and resources;
- we may lose certain valuable rights under circumstances identified in our collaborations, including if we undergo a change of control;
- collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates;
- collaborators may learn about our discoveries and use this knowledge to compete with us in the future;
- the results of collaborators' preclinical or clinical studies could harm or impair other development programs;
- there may be conflicts between different collaborators that could negatively affect those collaborations and potentially others;
- the number and type of our collaborations could adversely affect our attractiveness to future collaborators or acquirers;
- collaboration agreements may not lead to development or commercialization of our product candidate in the most efficient manner or at all. If a present or future collaborator of ours were to be involved in a business combination, the continued pursuit and emphasis on our product development or commercialization program under such collaboration could be delayed, diminished or terminated; and
- collaborators may be unable to obtain the necessary marketing approvals.

If future collaboration partners fail to develop or effectively commercialize gemcabene or any future product candidate for any of these reasons, such product candidate may not be approved for sale and our sales of such product candidate, if approved, may be limited, which would have an adverse effect on our operating results and financial condition.

If we are not able to establish new collaborations on commercially reasonable terms, we may have to alter our development and commercialization plans.

We face significant competition in attracting collaborators. Whether we reach a definitive agreement for collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors related to the associated product candidate. Those factors may include the design or results of clinical trials, the likelihood of approval by the FDA or similar regulatory authorities outside the United States, the potential market for the product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing

products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge and industry and market conditions generally. The collaborator may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us.

Much of the potential revenue from future collaborations may consist of contingent payments, such as payments for achieving regulatory milestones or royalties payable on sales of our product candidate, if approved. The milestone and royalty revenue that we may receive under these collaborations will depend upon our collaborators' ability to successfully develop, introduce, market and sell new our product candidate, if approved. In addition, collaborators may decide to enter into arrangements with third parties to commercialize products developed under collaborations related to our product candidate, which could reduce the milestone and royalty revenue received, if any.

We may also be restricted under existing collaboration agreements from entering into future agreements on certain terms with potential collaborators. Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators.

We may not be able to negotiate collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of the product candidate for which we are seeking to collaborate, reduce or delay its development program or one or more of our other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop our product candidate or bring it to market and generate product revenue.

Risks Related to our Intellectual Property

If we are unable to adequately protect our proprietary technology or maintain issued patents sufficient to protect gemcabene or any future product candidate, others could compete against us more directly, which would have an adverse impact on our business, results of operations, financial condition and prospects.

Our commercial success will depend in part on our success obtaining and maintaining issued patents and other intellectual property rights in the United States and elsewhere and protecting our proprietary technology. If we do not adequately protect our intellectual property and proprietary technology, competitors may be able to use our technologies and erode or negate any competitive advantage we may have, which could harm our business and ability to achieve profitability. We licensed patents relating to our current product candidate, gemcabene, from Pfizer. Pursuant to the license agreement, we are responsible for filing, prosecuting and maintaining the patent rights in Pfizer's name at our own cost and expense. In connection with this obligation, we are granted the first right to control the enforcement of the license patents against any third-party infringement actions. Risks related to our Pfizer license are discussed elsewhere in this "Risk Factors" section under "*We depend on intellectual property licensed from Pfizer for gemcabene, and the termination of this license would harm our business.*" The termination of this license could result in the loss of significant rights, which would harm our business.

As of February 20, 2017, our patent estate, including patents we own or license from third parties, on a worldwide basis, included four issued U.S. patents, eight pending U.S. patent applications, 45 issued patents in foreign jurisdictions including Canada, France, Germany, Great Britain, Ireland, Italy, Mexico and Spain and 16 pending patent applications in foreign jurisdictions including Australia, Canada, China, Europe, Hong Kong, Japan and Mexico. Our worldwide patents and pending applications all relate to our product candidate, gemcabene. Our patents claiming the gemcabene composition of matter generically, which were in-licensed from Pfizer, have all expired; however, our clinical formulation comprises a specific calcium salt crystal form of gemcabene, which form is claimed in U.S. Patent Number 6,861,555. This patent, which was in-licensed from Pfizer, is expected to expire in 2021, absent any patent term extension. Our current patent estate includes eight patent families that have claims directed to methods of treatment using gemcabene. These patent families include, for example, U.S. Patent Number 8,557,835, licensed from Pfizer that has claims directed to using a statin-gemcabene combination for treating hyperlipidemia, angina pectoris and atherosclerosis. U.S. Patent Number 8,557,835 is expected to expire in 2021, absent any patent term extension, and corresponding foreign patents are expected to expire in 2018, absent any adjustment or extension. Additionally, U.S.

Patent Number 8,846,761 and U.S. Patent Application Number 14/370,722, are owned by us. U.S. Patent Number 8,846,761 is directed to methods of decreasing a subject's risk for developing pancreatitis by administering gemcabene and is expected to expire in 2032, absent any patent term extension. Any foreign patent in this family that may issue is expected to expire in 2031, absent any patent term extension. U.S. Patent Application Number 14/370,722, is directed to methods of decreasing a patient's risk for developing coronary heart disease or preventing, delaying or reducing the severity of a secondary cardiovascular event by administering gemcabene with a statin. Related patent applications are pending in foreign jurisdictions including Australia, Canada, China, Europe, Japan and Mexico. Any patent that may issue in this family, absent any patent term adjustment or extension, is expected to expire in 2033.

In 2015-2017, we filed two non-provisional patent applications on methods of large scale manufacturing for making dicarboxyalkyl ethers (US Application Number 14/942,765 and corresponding PCT application Number PCT/US2015/060917), any patent issuing from this patent family is expected to expire in 2035. In addition, we filed U.S. provisional patent applications of which 62/300,393, 62/314,597, 62/411,997 and 62/412,017, are pending, and two PCT applications one for methods of treating mixed dyslipidemia using gemcabene in combination with statins and treatment of NASH using gemcabene as a monotherapy (PCT/US2016/060837), and the other relating to fixed dose combinations and modified release formulations of gemcabene and statins (PCT/US2016/060849). Two U.S. Patent Applications were filed as continuations of PCT/US2016/060837. U.S. Patent Application Number 15/416,911, is directed to methods of treating NASH by administering gemcabene as a monotherapy and U.S. Patent Application Number 15/424,620, is directed methods for treating Mixed Dyslipidemia by administering gemcabene and a statin. Any patent that may issue in either of these two families, absent any patent term adjustment or extension, is expected to expire in 2037.

The patent prosecution process is expensive and time-consuming, and we and our current or future licensors, licensees or collaboration partners may not be able to prepare, file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we or our licensors will fail to identify patentable aspects of inventions made in the course of development and commercialization activities before it is too late to obtain patent protection on them. Our and our licensors' patent applications cannot be enforced against third parties practicing the technology claimed in such applications unless and until a patent issues from such applications, and then only to the extent the issued claims cover the technology.

We cannot assure you that any of our patents have, or that any of our pending patent applications will mature into issued patents that will include, claims with a scope sufficient to protect gemcabene or any future product candidate. Others have developed technologies that may be related or competitive to our approach, and may have filed or may file patent applications and may have received or may receive patents that overlap or conflict with our patent applications, either by claiming the same methods or formulations or by claiming subject matter that could dominate our patent position. The patent positions of biotechnology and pharmaceutical companies, including our patent position, involve complex legal and factual questions, and, therefore, the issuance, scope, validity and enforceability of any patent claims that we may obtain cannot be predicted with certainty. Patents, if issued, may be challenged, deemed unenforceable, invalidated, or circumvented. U.S. patents and patent applications may also be subject to interference proceedings, *ex parte* reexamination, or *inter partes* review proceedings, supplemental examination and challenges in district court. Patents may be subjected to opposition, post-grant review, or comparable proceedings lodged in various national and regional patent offices. These proceedings could result in either loss of the patent or denial of the patent application or loss or reduction in the scope of one or more of the claims of the patent or patent application. In addition, such interference, re-examination, opposition, post-grant review, *inter partes* review, supplemental examination or revocation proceedings may be costly. Thus, any patents that we may own or exclusively license may not provide any protection against competitors. Furthermore, an adverse decision in an interference proceeding can result in a third-party receiving the patent right sought by us, which in turn could affect our ability to develop, market or otherwise commercialize gemcabene.

Furthermore, the issuance of a patent, while presumed valid, is not conclusive as to its validity or its enforceability and it may not provide us with adequate proprietary protection or competitive advantages against competitors with similar products. Competitors may also be able to design around our patents. Other parties may develop and obtain patent protection for more effective technologies, designs or methods. We may not be able to prevent the unauthorized disclosure or use of any technical knowledge or trade secrets by consultants, vendors, former employees and current employees. The laws of some foreign countries do not protect our proprietary rights to the same extent as the laws of the United States, and we may encounter significant problems in protecting our proprietary rights in these countries. If these developments were to occur, they could have a material adverse effect on our sales.

Our ability to enforce our patent rights depends on our ability to detect infringement. It is difficult to detect infringers who do not advertise the components that are used in their products. Moreover, it may be difficult or impossible to obtain evidence of infringement in a competitor's or potential competitor's product. Any litigation to enforce or defend our patent rights, if any, even if we were to prevail, could be costly and time-consuming and would divert the attention of our management and key personnel from our business operations. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded if we were to prevail may not be commercially meaningful.

In addition, proceedings to enforce or defend our patents could put our patents at risk of being invalidated, held unenforceable, or interpreted narrowly. Such proceedings could also provoke third parties to assert claims against us, including that some or all of the claims in one or more of our patents are invalid or otherwise unenforceable. If, in any proceeding, a court invalidated or found unenforceable our patents covering gemcabene or any future product candidate, our financial position and results of operations would be adversely impacted. In addition, if a court found that valid, enforceable patents held by third parties covered gemcabene or any future product candidate, our financial position and results of operations would also be adversely impacted.

The degree of future protection for our proprietary rights is uncertain, and we cannot ensure that:

- any of our patents, or any of our pending patent applications, if issued, will include claims having a scope sufficient to protect gemcabene;
- any of our pending patent applications will result in issued patents;
- we will be able to successfully commercialize gemcabene or any future product candidate, if approved, before our relevant patents expire;
- we were the first to make the inventions covered by each of our patents and pending patent applications;
- we were the first to file patent applications for these inventions;
- others will not develop similar or alternative technologies that do not infringe our patents;
- any of our patents will be valid and enforceable;
- any patents issued to us will provide a basis for an exclusive market for our commercially viable products, will provide us with any competitive advantages or will not be challenged by third parties;
- we will develop additional proprietary technologies or product candidates that are separately patentable; or
- that our commercial activities or products will not infringe upon the patents of others.

Patents have a limited lifespan. The natural expiration of a patent is generally 20 years after its effective filing date. Various extensions may be available; however, the life of a patent, and the protection it affords, is limited. Given the extensive period of time between patent filing and regulatory approval for a product candidate, the time during which we can market a product candidate under patent protection is limited, and our patent may expire before we obtain such approval. Without patent protection for gemcabene or any future product candidates, we may be open to competition from generic versions of our product candidates, which may affect the profitability of our product candidates.

If we do not obtain protection under the Hatch-Waxman Act and similar foreign legislation by extending the patent terms and obtaining data exclusivity for our product candidate, our business may be materially harmed.

Depending upon the timing, duration of regulatory review, and date of FDA marketing approval of gemcabene or any future product candidate, if any, one of our U.S. patents may be eligible for patent term restoration under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Act. The Hatch-Waxman Act provides for a patent restoration term of up to five years as compensation for the time the product is under FDA regulatory review (patent term extension). The duration of patent term extension is calculated based on the time spent in the regulatory review process. Our basic U.S. composition of matter patent for gemcabene has expired. We plan to seek

patent term extension for one of our patents related to gemcabene. However, we may not be granted an extension because of, for example, failing to apply within the applicable deadline, expiration of relevant patents prior to obtaining approval, or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request. If we are unable to obtain patent term extension or the term of any such extension is less than we request, our revenue could be reduced, possibly materially.

In addition, we believe that gemcabene is a NCE in the United States and may be eligible for data exclusivity under the Hatch-Waxman Act. A single-ingredient drug can be classified as a NCE if the FDA has not previously approved any other new drug containing the same active ingredient. Under sections 505(c)(3)(E)(ii) and 505(j)(5)(F)(ii) of the FDC Act, as amended, a NCE that is granted marketing approval may, even in the absence of patent protections, be eligible for five years of data exclusivity in the United States following marketing approval. During the data exclusivity period, if granted, the FDA is precluded from approving 505(b)(2) applications or abbreviated new drug applications submitted by another company that references the FDA's findings of safety and efficacy for the approved NDA. In the European Union, NCEs qualify for eight years of data exclusivity upon marketing authorization and an additional two years of market exclusivity. This data exclusivity, if granted, prevents regulatory authorities in the European Union from reviewing a generic application for eight years, after which generic marketing authorization can be approved but the generic drug may not be marketed during the two-year marketing exclusivity period. However, gemcabene may not be considered to be a NCE for these purposes or be entitled to the period of data exclusivity. If we are not able to gain or exploit the period of data exclusivity, we may face significant competitive threats to our commercialization of gemcabene from other manufacturers, including the manufacturers of generic alternatives. Further, even if our compound is considered to be a NCE and we are able to gain the prescribed period of data exclusivity, another company nevertheless could gain marketing approval for the same compound if they independently generate preclinical and clinical data and get market approval through the NDA process without benefit of our data.

If we fail to maintain orphan drug exclusivity for gemcabene for HoFH, we will have to rely on data and marketing exclusivity for HoFH that is not based on an orphan drug designation, if any, and on our intellectual property rights.

As part of our business strategy, in the United States we have obtained orphan drug designation for gemcabene for the treatment of HoFH. We may submit an application to the FDA for other orphan drug designations for gemcabene such as for the treatment of TG greater than approximately 750 mg/dL (F) or Familial Partial Lipodystrophy under the Orphan Drug Act, the FDA may designate a product as an orphan drug if it is a drug intended to treat a rare disease or condition, defined, in part, as a patient population of fewer than 200,000 in the United States.

In the United States, the company that first obtains FDA approval for a designated orphan drug for the specified rare disease or condition receives orphan drug marketing exclusivity for that drug for a period of seven years. This orphan drug exclusivity prevents the FDA from approving another application, including a full NDA, to market the same drug for the same orphan indication, except in very limited circumstances. For purposes of small molecule drugs, the FDA defines "same drug" as a drug that contains the same active pharmaceutical ingredient (API) and is intended for the same use as the drug in question. A designated orphan drug may not receive orphan drug exclusivity if it is approved for a use that is broader than the indication for which it received orphan designation. In addition, orphan drug exclusive marketing rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the drug to meet the needs of patients with the rare disease or condition.

The EMA grants orphan drug designation to promote the development of products that may offer therapeutic benefits for life-threatening or chronically debilitating conditions affecting not more than five in 10,000 people in the European Union. Orphan drug designation from the EMA provides ten years of marketing exclusivity following drug approval, subject to reduction to six years if the designation criteria are no longer met.

Even if we are able to obtain and maintain orphan drug exclusivity for gemcabene for HoFH, the designation may not effectively protect it from competition for HoFH because different drugs can be approved for the same condition. Moreover, even with an orphan drug designation, the FDA can subsequently approve a different formulation of the same API for the same condition if the FDA concludes that the later formulation of the API is safer, more effective or makes a major contribution to patient care.

Changes in U.S. patent law could diminish the value of patents in general, thereby impairing our ability to protect gemcabene and any product candidate we may pursue in the future.

In 2011, the United States enacted wide-ranging patent reform legislation with the America Invents Act (AIA).

An important change introduced by the AIA is that, as of March 16, 2013, the United States transitioned to a “first-to-file” system for deciding which party should be granted a patent when two or more patent applications are filed by different parties claiming the same invention. A third party that files a patent application in the U.S. Patent and Trademark Office (USPTO) after that date but before us could therefore be awarded a patent covering an invention of ours even if we had made the invention before it was made by the third party. This will require us to be cognizant going forward of the time from invention to filing of a patent application, but circumstances could prevent us from promptly filing patent applications on our inventions.

Among some of the other changes introduced by the AIA are changes that limit where a patentee may file a patent infringement suit and providing opportunities for third parties to challenge any issued patent in the USPTO. This applies to all of our U.S. patents, even those issued before March 16, 2013. Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in U.S. federal courts necessary to invalidate a patent claim, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims that would not have been invalidated if first challenged by the third party as a defendant in a district court action. The AIA and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

Additionally, the U.S. Supreme Court has ruled on several patent cases in recent years, such as *Association for Molecular Pathology v. Myriad Genetics, Inc. (Myriad I)*, *Mayo Collaborative Services v. Prometheus Laboratories, Inc.* and *Alice Corporation Pty. Ltd. v. CLS Bank International*, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future.

We may not be able to protect or practice our intellectual property rights throughout the world.

In jurisdictions where we have not obtained patent protection, competitors may use our intellectual property to develop their own products and further, may export otherwise infringing products to territories where we have patent protection, but where it is more difficult to enforce a patent as compared to the U.S. Competitor products may compete with gemcabene, if approved, or any future product candidate in jurisdictions where we do not have issued or granted patents or where our issued or granted patent claims or other intellectual property rights are not sufficient to prevent competitor activities in these jurisdictions. The legal systems of certain countries, particularly certain developing countries, make it difficult to enforce patents and such countries may not recognize other types of intellectual property protection, particularly that relating to pharmaceuticals. This could make it difficult for us to prevent the infringement of our patents or marketing of competing products in violation of our proprietary rights generally in certain jurisdictions. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial cost and divert our efforts and attention from other aspects of our business.

The laws of some jurisdictions do not protect intellectual property rights to the same extent as the laws in the United States, and many companies have encountered significant difficulties in protecting and defending such rights in such jurisdictions. If we, or our licensors, encounter difficulties in protecting, or are otherwise precluded from effectively protecting, the intellectual property rights important for our business in such jurisdictions, the value of these rights may be diminished and we may face additional competition from others in those jurisdictions. Many countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of such patent. If we, or any of our licensors, are forced to grant a license to third parties with respect to any patents relevant to our business, our competitive position in the relevant jurisdiction may be impaired and our business and results of operations may be adversely affected.

We may become involved in lawsuits to protect or enforce our patents and other intellectual property rights, which could be expensive, time consuming and unsuccessful.

Competitors may infringe our patents and other intellectual property rights. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time consuming. In addition, in an infringement proceeding, a court may decide that a patent of ours is invalid or unenforceable, or may refuse to stop the other party from using the technology on the grounds that our patents do not cover the technology in question. An adverse result in any litigation proceeding could put one or more of our patents at risk of being invalidated or interpreted narrowly. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. Moreover, there can be no assurance that we will have sufficient financial or other resources to file and pursue such infringement claims, which typically last for years before they are concluded.

Litigation proceedings may fail and, even if successful, may result in substantial costs and distraction of our management and other employees. We may not be able to prevent, alone or with our collaborators, misappropriation of our proprietary rights, particularly in countries where the laws may not protect those rights as fully as in the United States.

In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock.

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain and could have an adverse effect on the success of our business.

Our commercial success depends upon our ability and the ability of our collaborators to develop, manufacture, market and sell gemcabene and any other product candidate we may pursue in the future and use our proprietary technologies without infringing the proprietary rights and intellectual property of third parties. The biotechnology and pharmaceutical industries are characterized by extensive litigation regarding patents and other intellectual property rights. We may in the future become party to, or threatened with, adversarial proceedings or litigation regarding intellectual property rights with respect to our medicines and technology, including interference or derivation proceedings, post-grant reviews, inter partes reviews, or other procedures before the USPTO or other similar procedures in foreign jurisdictions. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future. If we are found to infringe a third party's intellectual property rights, we could be required to obtain a license from such third party to continue developing and marketing our medicines and technology. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors and other third parties access to the same technologies licensed to us. We could be forced, including by court order, to cease developing and commercializing the infringing technology or medicine. In addition, we could be found liable for substantial monetary damages, potentially including treble damages and attorneys' fees, if we are found to have willfully infringed. A finding of infringement could prevent us from commercializing a product candidate or force us to cease some of our business operations, which could harm our business. Alternatively, we may need to redesign our infringing products, which may be impossible or require substantial time and monetary expenditure. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

The cost to us of any litigation or other proceeding relating to patent or other proprietary rights, even if resolved in our favor, could be substantial and may result in substantial costs and distraction of our management and other employees. Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could delay our research and development efforts and limit our ability to continue our operations.

We may be subject to damages resulting from claims that our employees or we have wrongfully used or disclosed alleged trade secrets of their former employers.

Our employees and consultants have been previously employed at other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we are not aware of any claims currently pending against

us, we may be subject to claims that these employees or we have inadvertently or otherwise used or disclosed trade secrets or other proprietary information or intellectual property of the former employers of our employees. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management. If we fail in defending such claims, in addition to paying money claims, we may lose valuable intellectual property rights or personnel. A loss of key personnel or their work product could hamper or prevent our ability to commercialize gemcabene, which would adversely affect our commercial development efforts.

If we are not able to adequately prevent disclosure of trade secrets and other proprietary information, the value of any product we may pursue could be significantly diminished.

We may rely upon trade secrets, know-how and continuing technological innovation to develop and maintain our competitive position. However, trade secrets are difficult to protect. We rely in part on confidentiality agreements with our employees, consultants, outside scientific collaborators, sponsored researchers, contract manufacturers, vendors and other advisors to protect our trade secrets and other proprietary information. These agreements may not effectively prevent disclosure of confidential information and may not provide an adequate remedy in the event of unauthorized disclosure of confidential information. In addition, we cannot guarantee that we have executed these agreements with each party that may have or have had access to trade secrets.

Moreover, because we acquired certain rights to gemcabene from Pfizer, we must rely on Pfizer's practices, and those of its predecessors, with regard to parties that may have had access to trade secrets related thereto. Any party with whom they or we have executed such an agreement may breach that agreement and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them, or those to whom they disclose such trade secrets, from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor or other third-party, our competitive position would be harmed.

We have filed U.S. applications for certain of our trademarks, but we have not yet obtained registration of any of our trademarks.

We have filed U.S. applications for three trademarks, "Gemphire", the Gemphire logo and "Advancing a class on top of statins", but we have not yet obtained registration of any of our trademarks in the United States or other countries. If we do not secure and maintain registrations for our trademarks, we may encounter more difficulty in enforcing them against third parties than we otherwise would, which could affect our business. We have also not yet registered trademarks for any product candidate in any jurisdiction. When we file trademark applications for a product candidate, those applications may not be allowed for registration, and registered trademarks may not be obtained, maintained or enforced. During trademark registration proceedings in the United States and foreign jurisdictions, we may receive rejections. We are given an opportunity to respond to those rejections, but we may not be able to overcome such rejections. In addition, in the USPTO and in comparable agencies in many foreign jurisdictions, third parties are given an opportunity to oppose pending trademark applications and to seek to cancel registered trademarks. Opposition or cancellation proceedings may be filed against our trademarks, and our trademarks may not survive such proceedings.

In addition, any proprietary name we propose to use with gemcabene or any future product candidate in the United States must be approved by the FDA, regardless of whether we have registered it, or applied to register it, as a trademark. The FDA typically conducts a review of proposed drug names, including an evaluation of potential for confusion with other drug names. If the FDA objects to any proposed proprietary drug name for any product candidate, we may be required to expend significant additional resources in an effort to identify a suitable substitute proprietary drug name that would qualify under applicable trademark laws, not infringe the existing rights of third parties and be acceptable to the FDA.

If we register any of our trademarks, our trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to infringe on other marks. We may not be able to protect our rights to these trademarks and trade names or may be forced to stop using these names, which we need for name recognition by potential partners

or customers in our markets of interest. If we are unable to establish name recognition based on our trademarks and trade names, we may not be able to compete effectively and our business may be adversely affected.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for noncompliance with these requirements.

The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment or other provisions during the patent application process. In addition, periodic maintenance and annuity fees on any issued patent are due to be paid to the USPTO and foreign patent agencies in several stages over the lifetime of the patent. While an inadvertent lapse can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors might be able to enter the market, which would have an adverse effect on our business.

Risks Related to Employee Matters and Managing Growth

We are dependent on our key personnel, and if we are not successful in attracting and retaining highly qualified personnel, we may not be able to successfully implement our business strategy.

We are highly dependent on our management, scientific and medical personnel, including Dr. Charles L. Bisgaier, our co-founder, Chairman of our board of directors and Chief Scientific Officer, and Mina Sooch, our President, Chief Executive Officer and director. We have entered into employment agreements with our executive officers, but any employee may terminate his or her employment with us. The loss of the services of either Dr. Bisgaier or Ms. Sooch, any of our executive officers, other key employees or consultants and other scientific and medical advisors in the foreseeable future, might impede the achievement of our research, development and commercialization objectives. We rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us. Recruiting and retaining qualified scientific personnel and business and commercial personnel will also be critical to our success. We may not be able to attract and retain these personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific personnel from universities and research institutions. Failure to succeed in clinical trials may also make it more challenging to recruit and retain qualified scientific personnel.

We will need to develop and expand our company, and we may encounter difficulties in managing this development and expansion, which could disrupt our operations.

As of December 31, 2016, we had twelve full-time employees, and we expect to increase our number of employees and the scope of our operations as we further the clinical development of gemcabene and continue to operate as a public company. To manage our anticipated development and expansion, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Also, our management may need to divert a disproportionate amount of its attention away from its day-to-day activities and devote a substantial amount of time to managing these development activities. Due to our limited resources, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. This may result in weaknesses in our infrastructure, and give rise to operational mistakes, loss of business opportunities, loss of employees and reduced productivity among remaining employees. The physical expansion of our operations may lead to significant costs and may divert financial resources from other projects, such as the development of gemcabene. If our management is unable to effectively manage our expected development and expansion, our expenses may increase more than expected, our ability to generate or increase our revenue could be reduced and we may not be able to implement our business strategy. Our future financial performance and our ability to commercialize gemcabene or any future product candidate, if approved, and compete effectively will depend, in part, on our ability to effectively manage the future development and expansion of our company.

A variety of risks associated with operating internationally for us and our collaborators could adversely affect our business.

In addition to our U.S. operations, we may pursue international operations in the future and would face risks associated with such global operations, including possible unfavorable regulatory, pricing and reimbursement, legal, political, tax and labor conditions, which could harm our business. We plan to conduct clinical trials outside of the United States. We are subject to numerous risks associated with international business activities, including:

- compliance with differing or unexpected regulatory requirements for gemcabene or any other product candidate;
- different medical practices and customs affecting acceptance of gemcabene, if approved, or any other approved product in the marketplace;
- language barriers;
- the interpretation of contractual provisions governed by foreign law in the event of a contract dispute;
- difficulties in staffing and managing foreign operations, and an inability to control commercial or other activities where we are relying on third parties;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- potential liability under the Foreign Corrupt Practice Act of 1977 or comparable foreign regulations;
- production shortages resulting from any events affecting raw material supply or manufacturing capability abroad;
- foreign government taxes, regulations and permit requirements;
- U.S. and foreign government tariffs, trade restrictions, price and exchange controls and other regulatory requirements;
- economic weakness, including inflation, natural disasters, war, events of terrorism or political instability in particular foreign countries;
- fluctuations in currency exchange rates, which could result in increased operating expenses and reduced revenues;
- compliance with tax, employment, immigration and labor laws, regulations and restrictions for employees living or traveling abroad;
- changes in diplomatic and trade relationships; and
- challenges in enforcing our contractual and intellectual property rights, especially in those foreign countries that do not respect and protect intellectual property rights to the same extent as the United States.

Our business and operations would suffer in the event of system failures or unplanned events.

Despite the implementation of security measures, our internal computer systems and those of our current and future contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. While we are not aware of any such material system failure, accident or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our business operations. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development and commercialization of our product candidates could be delayed.

Furthermore, any unplanned event, such as flood, fire, explosion, tornadoes, earthquake, extreme weather condition, medical epidemics, power shortage, telecommunication failure or other natural or manmade accidents or incidents that result in us being unable to fully utilize the facilities, may have an adverse effect on our ability to operate our business, particularly on a daily basis, and have significant negative consequences on our financial and operating conditions. Loss of access to these facilities may result in increased costs, delays in the development of our product candidates or interruption of our business operations.

Risks Related to our Common Stock

The price of our common stock may be volatile and fluctuate substantially, which could result in substantial losses of our common stock.

The trading price of our common stock is likely to be highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control, including limited trading volume. In addition to the factors discussed in this “Risk Factors” section and elsewhere in this report, these factors include:

- adverse results or delays in preclinical studies, clinical trials, regulatory decisions or the development status of gemcabene or any product candidates we may pursue in the future;
- decisions to initiate a clinical trial, not initiate a clinical trial, or terminate an existing clinical trial;
- adverse regulatory decisions, including failure to receive regulatory approval for gemcabene;
- changes in applicable laws, rules or regulations;
- disputes with Pfizer regarding our licensed rights to gemcabene;
- adverse developments concerning our manufacturers, suppliers, collaborators and other third parties;
- our failure to commercialize gemcabene or any product candidates we may pursue in the future;
- the success of competitive drugs;
- additions or departures of key scientific or management personnel;
- unanticipated safety concerns related to the use of gemcabene or any product candidates we may pursue in the future;
- our announcements or our competitor’s announcements regarding new products, enhancements, significant contracts, acquisitions or strategic partnerships and investments;
- changes in the structure of healthcare payment systems;
- the size and growth of our target markets;
- our failure, or companies perceived to be similar to us, to meet external expectations or management guidance;
- fluctuations in our quarterly financial results or the quarterly financial results of companies perceived to be similar to us;
- publication of research reports about us or our industry, recommendations, earning results or estimates or withdrawal of research coverage by securities analysts;
- changes in the market valuations of similar companies;

- changes in general economic, political and market conditions in any of the regions in which we conduct our business;
- changes in our capital structure or dividend policy, future issuances of securities, sales of large blocks of common stock by our stockholders or our incurrence of additional debt;
- trading volume of our common stock;
- changes in accounting practices and ineffectiveness of our internal controls;
- disputes, litigation or developments relating to proprietary rights;
- timing of milestones and royalty payments; and
- other events or factors, many of which are beyond our control.

In addition, the stock market in general, NASDAQ, and the stock of biopharmaceutical companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. Broad market and industry factors may negatively affect the market price of our common stock, regardless of our actual operating performance. In the past, securities class action litigation has often been instituted against companies following periods of volatility in the market price of a company's securities. This type of litigation, if instituted, could result in substantial costs and a diversion of management's attention and resources, which would harm our business, operating results or financial condition.

Provisions in our corporate charter documents and under Delaware law could make an acquisition of us, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our corporate charter and our bylaws may discourage, delay or prevent a merger, acquisition or other change in control of us that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, because our board of directors is responsible for appointing the members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Among other things, these provisions:

- establish a classified board of directors such that not all members of the board are elected at one time;
- allow the authorized number of our directors to be changed only by resolution of our board of directors;
- limit the manner in which stockholders can remove directors from the board;
- establish advance notice requirements for stockholder proposals that can be acted on at stockholder meetings and nominations to our board of directors;
- require that stockholder actions must be effected at a duly called stockholder meeting and prohibit actions by our stockholders by written consent;
- prohibit stockholders from calling special meetings;
- authorize our board of directors to issue preferred stock without stockholder approval, which preferred stock may include rights superior to the rights of the holders of common stock, and which could be used to institute a shareholder rights plan, or so-called "poison pill," that would work to dilute the stock ownership of a potential hostile acquirer, effectively preventing acquisitions that have not been approved by our board of directors; and

- require the approval of the holders of at least two-thirds of the votes that all our stockholders would be entitled to cast to amend or repeal certain provisions of our charter or bylaws.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner.

We do not know whether an active, liquid and orderly trading market will develop for our common stock or what the market price of our common stock will be and as a result it may be difficult for you to sell your shares of our common stock.

Prior to the IPO there has been no public market for shares of our common stock. Although our common stock has been approved for listing on NASDAQ, an active trading market for our shares may never develop or be sustained. You may not be able to sell your shares quickly or at the market price if trading in shares of our common stock is not active. Further, an inactive market may also impair our ability to raise capital by selling shares of our common stock and may impair our ability to enter into strategic partnerships or acquire companies or products by using our shares of common stock as consideration.

If securities analysts do not publish research or reports about our business or if they publish negative evaluations of our stock, the price of our stock could decline.

If one or more of the analysts covering our business downgrade their evaluations of our stock or publish inaccurate or unfavorable research about our business, the price of our stock could decline. If one or more of these analysts cease to cover our stock, we could lose visibility in the market for our stock, which in turn could cause our stock price and trading volume to decline.

Our executive officers, directors, principal stockholders and their affiliates exercise significant control over our company, which will limit your ability to influence corporate matters and could delay or prevent a change in corporate control.

As of December 31, 2016, our officers, directors, five percent or greater stockholders and their respective affiliates had beneficial ownership, in the aggregate, of approximately 63.7% of our outstanding common stock.

These stockholders, if they act together, will be able to influence our management and affairs and control the outcome of matters submitted to our stockholders for approval, including the election of directors, amendments of our organizational documents, and any merger, consolidation, sale of all or substantially all of our assets or other major corporate transaction. These stockholders acquired their shares of common stock for substantially less than the current trading price of our common stock, and these stockholders may have interests, with respect to their common stock, that are different from yours. In addition, this concentration of ownership might adversely affect the market price of our common stock, have the effect of delaying, deferring or preventing a change of control of our company, or discourage a potential acquirer from making a tender offer or otherwise attempting to obtain control of us.

We are an “emerging growth company,” and we cannot be certain if the reduced reporting requirements applicable to emerging growth companies will make our common stock less attractive to investors.

We are an “emerging growth company,” as defined in the JOBS Act. For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not “emerging growth companies,” including exemption from compliance with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002 (Sarbanes-Oxley Act), reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a non-binding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. Under the JOBS Act, emerging growth companies can also delay adopting new or revised accounting standards until such time as those standards apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

We will remain an emerging growth company until the earlier of (1) the last day of the fiscal year (a) following the fifth anniversary of the closing of the IPO, (b) in which we have total annual gross revenue of at least \$1 billion, or (c) in which we are deemed to be a large accelerated filer, which means the market value of our common stock that is held by non-affiliates exceeds \$700 million as of the prior June 30th, and (2) the date on which we have issued more than \$1 billion in non-convertible debt during the prior three-year period.

Even after we no longer qualify as an emerging growth company, we may still qualify as a “smaller reporting company,” which would allow us to take advantage of many of the same exemptions from disclosure requirements including exemption from compliance with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act and reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements.

We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

We will incur increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives.

As a public company, and particularly after we are no longer an “emerging growth company,” we will incur significant legal, accounting and other expenses that we did not incur as a private company. For example, we will be subject to the reporting requirements of the Exchange Act, which will require, among other things, that we file with the SEC annual, quarterly and current reports with respect to our business and financial condition. In addition, the Sarbanes-Oxley Act and rules subsequently implemented by the SEC and NASDAQ have imposed various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will need to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. For example, we expect that these rules and regulations may make it more difficult and more expensive for us to obtain director and officer liability insurance.

Further, there are significant corporate governance and executive compensation related provisions in the Dodd-Frank Wall Street Reform and Consumer Protection Act that require the SEC to adopt additional rules and regulations in these areas such as “say on pay” and proxy access. Recent legislation permits emerging growth companies to implement many of these requirements over a longer period and up to five years from the pricing of the IPO. We intend to take advantage of this new legislation but cannot guarantee that we will not be required to implement these requirements sooner than budgeted or planned and thereby incur unexpected expenses. Stockholder activism, the current political environment and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact the manner in which we operate our business in ways we cannot currently anticipate.

We are subject to Section 404 of the Sarbanes-Oxley Act and the related rules of the SEC that generally require our management and independent registered public accounting firm to report on the effectiveness of our internal control over financial reporting. Beginning with the second annual report that we will be required to file with the SEC, Section 404 of the Sarbanes-Oxley Act requires an annual management assessment of the effectiveness of our internal control over financial reporting. However, for so long as we remain an “emerging growth company” as defined in the JOBS Act, we intend to take advantage of certain exemptions from various reporting requirements that are applicable to public companies that are not emerging growth companies, including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act. Once we are no longer an “emerging growth company” or, if before such date, we opt to no longer take advantage of the applicable exemption, we will be required to include an opinion from our independent registered public accounting firm on the effectiveness of our internal control over financial reporting.

To date, we have never conducted a review of our internal control for the purpose of providing the reports required by these rules. To achieve compliance with Section 404 within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, hire additional finance and accounting personnel, potentially engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing that controls are

functioning as documented and implement a continuous reporting and improvement process for internal control over financial reporting. During the course of our review and testing, we may identify deficiencies and be unable to remediate them before we must provide the required reports. We or our independent registered public accounting firm may not be able to conclude on an ongoing basis that we have effective internal control over financial reporting, which could harm our operating results, cause investors to lose confidence in our reported financial information and cause the trading price of our stock to fall. Furthermore, if we have a material weakness in our internal control over financial reporting, we may not detect errors on a timely basis and our financial statements may be materially misstated.

In addition, as a public company we will be required to timely file accurate quarterly and annual reports with the SEC under the Exchange Act. In order to report our results of operations and financial statements on an accurate and timely basis, we will depend on CROs to provide timely and accurate notice of their costs to us. Any failure to report our financial results on an accurate and timely basis could result in sanctions, lawsuits, delisting of our shares from NASDAQ or other adverse consequences that would materially harm our business.

We do not anticipate declaring or paying, in the foreseeable future, any cash dividends on our capital stock and, consequently, your ability to achieve a return on your investment will depend on appreciation in the price of our common stock.

We have never declared or paid any cash dividend on our capital stock and do not currently intend to do so in the foreseeable future. We currently anticipate that we will retain future earnings for the development, operation and expansion of our business. Therefore, the success of an investment in shares of our common stock will depend upon any future appreciation in their value. There is no guarantee that shares of our common stock will appreciate in value or even maintain the price at which you purchased them.

A significant portion of our total outstanding shares are restricted from immediate resale but may be sold into the market in the near future, which could cause the market price of our common stock to drop significantly, even if our business is doing well.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. As of December 31, 2016, we had 9,270,255 shares of common stock outstanding. This included 2,121,435 shares that we sold in the IPO that, may be resold in the public market immediately without restriction. The remaining 7,148,820 shares, as well as any shares purchased by our affiliates in the IPO, are currently or will be restricted as a result of securities laws.

Moreover, holders of an aggregate of approximately 1,436,161 shares of our common stock will have rights, subject to some conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders.

An aggregate of 355,200 shares reserved under the A&R 2015 Plan, 102,000 shares reserved under the Inducement Plan and 150,000 shares reserved under our employee stock purchase plan remained available for issuance as of December 31, 2016. If a large number of these shares are sold in the public market, the sales could reduce the trading price of our common stock.

Our issuance of the common stock in connection with the IPO may have resulted in an “ownership change” at the time of issuance, or has increased the risk that we could experience an ownership change in the future. Any ownership change would significantly limit our ability to utilize our net operating loss carryforwards and certain other tax attributes.

As of December 31, 2016, we had approximately \$6.2 million in U.S. federal and state net operating loss carryforwards, which will begin to expire in 2034 for federal and 2026 for state, that we can use in certain circumstances to offset any future taxable income and thus reduce any federal income tax liability. We also had net tax credit carryforwards of \$0.7 million and \$24,000 available to reduce future tax liabilities, if any, for U.S. federal and state purposes, respectively. Our ability to utilize these net operating losses and tax credit carryforwards to offset future taxable income may be significantly limited if we have experienced or if we experience in the future an “ownership change,” as defined in Section 382 of the Internal Revenue Code of 1986, as amended, or the Code. In general, an ownership change will occur if there is a cumulative change in our ownership by “5-percent shareholders” (as defined in the Code) that exceeds 50

percentage points over a rolling three-year period. A corporation that experiences an ownership change will generally be subject to an annual limitation on the corporation's subsequent use of net operating loss carryovers that arose from pre-ownership change periods and use of losses that are subsequently recognized with respect to assets that had a built-in-loss on the date of the ownership change. The amount of the annual limitation generally equals the value of the corporation immediately before the ownership change multiplied by the long-term tax-exempt interest rate (subject to certain adjustments). To the extent that the limitation in a post-ownership-change year is not fully utilized, the amount of the limitation for the succeeding year will be increased.

We do not expect to have experienced an ownership change as a result of our issuance of common stock in connection with the IPO. Nevertheless, the rules regarding the determination of whether an ownership change exists are complicated and are subject to differing interpretations, and it is possible that such issuances might be treated as having resulted in an ownership change. We have not completed a study to assess whether an ownership change for purposes of Section 382 has occurred, or whether there have been multiple ownership changes since our inception, due to the significant costs and complexities associated with such study. Even if there was no ownership change as a result of such issuance, the issuance of stock pursuant to the IPO will be taken into account in determining the cumulative change in our ownership for Section 382 purposes. As a result, the IPO has materially increased the risk that we could experience an ownership change in the future. If we experience an ownership change, we may not be able to fully utilize our net operating losses, resulting in additional income taxes and a reduction in our stockholders' equity.

Our amended and restated bylaws designate the Court of Chancery of the State of Delaware as the sole and exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated bylaws provide that, subject to limited exceptions, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law, as amended, our amended and restated certificate of incorporation or our amended and restated bylaws, any action to interpret, apply, enforce or determine the validity of our amended and restated certificate of incorporation or our amended and restated bylaws or any other action asserting a claim against us that is governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our amended and restated certificate of incorporation described above. This choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and employees. Alternatively, if a court were to find these provisions of our amended and restated certificate of incorporation inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could adversely affect our business and financial condition.

Unstable market and economic conditions may have serious adverse consequences on our business, financial condition and stock price.

The global credit and financial markets have experienced extreme volatility and disruptions in the past several years, including severely diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, increases in unemployment rates and uncertainty about economic stability. We cannot assure you that further deterioration in credit and financial markets and confidence in economic conditions will not occur. Our general business strategy may be adversely affected by any such economic downturn, volatile business environment or continued unpredictable and unstable market conditions. If the current equity and credit markets deteriorate, or do not improve, it may make any necessary debt or equity financing more difficult, more costly, and more dilutive. Failure to secure any necessary financing in a timely manner and on favorable terms could have a material adverse effect on our growth strategy, financial performance and stock price and could require us to delay or abandon clinical development plans. In addition, there is a risk that one or more of our current service providers, manufacturers and other partners may not survive these difficult economic times, which could directly affect our ability to attain our operating goals on schedule and on budget.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Not applicable

ITEM 2. PROPERTIES

We lease an approximately 5,300 square foot facility in Livonia, Michigan that is primarily used for our headquarters and our research and development activities under a 3 year non-cancellable facility lease that commenced in August 2016. We also lease approximately 1,450 square feet for limited use of office space relating to research and development in our previous Northville, Michigan headquarters location under a cancelable lease agreement that became effective in August 2016 and expires in September 2017. We believe that these facilities are adequate to meet our current needs, and that suitable additional alternative spaces will be available in the future on commercially reasonable terms.

ITEM 3. LEGAL PROCEEDINGS

From time to time, we may be involved in various claims and legal proceedings relating to claims arising out of our operations. We are not currently a party to any legal proceedings that, in the opinion of our management, are likely to have a material adverse effect on our business. Regardless of outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II**ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES*****Price Range of Common Stock***

Our common stock has been listed on the NASDAQ Global Market under the symbol "GEMP" since August 5, 2016. Our common stock priced at \$10.00 per share in our initial public offering on August 4, 2016. Prior to that date, there was no public trading market for our common stock. The following table sets forth for the periods indicated the high and low sale prices per share of our common stock as reported on the NASDAQ Global Market:

The following table sets forth the high and low intra-day sales prices of our common stock for the periods indicated.

	High	Low
2016		
Third quarter (from August 5, 2016)	\$ 13.98	\$ 8.50
Fourth quarter	\$ 11.95	\$ 7.25

Stockholders

On March 3, 2017, we had 9,272,582 shares of common stock outstanding and 114 holders of record of our common stock. A substantially greater number of holders are beneficial owners whose shares are held of record by banks, brokers and other nominees. The transfer agent and registrar for our common stock is Computershare, Inc.

Dividend Policy

We have never declared or paid any dividends on our common stock, and we do not currently intend to pay any dividends on our common stock for the foreseeable future. Any future determination to pay dividends on our common stock will be, subject to applicable law, at the discretion of our Board of Directors and will depend upon, among other factors, our results of operations, financial condition, capital requirements, and contractual restrictions in loan or other agreements.

Recent Sales of Unregistered Equity Securities

On March 10 2017, we entered into a securities purchase agreement for a private placement with a select group of accredited investors 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. The private placement included 56,678 units sold to 3 board members, for aggregate proceeds totaling approximately \$0.5 million and 52,798 units sold to 1 investor who is related to 1 board member, for proceeds totaling approximately \$0.5 million. Piper Jaffray & Co. acted as sole lead placement agent and Laidlaw & Company (UK) Ltd. and LifeSci Capital LLC acted as co-placement agents in connection with the private placement and will receive fees of approximately \$1.0 million in the aggregate.

The securities were issued and sold in the private placement only to accredited investors in reliance on the exemption from registration provided by Section 4(a)(2) of the Securities Act of 1933, as amended (the “Securities Act”), and Rule 506 of Regulation D promulgated thereunder, have not been registered under the Securities Act of 1933, as amended, or state securities laws, and may not be offered or sold in the United States absent registration with the SEC or an applicable exemption from such registration requirements. We have agreed to file a registration statement with the SEC covering the resale of the shares of common stock issued in the private placement and issuable upon exercise of the warrant issued in the private placement.

Use of Proceeds from Registered Securities

On August 4, 2016, our Registration Statement on Form S-1 (File No 333-210815) relating to our IPO was declared effective by the Securities and Exchange Commission (SEC). The Registration Statement registered an aggregate of 3,450,000 shares of our common stock, including 450,000 shares of common stock registered to cover in full over-allotments by the underwriters. On August 10, 2016, we closed our IPO whereby 3,000,000 shares of our common stock were sold at a public offering price of \$10.00 per share. On September 8, 2016, we closed the sale of 27,755 shares of our common stock at the public offering price of \$10.00 per share, representing a partial exercise of the underwriters’ over-allotment option, following which, the IPO terminated.

The managing underwriters of the IPO were Jefferies LLC and RBC Capital Markets, LLC. We paid to the underwriters of the initial public offering underwriting discounts and commissions totaling approximately \$2.1 million. In addition, we incurred expenses of approximately \$2.1 million which, when added to the underwriting discounts and commissions, amounted to total expenses of approximately \$4.2 million. Thus, the net offering proceeds, after deducting underwriting discounts and commissions and offering expenses, were approximately \$26.1 million.

There has been no material change in the planned use of proceeds from our IPO as described in our final prospectus filed with the SEC pursuant to Rule 424(b) on August 8, 2016.

Securities Authorized for Issuance under Equity Compensation Plans

The information called for by this item is incorporated by reference to our Proxy Statement for the 2017 Annual Meeting of Stockholders. See Part III, Item 12 “Security Ownership of Certain Beneficial Owners and Management and Related Stockholders Matters.”

ITEM 6. SELECTED FINANCIAL DATA

We have derived the following selected statement of operations data for the years ended December 31, 2016, 2015 and 2014 and the selected balance sheet data as of December 31, 2016 and 2015 from our audited financial statements included elsewhere in this report. The selected balance sheet information as of December 31, 2014 is derived from our audited financial statements which are not included in this report.

Our historical results are not necessarily indicative of the results that may be expected in the future. You should read the selected financial data below in conjunction with “Part II, Item 7. “Management’s Discussion and Analysis of Financial

Condition and Results of Operations” and our financial statements and the related notes included in Part II, Item 8 “Financial Statements and Supplementary Data” in this Report.

Statements of Operations Data:

	Year Ended December 31,		
	2016	2015	2014
Operating expenses:			
General and administrative	\$ 5,956	\$ 3,177	\$ 214
Research and development	8,740	3,991	52
Acquired in-process research and development	—	908	—
Total operating expenses	14,696	8,076	266
Loss from operations	(14,696)	(8,076)	(266)
Interest income (expense)	114	(762)	(55)
Loss on convertible note extinguishment	—	(198)	—
Other (expense) income	(4)	7	1
Loss before income taxes	(14,586)	(9,029)	(320)
Provision (benefit) for income taxes	—	—	—
Net loss	(14,586)	(9,029)	(320)
Other comprehensive loss, net of tax	—	—	—
Comprehensive loss	\$ (14,586)	\$ (9,029)	\$ (320)
Net loss	\$ (14,586)	\$ (9,029)	\$ (320)
Adjustment to redemption value on Series A convertible preferred stock	(366)	(2,968)	—
Premium upon substantial modification of convertible notes with certain stockholders	—	(1,047)	—
Net loss attributable to common stockholders	\$ (14,952)	\$ (13,044)	\$ (320)
Net loss per share:			
Basic and diluted	\$ (2.57)	\$ (4.54)	\$ (0.21)
Number of shares used in per share calculations:			
Basic and diluted	5,809,396	2,875,053	1,521,703

Balance Sheet Information:

	Year Ended December 31,		
	2016	2015	2014
Cash and cash equivalents	\$ 24,033	\$ 3,620	\$ 317
Total assets	24,754	4,490	330
Convertible notes (including premium conversion derivative)	—	6,769	810
Total liabilities	4,122	8,917	861
Series A convertible preferred stock	—	7,953	—
Accumulated deficit	(27,059)	(12,392)	(584)
Total stockholders' equity (deficit)	20,632	(12,380)	(531)

ITEM 7 MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion of our financial condition and results of operations should be read in conjunction with the financial statements and notes included in Part II, Item 8 “Financial Statements and Supplementary Data” of this Report.

Overview

We are a clinical-stage biopharmaceutical company focused on developing and commercializing therapies for the treatment of dyslipidemia, a serious medical condition that increases the risk of life threatening cardiovascular disease and nonalcoholic fatty liver disease (NAFLD/NASH). Dyslipidemia is generally characterized by an elevation of

LDL-C, or bad cholesterol, triglycerides, or fat in the blood, as well as inflammation, especially in diabetes patients. We are developing our product candidate gemcabene, 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 VLDLs in the plasma and inhibit the production of fatty acids and cholesterol in the liver. Gemcabene has been tested as monotherapy and in combination with statins and other drugs in 895 subjects, which we define as healthy volunteers and patients, across 18 Phase 1 and Phase 2 clinical trials and has demonstrated promising evidence of efficacy, safety and tolerability.

We are pursuing gemcabene in the following indications as a treatment in addition to maximally tolerated statin therapy for patients who are unable to reach their lipid-lowering goals: HoFH, HeFH, ASCVD, SHTG and NASH. We believe we can design an efficient development plan to provide a new treatment alternative for HoFH patients while demonstrating gemcabene's potential ability to treat patients in the most severe segment of the dyslipidemia market can further enhance brand awareness among key thought leaders and physicians. We are developing in parallel gemcabene for HeFH, ASCVD, SHTG and NASH given gemcabene's: (1) promising clinical data and mechanism in these indications; (2) cost-effective manufacturing process; (3) convenient oral dosing; (4) viability as adjunct combination therapy; and (5) large commercial potential. During 2016, we initiated three late stage clinical trials for gemcabene in HoFH, hypercholesterolemia, including HeFH and ASCVD patients on maximally tolerated statins, and SHTG. By the end of 2017, we expect to report top-line data from all three dyslipidemia trials (COBALT-1, ROYAL-1 and INDIGO-1). We plan to initiate a fourth Phase 2 clinical trial in 2017 to study gemcabene in NASH. Upon completion of one or more of these clinical trials, we intend to request an End of Phase 2 (EOP2) meeting with the FDA to reach an agreement on the design of Phase 3 registration trials and long term safety exposure for our target indications. We intend to pursue similar discussions with Canadian and European health authorities.

Our Company was co-founded in November 2008 as a limited liability company under the name Michigan Life Therapeutics, LLC (MLT) by former Pfizer employees, including Dr. Charles Bisgaier, who were responsible for licensing exclusive worldwide rights to gemcabene from Pfizer in April 2011. In October 2014, we incorporated a new entity under the name Gemphire Therapeutics Inc. in Delaware. In November 2014, we entered into a merger agreement with Gemphire whereby MLT was merged with and into Gemphire, with Gemphire as the surviving entity and all outstanding units of membership interest in MLT were exchanged for shares of common stock of Gemphire. 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.

In April 2016, our board of directors approved an amendment to our certificate of incorporation to effect a 1-for-3.119 reverse stock split (the Reverse Stock Split) for all common and Series A preferred stock. The Reverse Stock Split became effective on April 27, 2016 upon the filing of the amendment to the certificate of incorporation. The authorized shares and par value of the common stock and Series A preferred stock were not adjusted as a result of the Reverse Stock Split.

On August 4, 2016, our Registration Statement on Form S-1 (File No 333-210815) relating to our initial public offering ("IPO") of our common stock was declared effective by the SEC. Pursuant to such Registration Statement, on August 10, 2016, we closed our IPO whereby 3,000,000 shares of our common stock were sold at a public offering price of \$10.00 per share. On September 8, 2016, we closed the sale of 27,755 shares of our common stock at the public offering price of \$10.00 per share, representing a partial exercise of the underwriters' over-allotment option, following which, the IPO terminated. We received net proceeds of approximately \$26.1 million after deducting underwriting discounts and commissions of \$2.1 million and other offering expenses of \$2.1 million.

To date, our primary activities have been conducting research and development activities, planning clinical trials, performing business and financial planning, recruiting personnel and raising capital. We do not have any products approved for sale and have not generated any revenue. We do not expect to generate revenue until, and unless, the FDA or other regulatory authorities approve gemcabene and we successfully commercialize gemcabene. Until such time, if ever, as we can generate substantial product revenue, we expect to finance our cash needs through a combination of equity and debt financings as well as collaborations, strategic alliances and licensing arrangements. Through December 31, 2016, we have funded our operations primarily through the issuance of common stock in our IPO, totaling \$30.3 million in gross proceeds, and the issuance of preferred stock and convertible notes, totaling \$14.8 million in gross proceeds. Our net losses were \$14.6 million, \$9.0 million and \$0.3 million during the years ended December 31, 2016,

2015 and 2014, respectively. As of December 31, 2016, we had an accumulated deficit of \$27.1 million. We anticipate that our expenses will increase substantially as we:

- continue clinical trials for gemcabene and for any other product candidate in our future pipeline;
- seek regulatory approvals for any product candidates that successfully complete clinical trials;
- contract to manufacture our product candidates;
- establish on our own or with partners, a sales, marketing and distribution infrastructure to commercialize any products for which we may obtain regulatory approval;
- maintain, expand and protect our intellectual property portfolio;
- hire additional staff, including clinical, scientific, operational and financial personnel, to execute our business plan;
- add operational, financial and management information systems and personnel, including personnel to support our product development and potential future commercialization efforts; and
- to enable us to operate as a public company.

Our net losses may fluctuate significantly from quarter-to-quarter and year-to-year, depending on the timing of our preclinical studies, clinical trials and our expenditures on other research and development activities.

Recent Developments

On March 10 2017, we entered into a securities purchase agreement for a private placement with a select group of accredited investors 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. The private placement included 56,678 units sold to 3 board members, for aggregate proceeds totaling approximately \$0.5 million and 52,798 units sold to 1 investor who is related to 1 board member, for proceeds totaling approximately \$0.5 million.

The securities were issued and sold in the private placement have not been registered under the Securities Act of 1933, as amended, or state securities laws, and may not be offered or sold in the United States absent registration with the SEC or an applicable exemption from such registration requirements. We have agreed to file a registration statement with the SEC covering the resale of the shares of common stock issued in the private placement and issuable upon exercise of the warrant issued in the private placement.

Financial Operations Overview

Revenue

To date, we have not generated any revenue. We do not expect to generate revenue unless or until we obtain regulatory approval of and commercialize gemcabene. If we fail to complete the development of gemcabene, or any other product candidate we may pursue in the future, in a timely manner, or fail to obtain regulatory approval, our ability to generate future revenue would be compromised.

Operating Expenses

Our operating expenses are classified into three categories: general and administrative, research and development and acquired in-process research and development.

General and Administrative

General and administrative expenses consist primarily of personnel-related costs, including salaries and share-based compensation costs, for personnel in functions not directly associated with research and administrative activities. Other significant costs include legal fees relating to intellectual property and corporate matters and professional fees for accounting and other services. We anticipate that our general and administrative expenses will continue to be higher than comparable periods in the future to support our continued research and development activities, potential commercialization of gemcabene, if approved, and any future product candidates we may develop and the increased costs of operating as a public company. These increases will include increased costs related to the hiring of additional personnel and fees for legal and professional services, significantly increased share-based compensation costs related to stock options issued in conjunction with our IPO and anticipated future option grants in conjunction with personnel additions, as well as other public-company related costs.

Research and Development

To date, our research and development expenses have related primarily to the clinical stage development of gemcabene. Research and development expenses consist of costs incurred in performing research and development activities, including compensation for research and development employees, costs associated with preclinical studies and trials, regulatory activities, manufacturing activities to support clinical activities, license fees, nonlegal patent costs, fees paid to external service providers that conduct certain research and development, clinical costs and an allocation of overhead expenses. Research and development costs are expensed as incurred and costs incurred by third parties are expensed as the contracted work is performed. We accrue for costs incurred as the services are being provided by monitoring the status of the study or project, and the invoices received from our external service providers. We adjust our accrual as actual costs become known. Research and development activities are central to our business model.

We expect that gemcabene will have higher development costs during its later stages of clinical development, as compared to costs incurred during its earlier stages of development, primarily due to the increased size and duration of the later-stage clinical trials, so we expect our research and development expenses to significantly increase in the future as we continue to conduct preclinical studies and clinical trials for gemcabene and potentially develop other product candidates. However, it is difficult to determine with certainty the duration, costs and timing to complete our current or future preclinical programs and clinical trials of gemcabene. The duration, costs and timing of clinical trials and development of gemcabene will depend on a variety of factors that include, but are not limited to, the following:

- per patient trial costs;
- the number of patients that participate in the trials;
- the number of sites included in the trials;
- the countries in which the trials are conducted;
- the length of time required to enroll eligible patients;
- the number of doses that patients receive;
- the drop-out or discontinuation rates of patients;
- potential additional safety monitoring or other studies requested by regulatory agencies;
- the duration of patient follow-up;
- the phase of development of the product candidate;
- arrangements with contract research organizations and other service providers; and
- the efficacy and safety profile of the product candidates.

Acquired In-Process Research and Development

We include costs to acquire or in-license product candidates in acquired in-process research and development expenses. When we acquire the right to develop and commercialize a new product candidate, any up-front payments, or any future milestone payments that relate to the acquisition or licensing of such a right are immediately expensed as acquired in-process research and development in the period in which they are incurred. These costs are immediately expensed provided that the payments do not also represent processes or activities that would constitute a “business” as defined under generally accepted accounting principles in the United States (GAAP), or provided that the product candidate has not achieved regulatory approval for marketing and, and absent obtaining such approval, has no alternative future use. Royalties owed on future sales of any licensed product will be expensed in the period the related revenues are recognized.

Interest Income (Expense)

Interest income (expense) consists of activity related to convertible notes issued by us, activity associated with the underlying premium conversion derivative related to such notes, and interest earnings from cash and cash equivalents. The notes we issued had an annual interest rate of 8%. The interest on the Interim Notes compounded on an annual basis while the interest on the Convertible Notes compounded daily. The principal and accrued and unpaid interest on the Convertible Notes converted into shares of the Company’s Series A preferred stock upon the closing of the Series A preferred stock financing on March 31, 2015, which shares of Series A preferred stock, and accrued dividends thereon, converted into common stock immediately prior to the closing of the IPO. The principal and accrued and unpaid interest on the Interim Notes converted into shares of common stock immediately prior to the closing of the IPO.

We expect to earn interest income in future periods from the investment of cash and cash equivalents and a significant decrease in interest income (expense) given the conversion of the principal and accrued and unpaid interest on both the Convertible Notes and Interim Notes in August 2016.

Loss on convertible note extinguishment

Loss on convertible note extinguishment consists of losses stemming from a convertible note amendment accounted for as note extinguishment.

Other (Expense) Income

Other (expense) income relates to foreign currency exchange gains and losses. Foreign currency exchange gains and losses relate to transactions and monetary asset and liability balances denominated in currencies other than the U.S. dollar. Foreign currency gains and losses may continue to fluctuate in the future due to changes in foreign currency exchange rates.

Results of Operations**Comparison of Years Ended December 31, 2016 and 2015**

The following table summarizes our operating results for the periods indicated:

	For the Year Ended December 31,		
	2016	2015	Change
	(in thousands)		
Operating expenses:			
General and administrative	\$ 5,956	\$ 3,177	\$ 2,779
Research and development	8,740	3,991	4,749
Acquired in-process research and development	—	908	(908)
Total operating expenses	<u>14,696</u>	<u>8,076</u>	<u>6,620</u>
Loss from operations	(14,696)	(8,076)	(6,620)
Interest income (expense)	114	(762)	876
Loss on convertible note extinguishment	—	(198)	198
Other (expense) income	(4)	7	(11)
Loss before income taxes	(14,586)	(9,029)	(5,557)
Provision (benefit) for income taxes	—	—	—
Net loss	<u>\$ (14,586)</u>	<u>\$ (9,029)</u>	<u>\$ (5,557)</u>

General and Administrative

General and administrative expenses for the year ended December 31, 2016 were \$6.0 million compared to \$3.2 million for the year ended December 31, 2015. The \$2.8 million increase was primarily attributable to an increase in staffing and professional services associated largely with supporting our clinical trials and becoming a public company in 2016. General and administrative expenses included \$1.2 million and \$0.3 million in share-based compensation expense during the year ended December 31, 2016 and 2015, respectively.

Research and Development

Research and development expenses for the year ended December 31, 2016 were \$8.7 million compared to \$4.0 million for the year ended December 31, 2015. The \$4.7 million increase was primarily attributable to increased staffing and fees paid to external service providers for clinical trial development, regulatory consulting, preclinical studies and manufacturing activities to support clinical advancement of gemcabene. Research and development expenses included \$0.6 million in share-based compensation expense during the year ended December 31, 2016. There was no share-based compensation expense during the year ended December 31, 2015.

Acquired In-process Research and Development

No acquired in-process research and development expenses were incurred during the year ended December 31, 2016. Acquired in-process research and development expenses during the year ended December 31, 2015 were \$0.9 million which was the result of an equity milestone payment under our license agreement with Pfizer. We issued 675,250 shares of common stock to Pfizer and immediately expensed the equity milestone payment in the first quarter of 2015 as acquired in-process research and development expenses at the fair value equivalent of the shares issued in the amount of \$0.9 million.

Interest Income (Expense)

Interest income (expense) for the year ended December 31, 2016 was \$0.1 million compared to \$(0.8) million for the year ended December 31, 2015. The \$0.9 million increase in net interest income, primarily non-cash, was largely due to the amortization of the note premium associated with the July 2015 Interim Notes, fair value adjustments of the derivative liability associated with the Interim Notes, and interest earnings of \$23,000 from IPO cash proceeds. Interest income was offset in part by non-cash interest expense associated with the conversion of the April 2016 Interim Notes

along with the amortization of the underlying beneficial conversion feature. The unpaid principal and accrued interest on the Convertible Notes converted into shares of Series A preferred stock on March 31, 2015 and no Convertible Notes were outstanding following such date. The principal and accrued and unpaid interest on the Interim Notes converted to common stock immediately prior to the closing of the IPO, and as a result, no Interim Notes were outstanding as of December 31, 2016.

Loss on convertible note extinguishment

Non-cash loss on convertible note extinguishment for the years ended December 31, 2016 and 2015 was zero and \$0.2 million, respectively. The convertible notes issued in July 2015 were amended in December 2015. The amendment added a new contingent conversion feature, serving to extend the maturity date by five months and revise certain conversion premiums. As a result of the modifications made to such convertible notes, we accounted for the amendment as a note extinguishment which gave rise to the \$0.2 million non-cash loss in 2015. During the year ended 2016, there were no modifications to convertible notes that required note extinguishment accounting treatment.

Provision for Income Taxes

Provision for income taxes consists of federal and state income taxes in the United States, as well as deferred income taxes and changes in related valuation allowance reflecting the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Currently, there is no provision for income taxes, as we have incurred operating losses to date, and a full valuation allowance has been provided on the net deferred tax assets as of December 31, 2016 and December 31, 2015.

Comparison of the Years Ended December 31, 2015 and 2014

The following table summarizes our operating results for the periods indicated:

	For the Year Ended December 31,		
	2015	2014	Change
	(in thousands)		
Operating expenses:			
General and administrative	\$ 3,177	\$ 214	\$ 2,963
Research and development	3,991	52	3,939
Acquired in-process research and development	908	—	908
Total operating expenses	<u>8,076</u>	<u>266</u>	<u>7,810</u>
Loss from operations	(8,076)	(266)	(7,810)
Interest expense	(762)	(55)	(707)
Loss on convertible note extinguishment	(198)	—	(198)
Other income	7	1	6
Loss before income taxes	(9,029)	(320)	(8,709)
Provision (benefit) for income taxes	—	—	—
Net loss	<u>\$ (9,029)</u>	<u>\$ (320)</u>	<u>\$ (8,709)</u>

General and Administrative

General and administrative expenses for the year ended December 31, 2015 were \$3.2 million compared to \$0.2 million for the year ended December 31, 2014. The \$3.0 million increase was primarily attributable to an increase in staffing and professional services. General and administrative expenses included \$0.3 million and \$53,000 in share-based compensation expense in the years ended December 31, 2015 and 2014, respectively.

Research and Development

Research and development expenses for the year ended December 31, 2015 were \$4.0 million compared to \$52,000 for the year ended December 31, 2014. The \$3.9 million increase was primarily attributable to preclinical studies and manufacturing activities to support clinical advancement of gemcabene and fees paid to external service providers for clinical trial development and regulatory consulting.

Acquired In-process Research and Development

Acquired in-process research and development expenses for the year ended December 31, 2015 were \$0.9 million. There were no acquired in-process research and development expenses during the year ended December 31, 2014. The increase was attributable to an equity milestone payment under our license agreement with Pfizer. We issued 675,250 shares of common stock to Pfizer and immediately expensed the equity milestone payment in the first quarter of 2015 as acquired in-process research and development expenses at the fair value equivalent of the shares issued in the amount of \$0.9 million.

Interest Expense

Non-cash interest expense for the year ended December 31, 2015 was \$0.8 million compared to \$55,000 for the year ended December 31, 2014. The \$0.7 million increase was primarily due to the issuance of convertible notes in the first, third and fourth quarters of 2015. Cash interest paid during the years ended December 31, 2015 and 2014 was \$2,000 and zero, respectively. The convertible notes issued through the first quarter of 2015 were converted to Series A preferred shares on March 31, 2015. The convertible notes issued in July and December 2015 were outstanding at December 31, 2015.

Loss on convertible note extinguishment

Non-cash loss on convertible note extinguishment for the years ended December 31, 2015 and 2014 was \$0.2 million and zero, respectively. The convertible notes issued in July 2015 were amended in December 2015. The amendment added a new contingent conversion feature, serving to extend the maturity date by five months and revise certain conversion premiums. As a result of the modifications made to such convertible notes, we accounted for the amendment as a note extinguishment which gave rise to the \$0.2 million non-cash loss in 2015.

Provision for Income Taxes

Provision for income taxes consists of federal and state income taxes in the United States, as well as deferred income taxes and changes in related valuation allowance reflecting the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Currently, there is no provision for income taxes, as we have incurred operating losses to date, and a full valuation allowance has been provided on the net deferred tax assets as of December 31, 2015 and December 31, 2014.

Liquidity and Capital Resources

Capital Resources

As of December 31, 2016, our principal sources of liquidity consisted of cash and cash equivalents of approximately \$24.0 million. Our cash and cash equivalents are invested in cash deposits and money market accounts.

We have not generated any revenue, and we anticipate that we will continue to incur losses for the foreseeable future.

We anticipate that our expenses will increase substantially as we:

- continue clinical trials for gemcabene and for any other product candidate in our future pipeline;
- seek regulatory approvals for any product candidates that successfully complete clinical trials;
- contract to manufacture our product candidates;
- establish on our own or with partners, a sales, marketing and distribution infrastructure to commercialize any products for which we may obtain regulatory approval;
- maintain, expand and protect our intellectual property portfolio;

- hire additional staff, including clinical, scientific, operational and financial personnel, to execute our business plan;
- add operational, financial and management information systems and personnel, including personnel to support our product development and potential future commercialization efforts; and
- to enable us to operate as a public company.

Historical Capital Resources

On August 4, 2016, our Registration Statement on Form S-1 (File No 333-210815) relating to our IPO of our common stock was declared effective by the SEC. Pursuant to such Registration Statement, on August 10, 2016, we closed our IPO whereby 3,000,000 shares of our common stock were sold at a public offering price of \$10.00 per share. On September 8, 2016, we closed the sale of 27,755 shares of our common stock at the public offering price of \$10.00 per share, representing a partial exercise of the underwriters' over-allotment option, following which, the IPO terminated. We received net proceeds of approximately \$26.1 million after deducting underwriting discounts and commissions of \$2.1 million and other offering expenses of \$2.1 million.

Our primary source of cash prior to the IPO was proceeds from the issuance of preferred stock and from the issuance of convertible notes and promissory notes described below. The proceeds from the issuances of preferred stock and from the issuances of the convertible and promissory notes have been used to fund our operations.

From March 2009 through October 2014, we issued promissory notes for aggregate net proceeds of \$0.3 million. The promissory notes compounded at an 8% rate per annum basis and were exchanged for the convertible notes described below on November 1, 2014.

From November 2014 through February 2015, we issued convertible notes for aggregate net proceeds of \$2.4 million (the "Convertible Notes"). The Convertible Notes converted into shares of the Company's Series A preferred stock upon close of the Series A preferred stock financing on March 31, 2015. The conversion equaled 125% of the unpaid principal plus unpaid accrued interest on the Convertible Notes.

In March 2015, we issued Series A convertible preferred stock for aggregate net proceeds of approximately \$1.5 million. On August 10, 2016, immediately prior to the closing of the IPO, the Company's Series A preferred stock, together with accrued dividends thereon, converted into 827,205 shares of common stock.

In July and December 2015, we entered into convertible note financings in which we issued 8% convertible notes in an aggregate principal amount of \$5.5 million to various investors. In February and April 2016, we issued additional 8% convertible notes in an aggregate principal amount of \$5.2 million to various investors (collectively with the July and December 2015 notes, the "Interim Notes"). The principal and accrued and unpaid interest on the Interim Notes converted into shares of common stock immediately prior to the closing of the IPO.

The following table summarizes our cash flows for the periods indicated:

	For the Year Ended		
	December 31,		
	2016	2015	2014
	(in thousands)		
Net cash used in operating activities	\$ (11,043)	\$ (5,433)	\$ (195)
Net cash provided by (used in) investing activities	—	—	—
Net cash provided by financing activities	31,456	8,736	509
Net increase in cash	<u>\$ 20,413</u>	<u>\$ 3,303</u>	<u>\$ 314</u>

Cash Flow from Operating Activities

For the year ended December 31, 2016, cash used in operating activities of \$11.0 million was attributable to a net loss of \$14.6 million which included \$1.6 million in non-cash expenses and a net change of \$1.9 million in our net operating assets and liabilities. The non-cash (income) expenses consisted of \$1.7 million of share-based compensation offset by

net non-cash interest income of \$(0.1) million related to both the Interim Notes and the premium conversion derivative. The net change in operating assets and liabilities was primarily attributable to increases in our accounts payable and accrued liabilities associated with our increased operating expenses and a net decrease in our deferred offering costs following the completion of our IPO.

For the year ended December 31, 2015, cash used in operating activities of \$5.4 million was attributable to a net loss of \$9.0 million, partially offset by \$2.2 million in non-cash expenses and a net change of \$1.4 million in our net operating assets and liabilities. The non-cash expenses consist of \$0.3 million of share-based compensation, non-cash interest of \$0.8 million related to both the convertible notes and to the premium conversion derivative, \$0.9 million related to a non-cash purchase of acquired in-process research and development pursuant to the issuance of common stock and \$0.2 million related to a non-cash loss on extinguishment of convertible notes. The change in operating assets and liabilities was attributable to increases in accounts payable and accrued liabilities associated with our increased operating expenses.

For the year ended December 31, 2014, cash used in operating activities of \$0.2 million was attributable to a net loss of \$0.3 million, partially offset by \$108,000 in non-cash expenses and a net change of \$17,000 in our net operating assets and liabilities. The non-cash expenses consisted of \$53,000 of share-based compensation and non-cash interest of \$55,000 related to both the convertible notes and to the premium conversion derivative. The change in operating assets and liabilities was primarily attributable to increases in accrued liabilities associated with our increased operating expenses.

Cash Flow from Investing Activities

There were no sources or uses of funds from investing activities for all periods presented.

Cash Flow from Financing Activities

Net cash provided by financing activities during the year ended December 31, 2016 was \$31.5 million consisting of \$26.3 million in IPO proceeds, net of discounts, commissions and other offering costs of \$4.0 million paid through December 31, 2016, and \$5.2 million in proceeds from the issuance of Interim Notes in February 2016 and April 2016.

Net cash provided by financing activities was \$8.7 million during the year ended December 31, 2015. Net cash provided by financing activities during the year ended December 31, 2015 consisted of \$1.5 million in proceeds from the issuance of Series A preferred stock and \$7.4 million in proceeds from the issuance of Convertible Notes and Interim Notes, offset by financing costs of \$0.2 million associated with the proposed initial public offering.

Net cash provided by financing activities during the year ended December 31, 2014 was \$0.5 million, consisting of \$0.4 million in proceeds from the issuance of Convertible Notes and \$0.1 million in proceeds received from the issuance of promissory notes.

Liquidity and Capital Resource Requirements

We have no current source of revenue to sustain our present activities, and we do not expect to generate revenue until, and unless, the FDA or other regulatory authorities approve gemcabene and we successfully commercialize gemcabene. Until such time, if ever, as we can generate substantial product revenue, we expect to finance our cash needs through a combination of equity and debt financings as well as collaborations, strategic alliances and licensing arrangements. We do not have any committed external source of funds. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interest of our stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through collaborations, strategic alliances or licensing arrangements with pharmaceutical partners, we may have to relinquish valuable rights to our technologies, future revenue streams or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings or through collaborations, strategic alliances or licensing arrangements when needed, we may be required to delay, limit, reduce or terminate our product development, future commercialization efforts, or grant rights to develop and market gemcabene that we would otherwise prefer to develop and market ourselves.

We believe the \$24.0 million cash on hand at December 31, 2016, together with the net proceeds from the private completed on March 15, 2017 will be sufficient to fund our operations through completion of all three of the dyslipidemia Phase2b studies in 2017 as well as completion of the AZURE-1 study in the second half of 2018. The development of gemcabene is subject to numerous uncertainties, and we have based these estimates on assumptions that may prove to be substantially different than we currently anticipate and could use our cash resources sooner than we expect. Additionally, the process of advancing early-stage product candidates and testing product candidates in clinical trials is costly, and the timing of progress in these clinical trials is uncertain. Our ability to successfully transition to profitability will be dependent upon achieving a level of product sales adequate to support our cost structure. We cannot assure that we will ever be profitable or generate positive cash flow from operating activities.

Furthermore, we will need to raise additional capital to continue to fund the further development of gemcabene and other potential product candidates, our operations, and commercialization of gemcabene and other potential product candidates, if approved.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations as of December 31, 2016, which represent material expected or contractually committed future obligations.

	Payments Due by Period				Total
	Less than 1 year	1-3 Years	3-5 Years	More than 5 years	
Facility lease	\$ 101	\$ 159	\$ —	\$ —	\$ 260
Total	\$ 101	\$ 159	\$ —	\$ —	\$ 260

In May 2016, we entered into a 3 year non-cancellable facility lease commencing August 1, 2016 and made an initial payment of approximately \$91,000, \$75,000 of which is treated as prepaid rent. The initial term of the agreement is three years with an initial monthly base rent of approximately \$8,400. Additionally, in the course of our normal operations, we have entered into cancellable purchase commitments with our suppliers for various key research and clinical services and raw materials. The purchase commitments covered by these arrangements are subject to change based on our research and development efforts.

In April 2011, we entered into a license agreement with Pfizer (the Pfizer Agreement) for a worldwide exclusive license to certain patent rights to make, use, sell, offer for sale and import the clinical product candidate gemcabene. In exchange for this license, we agreed to issue shares of our common stock to Pfizer representing 15% of our fully diluted capital at the close of our first arms-length Series A financing, which occurred in March 2015.

We agreed to make milestone payments totaling up to \$37 million upon the achievement of certain milestones, including the first regulatory submission in any country, regulatory approval in each of the United States, Europe and Japan, the first anniversary of the first regulatory approval in any country, and upon achieving certain aggregate sales levels of gemcabene or any product containing gemcabene. Future milestone payments under the Pfizer Agreement, if any, are not expected to begin for at least several years and extend over a number of subsequent years.

We have also agreed to pay Pfizer tiered royalties on a country-by-country basis based upon the annual amount of net sales as specified in the Pfizer Agreement until expiration of the last valid claim of the licensed patent rights, including any patent term extensions or supplemental protection certificates. The royalty rates range from the high single digits to the low teens depending on the level of net sales. Under the Pfizer Agreement we are obligated to use commercially reasonable efforts to develop and commercialize gemcabene.

The Pfizer Agreement will expire upon expiration of the last royalty term. Either party may terminate the Pfizer Agreement for the other party's uncured material breach and specified bankruptcy events. Pfizer may terminate the Pfizer Agreement if we or any of our sublicensees challenge the validity, enforceability or ownership of the licensed patents. Upon termination of the license agreement for cause by Pfizer, we must grant Pfizer a non-exclusive license to use any intellectual property rights arising from the development or commercialization of gemcabene. Additionally, Pfizer may revoke the license if we are unable to adequately commercialize gemcabene by April 2021.

Pfizer has a non-exclusive, sub licensable, royalty-free right and license for non-commercial research or development purposes to intellectual property rights relating to gemcabene that are developed by us after the effective date of the license with Pfizer.

As of December 31, 2016, no obligations were recorded related to the Pfizer Agreement due to the inability to reasonably estimate the timing and outcomes of the gemcabene trials as well as the timing and amounts of future sales of gemcabene, if any.

Critical Accounting Policies and Estimates

Our financial statements are prepared in accordance with GAAP. These accounting principles require us to make estimates and judgments that can affect the reported amounts of assets and liabilities as of the date of the financial statements as well as the reported amounts of revenue and expense during the periods presented. We believe that the estimates and judgments upon which we rely are reasonably based upon information available to us at the time that we make these estimates and judgments. To the extent that there are material differences between these estimates and actual results, our financial results will be affected. The accounting policies that reflect our more significant estimates and judgments and which we believe are the most critical to aid in fully understanding and evaluating our reported financial results are described below.

The following is not intended to be a comprehensive list of all of our accounting policies or estimates. Our accounting policies are more fully described in Note 2 — *Summary of Significant Accounting Policies*, included in “Item 8 — Financial Statements and Supplementary Data” in this report.

Income Taxes

We utilize the liability method of accounting for income taxes as required by Accounting Standards Codification (ASC) 740, *Income Taxes*. Under this method, deferred tax assets and liabilities are determined based on differences between financial reporting and the tax basis of assets and liabilities and are measured using enacted tax rates and laws that will be in effect when the differences are expected to reverse. Currently, there is no provision for income taxes, as we have incurred operating losses to date, and a full valuation allowance has been provided on the net deferred tax assets. MLT was treated as a partnership for federal and state income tax purposes. Accordingly, no provision was made for income taxes for periods prior to October 30, 2014, since the net losses incurred up to that time (subject to certain limitations) was passed through to the income tax returns of its members. Upon incorporation on October 30, 2014 we became taxable as a corporation.

Since incorporation, we have filed U.S. federal and Michigan state income tax returns. Our deferred tax assets were primarily comprised of federal and state tax net operating loss carryforwards, acquired intangibles and tax credit carryforwards and were recorded using enacted tax rates expected to be in effect in the years in which these temporary differences are expected to be utilized. As of December 31, 2016, the tax effect of our federal and state net operating loss carryforwards was approximately \$2.1 million and \$0.2 million, respectively, and our federal and state research and development credit carryforwards were \$0.7 million and \$24,000, respectively. As of December 31, 2015, the tax effect of our federal and state net operating loss carryforwards was approximately \$2.4 million and \$0.3 million, respectively, and our federal research and development credit carryforward was \$95,000. We did not have any state research and development credit carryforwards in 2015. The federal net operating loss and tax credit carryforwards will begin to expire in 2034 if not utilized. The state net operating loss carryforwards will begin to expire in 2026 if not utilized.

Utilization of the net operating loss and tax credit carryforwards may be subject to an annual limitation due to historical or future ownership percentage change rules provided by the Internal Revenue Code of 1986, as amended, and similar state provisions. The annual limitation may result in the expiration of certain net operating loss and tax credit carryforwards before their utilization. However, due to uncertainties surrounding our ability to generate future taxable income to realize these tax assets, a full valuation allowance has been established to offset our deferred tax assets.

Convertible Preferred Stock

We initially record preferred stock that may be redeemed at the option of the holder, or based on the occurrence of events outside our control, in mezzanine equity at the value of the proceeds received. Subsequently, if it is probable that the preferred stock will become redeemable, we recognize changes in the redemption value immediately as they occur

and adjust the carrying amount of the instrument to equal the redemption value at the end of each reporting period. If it is not probable that the preferred stock will become redeemable, we do not adjust the carrying value. In the absence of retained earnings these charges are recorded against additional paid-in-capital, if any, and then to accumulated deficit. Since the conversion of the Series A preferred stock into shares of common stock in August 2016 upon the closing of the IPO, there was no convertible preferred stock issued.

Share-Based Compensation

Our share-based compensation for share-based awards is accounted for in accordance with authoritative guidance and is estimated at the grant date based on the fair value of the award and recognized as expense ratably over the requisite vesting period of the award. Determining the appropriate fair value of share-based awards requires judgment. We calculate the fair value of each award to employees on the date of grant based on the fair value of our common stock. See “— Common Stock Valuation” below.

We calculate the fair value of each stock option award to employees on the date of grant under the Black-Scholes option-pricing model using certain assumptions related to the fair value of our common stock, the option’s expected term, our expected stock price volatility, risk free interest rates and our expected dividend rate.

For options to purchase common stock issued to non-employees, including consultants, we record share-based compensation based on the fair value of the options. We calculate the fair value of each share-based award to non-employees on each measurement date based on the fair value of our common stock. The fair value of options granted to non-employees is remeasured as the options vest and is recognized in the statements of operations during the period the related services are rendered.

The fair value of each stock option grant was determined using the methods and assumptions discussed below. Each of these inputs is subjective and generally requires significant judgment and estimation by management.

- *Fair Value of Common Stock.* As discussed below in “— Common Stock Valuation,” because there was no public market for our common stock prior to our IPO, our board of directors has determined the fair value of the common stock by considering a number of objective and subjective factors, including based on contemporaneous valuations of our common stock performed by an unrelated valuation specialist. Currently, the fair value of our common stock is based on the quoted market price.
- *Expected Term.* The expected term represents the period that share-based awards are expected to be outstanding. The expected term for option grants is determined using the simplified method. The simplified method deems the term to be the average of the time-to-vesting and the contractual life of the share-based awards. The expected term for options issued to nonemployees is the contractual term.
- *Expected Volatility.* Since we do not have a trading history of our common stock, the expected volatility was derived from the historical stock volatilities of comparable peer public companies within our industry that we consider to be comparable to our business over a period equivalent to the expected term of the share-based awards.
- *Risk-Free Interest Rate.* The risk-free interest rate is based on the U.S. Treasury yield curve in effect at the date of grant for zero-coupon U.S. Treasury notes with maturities approximately equal to the share-based awards’ expected term.
- *Expected Dividend Rate.* The expected dividend is zero as we have not paid and do not anticipate paying any dividends on our common stock for the foreseeable future.

The estimated grant-date fair value of our share-based awards was calculated using Black-Scholes option-pricing model, based on the following assumptions for the following periods presented:

	Year Ended December 31,		
	2016	2015	2014
Expected stock price volatility	71.4 %	71.0 %	— %
Expected life of options (years)	6.0	5.5	—
Expected dividend yield	0 %	0 %	— %
Risk free interest rate	1.2 %	1.7 %	— %

If any of the assumptions used in the Black-Scholes option-pricing model change significantly, share-based compensation for future awards may differ materially compared with the awards granted previously.

For 2016, 2015 and 2014, share-based compensation was \$1.7 million, \$0.3 million and \$53,000, respectively. As of December 31, we had unrecognized share-based compensation expense totaling \$11.2 million.

Common Stock Valuation

During periods when there was an absence of a public trading market for our common stock prior to the IPO, on each grant date, we developed an estimate of the fair value of our common stock in order to determine an exercise price for each share-based award. We determined the fair value of our common stock using methodologies, approaches and assumptions consistent with the *American Institute of Certified Public Accountants Practice Aid, Valuation of Privately-Held-Company Equity Securities Issued as Compensation*. Our board of directors exercised reasonable judgment and considered a number of objective and subjective factors to determine the best estimate of the fair value of our common stock, including having contemporaneous and retrospective valuations of our common stock performed by an unrelated valuation specialist, valuations of comparable securities transactions, sales of our convertible preferred stock to unrelated third parties, the rights, preferences and privileges of our common stock versus our preferred stock, our operating and financial performance, our stage of development, current business conditions, our projections, business developments, the lack of liquidity of our capital stock and general and industry specific economic outlook.

For our common stock valuations performed from November 1, 2014 up until the issuance of our Series A convertible preferred stock (the Series A preferred stock) in March 2015, the fair value of our common stock was estimated entirely using a hybrid of two market approaches, specifically a proposed Series A preferred stock *Securities Transaction — Backsolve* method and the Series A preferred stock post-money value. This later approach considers the implied equity value based on a common equivalent capitalization table associated with an IPO exit.

Once the Series A preferred stock round was consummated in March 2015, common stock valuations began to rely on the indications of value realized in the transaction through June 30, 2015. The fair value of our common stock was estimated using a hybrid of two market approaches, specifically the realized Series A preferred stock *Recent Securities Transaction — Backsolve* method and the Series A preferred stock post-money value. This later approach considers our implied equity value based on a common equivalent capitalization table associated with an IPO exit.

During the third quarter of 2015, the fair value of our common stock was estimated using a hybrid of two market approaches, specifically the value of a potential Series B convertible preferred stock financing utilizing a *Proposed Securities Transaction — Backsolve* method and the value of a potential Series B financing post-money as a common stock equivalent for an IPO exit. Lastly, the completed Series A preferred stock *Recent Securities Transaction — Backsolve* method was considered in the event that a Series B convertible preferred stock financing or an IPO could not be achieved.

Beginning in the fourth quarter of 2015 and up until the closing of the IPO, the fair value of our common stock was estimated using a hybrid of two market approaches, specifically the value of a potential Series B convertible preferred stock financing utilizing a *Proposed Securities Transaction — Backsolve* method and a pre-money IPO value for an IPO exit. Lastly, the completed Series A preferred stock *Recent Securities Transaction — Backsolve* method was considered in the event that a Series B convertible preferred stock financing or an IPO could not be achieved.

We considered the various methods for allocating the enterprise value across our classes and series of capital stock to determine the fair value of our common stock at each valuation date. The methods we used consisted of the following:

- *Option pricing method (OPM)*. Under the option pricing method, shares are valued by creating a series of call options with exercise prices based on the liquidation preferences and conversion terms of each equity class. The values of the preferred and common stock are inferred by analyzing these options.
- *Probability-weighted expected return method (PWERM)*. The PWERM is a scenario-based analysis that estimates the value per share based on the probability-weighted present value of expected future investment returns, considering each of the possible outcomes available to us, as well as the economic and control rights of each share class.

Our per share common stock value was estimated by allocating the equity value using a hybrid combination of OPM and PWERM. We used either PWERM or a combination of the OPM and the PWERM as described above to allocate the equity value to each element of our capital structure, including our common stock. For both approaches, we applied a discount to the valuations due to the lack of marketability of the ordinary shares. We calculated the discount for lack of marketability using a Finnerly model and applied it as appropriate to each allocation.

The dates of our valuations did not always coincide with the dates of our option grants. In such instances, management's estimates were based on the most recent valuation of shares of our common stock. For grants occurring between valuation dates, for financial reporting purposes, we considered the preceding valuations and our assessment of additional objective and subjective factors we believed were relevant as of the grant date to determine the fair value of our common stock.

Related Party Transactions

See Note 14 — “*Related Party Transactions*” and Note 4 — “*Debt*” included in “Item 8 — Financial Statements and Supplementary Data” in this Report regarding the impact of certain related party transactions with respect to facility rent and financing activity related to the issuance of our various note instruments and convertible Series A preferred stock prior to the close of the IPO.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements as defined under the rules and regulations of the SEC.

Recent Accounting Pronouncements

See Note 2 — “*Summary of Significant Accounting Policies*” included in “Item 8 — Financial Statements and Supplementary Data” in this Report regarding the impact of certain recent accounting pronouncements on our financial statements.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

The market risk inherent in our financial instruments and in our financial position is the potential loss arising from adverse changes in interest rates. As of December 31, 2016, we had cash and cash equivalents of \$24.0 million. We generally hold our excess cash in interest-bearing money market accounts. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates. Due to the short-term maturities of our cash equivalents and the low risk profile of our investments, an immediate 100 basis point change in interest rates would not have a material effect on the fair market value of our cash equivalents.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

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Report of Independent Registered Public Accounting Firm

The Board of Directors and Shareholders
Gemphire Therapeutics Inc.

We have audited the accompanying balance sheets of Gemphire Therapeutics Inc. (formerly known as Michigan Life Therapeutics, LLC) (the Company) as of December 31, 2016 and 2015, and the related statements of comprehensive loss, changes in convertible preferred stock and stockholders' and members' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2016. Our audits also included the financial statement schedule included in Item 15(a)(2). These financial statements and schedule are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements and schedule based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. We were not engaged to perform an audit of the Company's internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Gemphire Therapeutics Inc. (formerly known as Michigan Life Therapeutics, LLC) at December 31, 2016 and 2015, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2016, in conformity with U.S. generally accepted accounting principles. Also in our opinion, the related financial statement schedule, when considered in relation to the basic financial statements taken as a whole, presents fairly in all material respects the information set forth therein.

/s/ Ernst & Young LLP
Detroit, Michigan
March 20, 2017

Gemphire Therapeutics Inc.
(Formerly Known as Michigan Life Therapeutics, LLC)
Balance Sheets
(in thousands, except share amounts and par value)

	<u>December 31,</u> <u>2016</u>	<u>December 31,</u> <u>2015</u>
Assets		
Current assets:		
Cash and cash equivalents	\$ 24,033	\$ 3,620
Prepaid expenses	713	23
Total current assets	24,746	3,643
Deferred offering costs	—	847
Deposits	8	—
Total assets	\$ 24,754	\$ 4,490
Liabilities, convertible preferred stock and stockholders' equity (deficit)		
Current liabilities:		
Accounts payable	\$ 2,008	\$ 531
Accrued liabilities	2,113	1,617
Convertible notes to related parties	—	1,795
Convertible notes	—	4,629
Premium conversion derivative	—	345
Total current liabilities	4,121	8,917
Other liabilities	1	—
Total liabilities	4,122	8,917
Commitments and contingencies (Note 5)		
Series A convertible preferred stock, \$0.001 par value; no shares authorized as of December 31, 2016 and 2,325,581 shares authorized as of December 31, 2015, no shares issued or outstanding as of December 31, 2016 and 745,637 shares issued and outstanding as of December 31, 2015, aggregate liquidation preference as of December 31, 2016 and 2015 of zero and \$7,953, respectively.		
	—	7,953
Stockholders' equity (deficit):		
Preferred stock, \$0.001 par value; 10,000,000 shares authorized as of December 31, 2016 and no shares authorized as of December 31, 2015, no shares issued or outstanding as of December 31, 2016 and 2015.		
	—	—
Common stock, \$0.001 par value; 100,000,000 and 17,674,419 shares authorized as of December 31, 2016 and 2015, respectively, 9,270,255 and 3,758,488 shares issued and outstanding at December 31, 2016 and 2015, respectively.		
	17	12
Additional paid-in capital	47,674	—
Accumulated deficit	(27,059)	(12,392)
Total stockholders' equity (deficit)	20,632	(12,380)
Total liabilities, convertible preferred stock and stockholders' equity (deficit)	\$ 24,754	\$ 4,490

See accompanying notes.

Gemphire Therapeutics Inc.
(Formerly Known as Michigan Life Therapeutics, LLC)
Statements of Comprehensive Loss
(in thousands, except share and per share amounts)

	Year Ended December 31,		
	2016	2015	2014
Operating expenses:			
General and administrative	\$ 5,956	\$ 3,177	\$ 214
Research and development	8,740	3,991	52
Acquired in-process research and development	—	908	—
Total operating expenses	14,696	8,076	266
Loss from operations	(14,696)	(8,076)	(266)
Interest income (expense)	114	(762)	(55)
Loss on convertible note extinguishment	—	(198)	—
Other (expense) income	(4)	7	1
Loss before income taxes	(14,586)	(9,029)	(320)
Provision (benefit) for income taxes	—	—	—
Net loss	(14,586)	(9,029)	(320)
Other comprehensive loss, net of tax	—	—	—
Comprehensive loss	\$ (14,586)	\$ (9,029)	\$ (320)
Net loss	\$ (14,586)	\$ (9,029)	\$ (320)
Adjustment to redemption value on Series A convertible preferred stock Premium upon substantial modification of convertible notes with certain stockholders	(366)	(2,968)	—
	—	(1,047)	—
Net loss attributable to common stockholders	\$ (14,952)	\$ (13,044)	\$ (320)
Net loss per share:			
Basic and diluted (Note 10)	\$ (2.57)	\$ (4.54)	\$ (0.21)
Number of shares used in per share calculations:			
Basic and diluted	5,809,396	2,875,053	1,521,703

See accompanying notes.

Gemphire Therapeutics Inc.
(Formerly Known as Michigan Life Therapeutics, LLC)
Statements of Changes in Convertible Preferred Stock and Stockholders' and Members' Equity (Deficit)
(in thousands, except share amounts)

	Series A Convertible Preferred Stock		Members' Deficit	Common Stock		Additional Paid-In Capital	Accumulated Deficit	Total Equity (Deficit)
	Shares	Amount		Shares	Amount			
Balance at January 1, 2014	—	\$ —	\$ (264)	—	\$ —	\$ —	\$ —	\$ (264)
Net loss prior to merger	—	—	(124)	—	—	—	—	(124)
Effect of merger	—	—	388	1,987,817	6	(6)	(388)	—
Restriction of initial common stock issuances	—	—	—	(556,589)	(2)	2	—	—
Issuance of restricted stock awards	—	—	—	1,605,008	5	(5)	—	—
Share-based compensation — employee	—	—	—	—	—	53	—	53
Net loss post-merger	—	—	—	—	—	—	(196)	(196)
Balance at December 31, 2014	—	—	—	3,036,236	9	44	(584)	(531)
Issuance of convertible Series A preferred stock, net of issuance costs	745,637	4,985	—	—	—	—	—	—
Redemption value adjustment — Series A preferred stock	—	2,968	—	—	—	(1,130)	(1,838)	(2,968)
Issuance of common stock	—	—	—	677,685	3	908	—	911
Convertible note extinguishment loss	—	—	—	—	—	(106)	(941)	(1,047)
Issuance of restricted stock awards	—	—	—	44,567	—	—	—	—
Share-based compensation — employee	—	—	—	—	—	131	—	131
Share-based compensation — non-employee	—	—	—	—	—	153	—	153
Net loss	—	—	—	—	—	—	(9,029)	(9,029)
Balance at December 31, 2015	745,637	7,953	—	3,758,488	12	—	(12,392)	(12,380)
Redemption value adjustment — Series A preferred stock	—	366	—	—	—	(285)	(81)	(366)
Conversion of Series A preferred stock to common stock	(745,637)	(8,319)	—	827,205	1	8,318	—	8,319
Separation of convertible note beneficial conversion feature upon contingency resolution	—	—	—	—	—	372	—	372
Conversion of convertible notes to common stock	—	—	—	1,656,807	1	11,444	—	11,445
Issuance of common stock from offering	—	—	—	3,027,755	3	30,275	—	30,278
Issuance costs of offering	—	—	—	—	—	(4,168)	—	(4,168)
Share-based compensation — employee	—	—	—	—	—	1,498	—	1,498
Share-based compensation — non-employee	—	—	—	—	—	220	—	220
Net loss	—	—	—	—	—	—	(14,586)	(14,586)
Balance at December 31, 2016	—	\$ —	\$ —	9,270,255	\$ 17	\$ 47,674	\$ (27,059)	\$ 20,632

See accompanying notes.

Gemphire Therapeutics Inc.
(Formerly Known as Michigan Life Therapeutics, LLC)
Statements of Cash Flows
(in thousands)

	For the Year Ended December 31,		
	2016	2015	2014
Operating activities			
Net loss	\$ (14,586)	\$ (9,029)	\$ (320)
Adjustments to reconcile net loss to net cash used in operating activities:			
Share-based compensation	1,718	284	53
Non-cash interest on promissory notes to related parties	—	—	19
Non-cash interest on convertible notes to related parties	145	40	5
Non-cash interest on convertible notes	256	100	1
Non-cash discount amortization on convertible notes to related parties	(17)	62	7
Non-cash discount amortization on convertible notes	(276)	261	5
Revaluation of premium conversion derivative	(850)	297	18
Non-cash loss on extinguishment of convertible notes	—	198	—
Non-cash interest upon conversion of convertible notes	649	—	—
Non-cash acquisition of in-process research and development	—	908	—
Change in assets and liabilities:			
Prepaid expenses and other assets	(55)	(10)	2
Accounts payable	1,477	444	(6)
Accrued and other liabilities	496	1,012	21
Net cash used in operating activities	<u>(11,043)</u>	<u>(5,433)</u>	<u>(195)</u>
Investing activities			
Net cash provided by (used in) investing activities	<u>—</u>	<u>—</u>	<u>—</u>
Financing activities			
Proceeds from issuance of convertible notes	2,651	5,560	390
Proceeds from issuance of convertible notes to related parties	2,500	1,856	25
Issuance costs related to convertible notes	(10)	—	—
Proceeds from issuance of promissory notes to related parties	—	—	94
Proceeds from issuance of Series A convertible preferred stock	—	1,522	—
Proceeds from issuance of common stock	—	3	—
Proceeds from offering	30,278	—	—
Offering costs	(3,963)	(205)	—
Net cash provided by financing activities	<u>31,456</u>	<u>8,736</u>	<u>509</u>
Net increase in cash and cash equivalents	<u>20,413</u>	<u>3,303</u>	<u>314</u>
Cash and cash equivalents at beginning of period	3,620	317	3
Cash and cash equivalents at end of period	<u>\$ 24,033</u>	<u>\$ 3,620</u>	<u>\$ 317</u>
<i>Supplemental disclosure of cash flow information:</i>			
Cash paid for income taxes	<u>\$ —</u>	<u>\$ —</u>	<u>\$ —</u>
Cash paid for interest	<u>\$ —</u>	<u>\$ 2</u>	<u>\$ —</u>
<i>Supplemental non-cash financing transactions:</i>			
Conversion of Series A preferred stock to common stock	<u>\$ 8,319</u>	<u>\$ —</u>	<u>\$ —</u>
Conversion of convertible notes common stock	<u>\$ 11,445</u>	<u>\$ —</u>	<u>\$ —</u>
Conversion of convertible notes to Series A preferred stock	<u>\$ —</u>	<u>\$ 2,778</u>	<u>\$ —</u>
Exercise of premium conversion derivative	<u>\$ —</u>	<u>\$ 685</u>	<u>\$ —</u>
Redemption value change of Series A preferred stock	<u>\$ 366</u>	<u>\$ 2,968</u>	<u>\$ —</u>
Issuance of common stock for acquisition of in-process research and development	<u>\$ —</u>	<u>\$ 908</u>	<u>\$ —</u>
Bifurcation of premium conversion derivative related to convertible notes	<u>\$ 505</u>	<u>\$ 842</u>	<u>\$ 55</u>
Convertible note extinguishment	<u>\$ —</u>	<u>\$ 1,426</u>	<u>\$ —</u>
Premium conversion derivative reduction upon convertible note extinguishment	<u>\$ —</u>	<u>\$ 182</u>	<u>\$ —</u>
Conversion of related party promissory notes to convertible notes	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 359</u>
Separation of beneficial conversion feature associated with convertible notes	<u>\$ 372</u>	<u>\$ —</u>	<u>\$ —</u>
Offering costs in other assets paid in prior year	<u>\$ 205</u>	<u>\$ —</u>	<u>\$ —</u>
Offering costs in accounts payable and accrued liabilities	<u>\$ —</u>	<u>\$ 642</u>	<u>\$ —</u>

See accompanying notes.

Gemphire Therapeutics Inc.
(Formerly Known as Michigan Life Therapeutics, LLC)
Notes to Financial Statements

1. The Company and Basis of Presentation

On November 10, 2008, Michigan Life Therapeutics, LLC (MLT) was organized as a limited liability company (LLC) in Michigan. On October 30, 2014, Gemphire Therapeutics Inc. (Gemphire) was incorporated as a C corporation in the state of Delaware. On November 1, 2014, MLT entered into a merger agreement with Gemphire whereby MLT was merged with and into Gemphire with Gemphire as the surviving entity; all outstanding membership interests of MLT were exchanged for shares of Gemphire's common stock. The purpose of the merger was to change the jurisdiction of MLT from Michigan to Delaware and to convert from an LLC to a corporation. All financial results presented prior to November 1, 2014 are from the operations of MLT. MLT and Gemphire are collectively referred to as the "Company" in the accompanying notes to the financial statements. The Company's headquarters are located in Livonia, Michigan.

The Company is a clinical-stage biopharmaceutical entity focused on developing and commercializing therapies for the treatment of dyslipidemia, a serious medical condition that increases the risk of life threatening cardiovascular disease and NAFLD/NASH (nonalcoholic fatty liver disease). The Company's primary activities have been conducting research and development activities, planning clinical trials, performing business and financial planning, recruiting personnel and raising capital. The Company is subject to certain risks, which include the need to research, develop, and clinically test potentially therapeutic products, initially one product candidate gemcabene (also known as CI-1027); obtain regulatory approval for its products and commercialize them around the world; expand its management scientific staff; finance its operations; and, find collaboration partners to further advance development and commercial efforts.

Initial Public Offering and Capital Requirements

On August 4, 2016, the Company's Registration Statement on Form S-1 (File No 333-210815) relating to its IPO of its common stock was declared effective by the Securities and Exchange Commission (SEC). Pursuant to such Registration Statement, on August 10, 2016, the Company closed its IPO whereby 3,000,000 shares of its common stock were issued and sold at a public offering price of \$10.00 per share. On September 8, 2016, the Company closed the sale of 27,755 shares of its common stock at the public offering price of \$10.00 per share, representing a partial exercise of the underwriters' over-allotment option, following which, the IPO terminated. The Company received net proceeds of approximately \$26.1 million after deducting underwriting discounts and commissions of \$2.1 million and other offering expenses of \$2.1 million.

Immediately prior to the IPO, the Company amended and restated its certificate of incorporation and bylaws to, among other things, change its authorized capital stock to consist of (i) 100,000,000 shares of common stock and (ii) 10,000,000 shares of undesignated preferred stock. Both the common stock and the preferred stock have a par value of \$0.001 per share.

The Company has sustained operating losses since inception and expects such losses to continue over the next several years. Management plans to continue financing the operations with equity issuances. The Company's management believes the cash and cash equivalents on hand are adequate to fund the Company's operations for at least the next 12 months. If adequate funds are not available, the Company may be required to delay, reduce the scope of, or eliminate part or all of its research and development programs.

Basis of Presentation

Certain prior period balances have been reclassified to conform to the current period presentation. Specifically, the Company reclassified all current deferred tax liabilities as long term in the amount of \$10,000 on its December 31, 2015 balance sheet in conformity with the adoption of Accounting Standards Update (ASU) 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes* (ASU 2015-17).

Reverse Stock Split

In April 2016, the board of directors approved an amendment to the Company's certificate of incorporation to effect a 1-for-3.119 reverse stock split (the Reverse Stock Split) for all common and Series A preferred stock. The Reverse Stock

Gemphire Therapeutics Inc.
(Formerly Known as Michigan Life Therapeutics, LLC)
Notes to Financial Statements - continued

Split became effective on April 27, 2016 upon the filing of the amendment to the certificate of incorporation. The authorized shares and par value of the common stock and Series A preferred stock were not adjusted as a result of the Reverse Stock Split. All issued and outstanding common and Series A preferred stock, options for common stock and per share amounts contained in the financial statements were retroactively adjusted to reflect the Reverse Stock Split for all periods presented.

2. Summary of Significant Accounting Policies

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates.

Cash and Cash Equivalents

The Company considers all highly liquid investments with an original maturity of 90 days or less at the time of deposit to be cash equivalents. The Company invests excess cash in readily available checking and savings accounts and highly liquid investments in money market accounts.

Fair Value of Financial Instruments

The Company's financial instruments include principally cash and cash equivalents, other current assets, accounts payable, accrued liabilities and debt. The carrying amounts for these financial instruments reported in the balance sheets approximate their fair values. See Note 11 — Fair Value Measurements, for further discussion of fair value.

General and Administrative Expenses

General and administrative expenses consist primarily of personnel-related costs, including salaries and share-based compensation costs, for personnel in functions not directly associated with research and development activities. Other significant costs include legal fees related to intellectual property and corporate matters and professional fees for accounting and other services.

Research and Development Expenses

Research and development expenses consist of costs incurred in performing research and development activities, including compensation for research and development employees, costs associated with preclinical studies and trials, regulatory activities, manufacturing activities to support clinical activities, license fees, non-legal patent costs, fees paid to external service providers that conduct certain research and development, clinical costs and an allocation of overhead expenses. Research and development costs are expensed as incurred.

Acquired In-Process Research and Development Expenses

The Company includes costs to acquire or in-license product candidates in acquired in-process research and development expenses. The Company has acquired the right to develop and commercialize its product candidate gemcabene. These costs are immediately expensed provided that the payments do not also represent processes or activities that would constitute a "business" as defined under GAAP or provided that the product candidate has not achieved regulatory approval for marketing and absent obtaining such approval, has no alternative future use. Royalties owed on future sales of any licensed product will be expensed in the period the related revenues are recognized.

Gemphire Therapeutics Inc.
(Formerly Known as Michigan Life Therapeutics, LLC)
Notes to Financial Statements - continued

Income Taxes

The Company utilizes the liability method of accounting for income taxes as required by Accounting Standards Codification (ASC) 740, *Income Taxes*. Under this method, deferred tax assets and liabilities are determined based on differences between financial reporting and the tax basis of assets and liabilities and are measured using enacted tax rates and laws that will be in effect when the differences are expected to reverse. Currently, there is no provision for income taxes, as the Company has incurred operating losses to date, and a full valuation allowance has been provided on the net deferred tax assets. MLT was treated as a partnership for federal and state income tax purposes. Accordingly, no provision was made for income taxes for periods prior to November 1, 2014, since the Company's net loss (subject to certain limitations) was passed through to the income tax returns of its members. Upon incorporation on October 30, 2014, the Company became taxed as a corporation.

Share-Based Compensation

The Company accounts for share-based compensation in accordance with the provisions of ASC 718, *Compensation — Stock Compensation* (ASC 718). Accordingly, compensation costs related to equity instruments granted are recognized at the grant-date fair value. Additionally, as a result of the early adoption of ASU 2016-09, *Compensation — Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting*, the Company has made an accounting policy election to record forfeitures when they occur. Share-based compensation arrangements to non-employees are accounted for in accordance with the applicable provisions of ASC 718 and ASC 505, *Equity*, using a fair value approach. The compensation costs of these arrangements are subject to re-measurement as the equity instruments vest and are recognized as expense over the related service period (typically the vesting period of the awards).

Common Stock Valuation

Due to the absence of an active market for the Company's common stock prior to the close of the IPO, the Company utilized methodologies in accordance with the framework of the American Institute of Certified Public Accountants' Technical Practice Aid, *Valuation of Privately-Held Company Equity Securities Issued as Compensation*, to estimate the fair value of its common stock. The valuation methodology included estimates and assumptions that required the Company's judgment. These estimates and assumptions included a number of objective and subjective factors, including external market conditions affecting the biopharmaceutical industry sector, and the likelihood of achieving a liquidity event, such as an initial public offering or sale. Significant changes to the key assumptions used in the valuations could have resulted in different fair values of common stock at each valuation date.

Convertible Preferred Stock

On March 31, 2015, the Company issued 745,637 shares of Series A convertible preferred stock (the Series A preferred stock). On August 10, 2016, immediately prior to the closing of the IPO, the Company's Series A preferred stock, together with accrued dividends thereon, converted into 827,205 shares of common stock. The Series A preferred stock prior to conversion was classified outside of permanent equity, in mezzanine equity, on the Company's balance sheet. The Company initially records preferred stock that may be redeemed at the option of the holder, or based on the occurrence of events outside of the Company's control, at the value of the proceeds received. Subsequently, if it is probable that the preferred stock will become redeemable, the Company recognizes changes in the redemption value immediately as they occur and adjusts the carrying amount of the instrument to equal the redemption value at the end of each reporting period. If it is not probable that the preferred stock will become redeemable, the Company does not adjust the carrying value. In the absence of retained earnings, these charges are recorded against additional paid-in-capital, if any, and then to accumulated deficit. See Note 7 — *Convertible Series A Preferred Stock* for further discussion. As a result of their conversion to common stock on August 10, 2016 as described above, no shares of Series A preferred stock were outstanding as of December 31, 2016.

Gemphire Therapeutics Inc.
(Formerly Known as Michigan Life Therapeutics, LLC)
Notes to Financial Statements - continued

Segment Information

Operating segments are components of an enterprise for which separate financial information is available and is evaluated regularly by the Company's chief operating decision maker in deciding how to allocate resources and assessing performance. The Company's chief operating decision maker is its Chief Executive Officer. The Company's Chief Executive Officer views the Company's operations and manages its business in one operating segment, which is the business of development and commercialization of therapeutics for the treatment of dyslipidemia, a serious medical condition that increases the risk of life threatening cardiovascular disease and NAFLD/NASH. Accordingly, the Company has a single reporting segment.

Jumpstart Our Business Startups Act Accounting Election

As an emerging growth company under the Jumpstart Our Business Startups Act (JOBS Act), the Company is eligible to take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies. The Company has irrevocably elected not to avail itself of this exemption and, therefore, will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

Recent Accounting Pronouncements

In May 2014, the FASB issued ASU 2014-09, *Revenue from Contracts with Customers — Topic 606*, which supersedes the revenue recognition requirements in FASB ASC 605. The new guidance primarily states that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods and services. In 2015, the FASB agreed to allow companies to delay the implementation of this standard for one year effective for annual reporting periods beginning after December 15, 2017, including interim periods within that reporting period. Early application is permitted only for periods beginning after December 15, 2016. The Company plans to adopt this standard on January 1, 2018 and to select the modified retrospective transition method. The Company plans to modify its accounting policies to reflect the requirements of this standard however, the planned adoption will not affect the Company's financial statements and related disclosures for these periods or future periods until the Company generates revenues.

In August 2014, the FASB issued Accounting Standards Update No. 2014-15, *Presentation of Financial Statements — Going Concern (Subtopic 205-40): Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern* (ASU 2014-15), which requires management to evaluate, in connection with preparing financial statements for each annual and interim reporting period, whether there are conditions or events that, considered in the aggregate, raise substantial doubt about an entity's ability to continue as a going concern within one year after the date that the financial statements are issued (or within one year after the date that the financial statements are available to be issued, when applicable) and provide related disclosures. ASU 2014-15 is effective for the annual period ending after December 15, 2016, and for annual and interim periods thereafter. Early adoption is permitted. The Company elected to adopt this standard early as of December 31, 2015 and did not have a material impact on the Company's financial statements.

In November 2015, the Financial Accounting Standards Board (FASB) issued ASU 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes* (ASU 2015-17). The new guidance simplifies the presentation of deferred income taxes by requiring that deferred tax liabilities and assets be classified as noncurrent in a classified statement of financial position. ASU 2015-17 applies to all entities that present a classified statement of financial position. The current requirement that deferred tax liabilities and assets of a tax-paying component of an entity be offset and presented as a single amount is not affected by this ASU. For public entities, ASU 2015-17 is effective for financial statements issued for annual periods beginning after December 15, 2016 with earlier application permitted. The new guidance may be applied either prospectively or retrospectively to all periods presented. The Company adopted this standard effective April 1, 2016 on a retrospective basis for each period presented. The adoption of this standard did not have a material impact on the Company's financial statements.

In January 2016, the FASB issued ASU No. 2016-01, *Financial Instruments — Overall: Recognition and Measurement of Financial Assets and Financial Liabilities*. The guidance affects the accounting for equity investments, financial

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liabilities under the fair value option and the presentation and disclosure requirements of financial instruments. The guidance is effective in the first quarter of fiscal 2019. Early adoption is permitted for the accounting guidance on financial liabilities under the fair value option. The Company is currently evaluating the impact of the new guidance on its financial statements.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)*. The objective of this update is to increase transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet and disclosing key information about leasing arrangements. This ASU is effective for fiscal years beginning after December 15, 2018, including interim periods within those annual periods and is to be applied utilizing a modified retrospective approach. The Company is currently evaluating the new guidance to determine the impact it may have on its financial statements.

In March 2016, the FASB issued ASU 2016-09, *Compensation – Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting*. This ASU simplifies the accounting for share-based payment award transactions including: income tax consequences, classification of awards as either equity or liabilities and classification on the statement of cash flows. This ASU is effective for fiscal years beginning after December 15, 2016, including interim periods within those fiscal years. Early adoption is permitted. The Company adopted this standard effective July 1, 2016 on a retrospective basis for each period presented. The adoption of this standard did not have a material impact on the Company's financial statements.

In November 2016, the FASB issued ASU No. 2016-18, *Statement of Cash Flows (Topic 230): Restricted Cash*. The objective of this ASU is to eliminate the diversity in practice related to the classification of restricted cash or restricted cash equivalents in the statement of cash flows. For public business entities, this ASU is effective for annual and interim reporting periods beginning after December 15, 2017, with early adoption permitted. The amendments in this update should be applied retrospectively to all periods presented. The Company is currently evaluating the requirements of this new guidance and has not yet determined its impact on the Company's financial statements.

3. Accrued Liabilities

Accrued liabilities consist of the following (in thousands):

	As of December 31,	
	2016	2015
Accrued offering costs	\$ —	\$ 575
Legal costs	54	234
Accrued compensation costs	706	2
Other research and development expenses	1,259	759
Other general and administrative expenses	94	47
Total	<u>\$ 2,113</u>	<u>\$ 1,617</u>

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4. Debt

Promissory Notes to Related Parties

The Company issued promissory notes to related parties (the Promissory Notes) at a compound interest rate of 8% per annum for an aggregate principal amount of \$0.3 million on various dates from March 2009 through October 2014 with maturity dates through October 31, 2014. The Promissory Notes along with accrued interest were exchanged for convertible notes (the Convertible Notes) on November 1, 2014, in the amount of \$0.4 million inclusive of accrued interest.

Convertible Notes

The Company completed a series of convertible note financings with certain investors beginning on November 1, 2014 and ending on February 18, 2015 (the Convertible Notes), whereby a total of \$2.7 million was loaned to the Company, of which \$2.0 million was loaned in 2015. Interest for the Convertible Notes compounded on a daily basis at a rate of 8 percent per annum. The Convertible Notes converted into shares of the Company's Series A preferred stock upon close of the Series A preferred stock financing on March 31, 2015. The conversion equaled 125% of the unpaid principal plus unpaid accrued interest on the Convertible Notes.

At the time of their issuance, the Convertible Notes contained a conversion premium with regard to the conversion into the Series A preferred stock. The Company determined that the redemption feature under the Convertible Notes qualified as an embedded derivative and was separated from its debt host. The bifurcation of the embedded derivative from its debt host resulted in a discount to the Convertible Notes. The discount was amortized to interest expense over the term of the Convertible Notes using the straight-line method. The embedded derivative was accounted for separately on a fair market value basis. The Company recorded the fair value changes of the premium conversion derivative associated with the Convertible Notes to interest expense that amounted to \$0.4 million and \$18,000 for the years ended December 31, 2015 and 2014, respectively. As a result of their conversion into shares of Series A preferred stock on March 31, 2015 as described above, there were no Convertible Notes outstanding during 2016.

Interim Notes

On July 31, 2015, the Company entered into a convertible interim note financing (collectively with the notes issued in December 2015, February 2016 and April 2016, the Interim Notes), pursuant to which certain investors agreed to loan the Company approximately \$2.8 million. On August 10, 2016, immediately prior to the closing of the IPO, the Company's Interim Notes, together with accrued interest thereon, converted into 1,656,807 shares of common stock.

The Interim Notes accrued interest at a rate of 8% per annum, compounded annually, and would automatically convert into shares issued to investors in the Company's next equity financing round that results in gross proceeds of at least \$5.0 million (a Qualified Financing). The conversion would be equal to unpaid principal at 115% plus any unpaid accrued interest. The investors would be paid out principal at 200% if a change of control occurred before the next financing round. In the event that a Qualified Financing, change of control, or an IPO did not occur before July 31, 2016, the parties would then negotiate a price for conversion into a new round of stock.

In December 2015, the Company amended the Interim Notes and certain investors agreed to loan the Company an additional \$2.7 million for a revised financing total of \$5.5 million. The Interim Notes continued to accrue interest at an 8% rate per annum compounded annually, but were amended to automatically convert into shares of the same class of the Company's next convertible preferred stock financing round (the Preferred Stock Financing). The conversion into shares issued in the Preferred Stock Financing would be equal to unpaid principal at 115% plus unpaid accrued interest. In the event that either a change of control occurs or the Company completes a public transaction which results in the Company's stockholders holding securities listed on a national securities exchange, including an IPO, before the Preferred Stock Financing, the Interim Notes, as amended, would automatically convert into shares of the Company's common stock at a conversion price of \$6.70585 per share (which represents the original issue price of the Series A preferred stock) based on 100% of outstanding principal and unpaid accrued interest. Lastly, if a Preferred Stock

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Financing, change of control, or public transaction did not occur before December 31, 2016, the parties agreed to then negotiate a conversion price into a new round of stock.

In February 2016, certain investors agreed to loan the Company an additional \$0.2 million for a revised financing total of \$5.6 million. The Interim Notes continued to accrue interest at an 8% rate per annum compounded annually, but were amended to automatically convert into shares of the same class of the Company's next Preferred Stock Financing. The conversion into shares issued in the Preferred Stock Financing would be equal to unpaid principal at 115% plus unpaid accrued interest. In the event that either a change of control occurs or the Company completes a public transaction which results in the Company's stockholders holding securities listed on a national securities exchange, including an IPO, before the Preferred Stock Financing, the Interim Notes, as amended, would automatically convert into shares of the Company's common stock at a conversion price of \$6.70585 per share (which represents the original issue price of the Series A preferred stock as adjusted for the Reverse Stock Split (as defined below)) based on 100% of outstanding principal and unpaid accrued interest. Lastly, if a Preferred Stock Financing, change of control, or public transaction did not occur before December 31, 2016, the parties agreed to then negotiate a conversion price into a new round of stock.

In April 2016, the Company amended the Interim Notes and certain investors agreed to loan the Company an additional \$5.0 million for a revised financing total, including Interim Notes previously issued, of \$10.6 million. The Interim Notes continued to accrue interest at an 8% rate per annum compounded annually, but were amended so that 125% of the unpaid principal and accrued interest, would automatically convert into shares of the same class of the Company's next convertible preferred stock financing round of at least \$5.0 million (the Qualified Financing). In the event that either a change of control occurs or the Company completes a public transaction which results in the Company's stockholders holding securities listed on a national securities exchange, including an IPO, before the Qualified Financing, 100% of outstanding principal and unpaid accrued interest on the Interim Notes, as amended, would automatically convert into shares of the Company's common stock at a conversion price of \$6.70585 per share, as adjusted for the Reverse Stock Split. Lastly, if a Qualified Financing, change of control, or public transaction did not occur, the Interim Notes would become payable on demand anytime after December 31, 2016. The Company incurred issuance costs related to the April 2016 financing in the amount of \$10,000. The Interim Notes were discounted for the issuance costs, and the discount was amortized to interest expense over their remaining term using the straight-line method.

On August 10, 2016, immediately prior to the closing of the IPO, the Company's Interim Notes, together with accrued interest thereon, converted into 1,656,807 shares of common stock. At the time of their issuance, the Interim Notes contained a conversion premium with regard to the conversion into shares at the time of the next Qualified Financing. The Company determined that the redemption feature under the Interim Notes qualified as an embedded derivative and was separated from its debt host. The bifurcation of the embedded derivative from its debt host resulted in a discount to the Interim Notes. The discount was amortized to interest expense over the term of the Interim Notes using the straight-line method. The embedded derivative was accounted for separately on a fair market value basis. The fair value of the derivative associated with the Interim Notes was \$0.3 million at December 31, 2015 and was included as premium conversion derivative on the accompanying balance sheets. As a result of the conversion of the Interim Notes, together with accrued interest thereon, into common stock immediately prior to the closing of the IPO, there was no premium conversion derivative outstanding as of December 31, 2016. The Company recorded the fair value changes of the premium conversion derivative associated with the Interim Notes to interest income (expense) that amounted to \$0.2 million, \$(0.1) million and zero for the years ended December 31, 2016, 2015 and 2014, respectively.

As a result of their conversion to common stock on August 10, 2016 as described above, there were no Interim Notes outstanding as of December 31, 2016.

5. Commitments and Contingencies

Pfizer License Agreement

In April 2011, the Company and Pfizer Inc. (Pfizer) entered into an exclusive license agreement (the Pfizer Agreement) for the clinical product candidate gemcabene. In exchange for this worldwide exclusive right and license to certain patent rights to make, use, sell, offer for sale and import the clinical product gemcabene, the Company agreed to certain milestone and royalty payments on future sales (See Note 6 — *License Agreement*). As of December 31, 2016, there was

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sufficient uncertainty with regard to both the outcome of the clinical trials and the ability to obtain sufficient funding to support any of the cash milestone payments under the license agreement, and as such, no liabilities were recorded related to the license agreement.

Series A Preferred Stock Dividends

Holders of the Series A preferred stock were entitled to cumulative accruing dividends at a simple rate of 8% per year on the original issue price of the preferred stock of \$6.70585 per share, as adjusted for the Reverse Stock Split. The dividends effectively accrued daily on each share of preferred stock. The dividends were payable upon the earliest to occur of (1) the date determined by the Board, (2) the liquidation of the Company (including a deemed liquidation event) or (3) the conversion or redemption of at least a majority of the outstanding shares of Series A preferred stock. If the board reasonably believed that the Company was not legally able to pay the dividends in cash at the payment date, or if elected by the majority of the Series A preferred stockholders or if issued in connection with an IPO, the dividends were to be paid in shares of common stock at the conversion price for the Series A preferred stock in effect at that time, which was the original issue price of the Series A preferred stock as adjusted from time to time for any stock dividends, combinations, splits or recapitalizations. Since the dividends were payable upon a contingent event, the Company did not record them in the accompanying financial statements as of December 31, 2015; however, cumulative unpaid dividends for the Series A preferred stock totaled \$0.3 million as of December 31, 2015. On August 10, 2016, immediately prior to the closing of the IPO, the Company's Series A preferred stock, together with accrued dividends thereon, converted into 827,205 shares of common stock, and as such, there were no cumulative unpaid dividends for the Series A preferred stock as of December 31, 2016.

Other Agreements

Both cancellable and non-cancellable facility agreements were in place that provided for fixed monthly rent for the years ended December 31, 2016, 2015 and 2014. The total rent expense was \$58,000, \$23,000 and \$6,000 for the years ended December 31, 2016, 2015 and 2014, respectively. In May 2016, the Company entered into a new lease agreement for its headquarters location, commencing in August 2016. The initial term of the agreement is 3 years with an initial monthly base rent of approximately \$8,400. In conjunction with entering into the new lease agreement, the Company cancelled its original Northville, Michigan lease agreement, as amended, effective August 31, 2016 and renegotiated a new cancellable lease agreement for limited use of office space in the Northville location that expires in September 2017.

Future minimum lease payments under fixed non-cancellable operating leases that expire on various dates through August 2019 consist of the following (in thousands):

	<u>December 31,</u>
2017	\$ 101
2018	101
2019	58
Total	<u>\$ 260</u>

6. License Agreement

In April 2011, the Company entered into the Pfizer Agreement for a worldwide exclusive license to certain patent rights to make, use, sell, offer for sale and import the clinical product candidate gemcabene. In exchange for this license, the Company agreed to issue shares of its common stock to Pfizer representing 15% of the Company's fully diluted capital at the close of its first arms-length Series A financing, which occurred on March 31, 2015.

The Company agreed to make milestone payments totaling up to \$37 million upon the achievement of certain milestones, including the first regulatory submission in any country, regulatory approval in each of the United States, Europe and Japan, the first anniversary of the first regulatory approval in any country, and upon achieving certain

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aggregate sales levels of gemcabene or any product containing gemcabene. Future milestone payments under the Pfizer Agreement, if any, are not expected to begin for at least several years and extend over a number of subsequent years.

The Company also agreed to pay Pfizer tiered royalties on a country-by-country basis based upon the annual amount of net sales, as specified in the Pfizer Agreement until expiration of the last valid claim of the licensed patent rights including any patent term extensions or supplemental protection certificates. Under the Pfizer Agreement, the Company is obligated to use commercially reasonable efforts to develop and commercialize gemcabene.

On March 31, 2015, upon the closing of the Series A preferred stock financing, the Company issued 675,250 shares of its common stock, at a fair market value of \$0.9 million, to Pfizer in connection with the first equity payment, pursuant to which Pfizer became the owner of more than 5% of the Company's capital stock. The transaction was recorded as acquired in-process research and development expenses based on the fair market value of the common shares issued since no processes or activities that would constitute a "business" were acquired and none of the rights and underlying assets acquired had alternative future uses or reached a stage of technological feasibility. None of the other milestone or royalty payments were triggered as of December 31, 2016.

The Pfizer Agreement will expire upon expiration of the last royalty term. Either party may terminate the Pfizer Agreement for the other party's uncured material breach or upon specified bankruptcy events. Pfizer may terminate the Pfizer Agreement if the Company or any of its sublicensees challenge the validity, enforceability or ownership of the licensed patents. Upon termination of the license agreement for cause by Pfizer, we must grant Pfizer a non-exclusive license to use any intellectual property rights arising from the development or commercialization of gemcabene. Additionally, Pfizer may revoke the license if the Company is unable to adequately commercialize gemcabene by April 2021.

Pfizer has a non-exclusive, sub licensable, royalty-free right and license for non-commercial research or development purposes to intellectual property rights relating to gemcabene that are developed by us after the effective date of the license with Pfizer.

7. Convertible Series A Preferred Stock

On March 31, 2015, the Company issued 745,637 shares of Series A preferred stock at a per share price of \$6.70585, as adjusted for the Reverse Stock Split, or \$5.0 million in the aggregate, consisting of \$1.5 million in cash and \$3.5 million representing 125% of the principal and accrued and unpaid interest on the Convertible Notes, all of which converted into shares of Series A preferred stock. On August 10, 2016, immediately prior to the closing of the IPO, the Company's Series A preferred stock, together with accrued dividends thereon, converted into 827,205 shares of common stock.

Prior to their conversion into shares of common stock, the Series A preferred stock had the following rights and preferences:

Dividend Rights

Dividends effectively accrued on a daily basis at a simple rate of 8% per annum on the sum of the original per share issue price. Dividends were effectively deemed declared daily and were payable upon the occurrence of certain events. In addition, the holders of the Series A preferred stock had rights to participate in common stock dividends, entitling holders of Series A preferred stock to a dividend payable at the same time as the dividend paid on common stock based on the number of shares of common stock each share of Series A preferred stock would convert into if such shares had converted on the record date.

There were no dividends deemed payable and accrued as of December 31, 2016 due to the conversion of the Series A preferred stock, together with accrued dividends thereon, on August 10, 2016 immediately prior to the closing of the IPO. There were no dividends deemed payable and accrued as of December 31, 2015, but unpaid dividends were \$0.3 million as of December 31, 2015. See Note 5 — *Commitments and Contingencies*.

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Voting Rights

Each share of Series A preferred stock was entitled to vote together with the common stock on all actions to be taken by the stockholders of the Company, based on the number of shares of common stock into which each share of Series A preferred stock could be converted. A separate vote of a majority of the outstanding shares of Series A preferred stock was required to (1) issue or authorize any class or series of equity securities or equivalents, (2) effect any transaction that results in a change in control, (3) change the principal business of the Company, enter new lines of business, or exit the current line of business, (4) issue of convertible debt above a certain threshold, or (5) materially sell, transfer, license, pledge or encumber technology or intellectual property. A management stock option plan approved by the board of directors, however, was not subject to a separate vote of the Series A preferred stockholders, but any subsequent increases to the authorized option pool were subject to approval by the Series A preferred stock holders via a separate vote.

Liquidation Rights

In the event of any liquidation, dissolution, or winding-up of the Company, whether voluntary or involuntary, merger, consolidation or transaction in which over 50% of the Company's voting power was transferred, or a sale, lease, transfer, exclusive license or disposition of all or substantially all of the assets of the Company, the Series A preferred stock holders were entitled to the assets of the Company legally available for distribution before any distribution or payment was made to the holders of common stock. The distribution amount would have been equal the original issue price of the Series A preferred stock (as adjusted for any stock dividends, combinations, splits or other recapitalizations since issuance), plus any accrued or declared but unpaid dividends thereon. After payment of the full liquidation preference to the Series A preferred stock holders, the remaining assets legally available for distribution would have been distributed to the holders of common stock and holders of the Series A preferred stock pro rata based on the number of shares of common stock each share of Series A preferred stock would convert into if such shares had converted immediately prior to such liquidation, dissolution, or winding-up.

Conversion Rights

Shares of Series A preferred stock, at the option of the holder, could have been converted at any time into shares of common stock. The conversion rate would have been obtained by dividing the Series A preferred stock original issue price of \$6.70585 per share, as adjusted for the Reverse Stock Split, by the conversion price per share in effect at the time of conversion. The Series A conversion price was initially equal to the original issue price, but could be adjusted on a broad-based weighted average basis in connection with certain dilutive events. The Series A holder was also entitled to receive additional shares of common stock for any unpaid Series A dividends (whether or not declared).

Shares of Series A preferred stock would have automatically converted into common stock based upon the then-effective Series A conversion price upon the affirmative vote or consent of the holders of at least a majority of the outstanding shares of the Series A preferred stock, or at the closing of a firmly underwritten public offering.

The conversion price for the Series A preferred stock was \$6.70585 per share (as adjusted for the Reverse Stock Split) at the time of the conversion of the Series A preferred stock, together with accrued dividends thereon, immediately prior to the closing of the IPO on August 10, 2016.

Redemption Rights

The holders of at least 80% of the outstanding shares of Series A preferred stock could have required the Company to redeem all outstanding shares of Series A preferred stock at any time on or after December 31, 2020 at a redemption price equal to the greater of 150% of the liquidation preference of the Series A preferred stock or the fair market value per share plus any unpaid declared dividends. The liquidation preference of the Series A preferred stock was defined as an amount per share equal to \$6.70585, as adjusted from time to time for any stock dividends, combinations, splits or recapitalizations, plus any accrued or declared but unpaid dividends thereon.

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The redemption value for redeemable preferred stock could have at times been based on fair market value. The assumptions used in calculating the estimated fair market value at each reporting period represented the Company's best estimate, however, inherent uncertainties were involved. As a result, if factors or assumptions changed, the estimated fair value could have been materially different.

The Company recognized changes in the redemption value immediately as they occurred and adjusted the carrying amount of the instrument to equal the redemption value at the end of each reporting period since it was probable that the instruments would have become redeemable. In the absence of retained earnings, these charges were recorded against additional paid-in-capital, if any, and then to accumulated deficit.

The Company evaluated the Series A preferred stock and determined that it was considered an equity host under ASC 815, *Derivatives and Hedging*. In making this determination, the Company's analysis followed the whole instrument approach that compared an individual feature against the entire Series A preferred stock instrument that included that feature. The Company's analysis was based on a consideration of the economic characteristics and risks of the Series A preferred stock. More specifically, the Company evaluated all of the stated and implied substantive terms and features of the Series A preferred stock, including: (1) redemption features and their underlying exercisability, (2) existence of any protective covenants, (3) nature of dividends rights, (4) nature of voting rights, and (5) the existence and nature of any conversion rights. As a result of the above, the Company concluded that the Series A preferred stock represented an equity host, and as such, the redemption and/or conversion features of the Series A preferred stock were considered to be clearly and closely related to the associated Series A preferred stock host instrument. Accordingly, the redemption and/or conversion features of the Series A preferred stock were not considered an embedded derivative that required bifurcation.

8. Stockholders' and Members' Equity (Deficit)

The membership interests of MLT were converted to 1,431,228 shares of the Company's common stock on November 1, 2014. The MLT members' deficit was transferred to stockholders' deficit on the accompanying balance sheets upon conversion to a C Corporation at that time.

Common Stock

The Company had 9,270,255 and 3,758,488 shares of its common stock issued and outstanding as of December 31, 2016 and December 31, 2015, respectively. Voting, dividend and liquidation rights of the holders of the common stock are subject to the Company's articles of incorporation, corporate bylaws and underlying shareholder agreements.

Dividend Rights

Common stock holders are entitled to receive dividends at the sole discretion of the board of directors of the Company. There have been no dividends declared on common stock as of December 31, 2016.

Voting Rights

The holders of common stock are entitled to one vote for each share of common stock along with all other classes and series of stock of the Company on all actions to be taken by the stockholders of the Company, including actions that would amend the certificate of incorporation of the Company to increase the number of authorized shares of the common stock.

Liquidation Rights

In the event of any liquidation, dissolution, or winding-up of the Company, the holders of common stock shall be entitled to share in the remaining assets of the Company available for distribution post preferential distributions made to holders of the Company's preferred stock. There was no preferred stock outstanding as of December 31, 2016.

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Deferred Offering Costs

IPO offering costs of \$4.2 million, consisting of underwriting discounts and commissions, legal, accounting and other direct fees and costs, were initially capitalized and subsequently offset against the Company's IPO proceeds upon the close of the offering in August 2016. There were no deferred offering costs capitalized as of December 31, 2016. As of December 31, 2015, offering costs of \$0.8 million were capitalized.

9. Share-Based Compensation

Share-based compensation expense was included in general and administrative and research and development costs as follows in the accompanying statements of comprehensive loss (in thousands):

	Year Ended December 31,		
	2016	2015	2014
General and administrative	\$ 1,166	\$ 284	\$ 53
Research and development	552	—	—
Total share-based compensation	<u>\$ 1,718</u>	<u>\$ 284</u>	<u>\$ 53</u>

Restricted Stock Awards

During the year ended December 31, 2016, the Company did not grant any restricted stock awards (RSAs). During the years ended December 31, 2015 and 2014, the Company granted an aggregate of 44,657 and 1,605,008 RSAs, respectively, to certain of its employees, members of its board of directors and consultants subject to a 2014 Shareholders Agreement (the Agreement). The RSAs are subject to various vesting schedules and generally vest ratably over a six to twenty four month period coinciding with their respective service periods. During the years ended December 31, 2016, 2015 and 2014, no RSAs were forfeited.

A summary of RSA grant activity is as follows:

	Number of Shares	Weighted-Average Fair Value (per share)
Non-vested at December 31, 2013	—	\$ —
Granted	1,605,008	\$ 0.09
Vested	<u>(610,395)</u>	\$ 0.09
Non-vested at December 31, 2014	994,613	\$ 0.09
Granted	44,567	\$ 0.21
Vested	<u>(691,087)</u>	\$ 0.09
Non-vested at December 31, 2015	348,093	\$ 0.09
Granted	-	\$ —
Vested	<u>(344,084)</u>	\$ 0.09
Non-vested at December 31, 2016	<u>4,009</u>	\$ 0.21

There were no RSAs granted during the year ended December 31, 2016. The grant-date fair value of the RSAs issued during the years ended December 31, 2015 and 2014 was \$9,000 and \$140,000 respectively. Grant date fair market value in prior years was based on traditional valuation techniques and methods in determining the fair value of the Company's equity as a private company including market, income, and cost valuation approaches. A number of objective and subjective factors were considered including contemporaneous and retrospective valuations of its common stock performed by an unrelated valuation specialist, sales of the Company's convertible preferred stock to unrelated third parties, valuations of comparable peer public companies, the lack of liquidity of the Company's capital stock and general

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and industry-specific economic outlook. The fair value of the Company's common stock was determined by the Company's board of directors prior to the IPO.

Stock Options

In April 2015, the Company adopted a 2015 Equity Incentive Plan (the 2015 Plan) under which 320,615 shares of the Company's common stock were reserved for issuance to employees, directors and consultants. The 2015 Plan permits the grant of incentive and non-statutory stock options, appreciation rights, restricted stock, restricted stock units, performance stock and cash awards, and other stock-based awards.

Amendment and Restatement of 2015 Equity Incentive Plan

In April 2016 the Company's board of directors approved the Company's amended and restated 2015 Plan (the A&R 2015 Plan). The A&R 2015 Plan became effective immediately upon the execution and delivery of the underwriting agreement related to the IPO. The A&R 2015 Plan provides for the grant of stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards, performance-based stock awards and other forms of equity awards, as well as performance cash awards. The Company initially reserved 2,400,000 shares of common stock for issuance under the A&R 2015 Plan.

During the years ended December 31, 2016 and 2015, the Company granted an aggregate of 1,825,700 and 305,278, respectively, of stock options under the A&R 2015 Plan or the 2015 Plan to its officers, directors, employees and consultants, generally vesting over a three or four-year period.

Inducement Plan

In September 2016 the Company's board of directors approved the Company's Inducement Plan (the Inducement Plan). The Company initially reserved 300,000 shares of its common stock to be used exclusively for grants of awards to individuals who were not previously employees or directors of the Company, as an inducement material to the individual's entry into employment with the Company within the meaning of Rule 5635(c)(4) of the NASDAQ Listing Rules. The Plan was approved by the Company's board of directors without stockholder approval pursuant to Rule 5635(c)(4), and the terms and conditions of the Plan are substantially similar to the Company's stockholder-approved A&R 2015 Plan. During the year ended December 31, 2016, 198,000 stock options to newly-hired officers and employees were granted under the Inducement Plan, generally vesting over a four-year period.

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The following table summarizes the Company's stock option plan activity for the year ended December 31, 2016 and 2015 as follows:

	Number of Options	Weighted Average Exercise Price	Weighted- Average Remaining Contractual Term (years)	Aggregate Intrinsic Value(1)
Outstanding at December 31, 2014	—	\$ —	—	\$ —
Granted	305,278	\$ 2.42	—	—
Exercised	(2,436)	\$ 1.34	—	—
Forfeited/Cancelled	—	\$ —	—	—
Outstanding at December 31, 2015	302,842	\$ 2.43	9.60	\$ 1,031,000
Granted	2,023,700	\$ 10.07	—	—
Exercised	-	\$ —	—	—
Forfeited/Cancelled	(83,742)	\$ 9.12	—	—
Outstanding at December 31, 2016	2,242,800	\$ 9.07	9.48	\$ (2,759,000)
Vested and exercisable at December 31, 2016	373,158	\$ 5.86	9.06	\$ 740,000
Vested and expected to vest at December 31, 2016	2,242,800	\$ 9.07	9.48	\$ (2,759,000)

(1) The aggregate intrinsic value is calculated as the difference between the exercise price of the underlying options and the fair value of our common stock as of December 31, 2016 and 2015 of \$7.84 and \$5.83 per share, respectively.

The weighted average fair value per share of options granted during the years ended December 31, 2016 and 2015 was \$6.37 and \$1.50, respectively.

The Company measures the fair value of stock options with service-based and performance-based vesting criteria to employees, consultants and directors on the date of grant using the Black-Scholes option pricing model. The fair value of equity instruments issued to non-employees is re-measured as the award vests. The Company does not have history to support a calculation of volatility and expected term. As such, the Company has used a weighted-average volatility considering the volatilities of several guideline companies.

For purposes of identifying similar entities, the Company considered characteristics such as industry, length of trading history, and stage of life cycle. The assumed dividend yield was based on the Company's expectation of not paying dividends in the foreseeable future. The average expected life of the options was determined based on the mid-point between the vesting date and the end of the contractual term according to the "simplified method" as described in Staff Accounting Bulletin 110. The risk-free interest rate is determined by reference to implied yields available from U.S. Treasury securities with a remaining term equal to the expected life assumed at the date of grant. As a result of the early adoption of ASU 2016-09, *Compensation – Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting*, the Company has made an accounting policy election to record forfeitures when they occur.

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The weighted-average assumptions used in the Black-Scholes option-pricing model are as follows:

	Year Ended December 31,		
	2016	2015	2014
Expected stock price volatility	71.4 %	71.0 %	— %
Expected life of options (years)	6.0	5.5	—
Expected dividend yield	0 %	0 %	— %
Risk free interest rate	1.2 %	1.7 %	— %

During the years ended December 31, 2016 and 2015, 276,248 and 104,907 stock options vested, respectively. The weighted average fair value per share of options vesting during the years ended December 31, 2016 and 2015 was \$4.59 and \$1.05, respectively. During the year ended December 31, 2016, 83,742 stock options were forfeited. During the years ended December 31, 2015 and 2014, no stock options were forfeited. As of December 31, 2016, 457,200 shares were available for future issuance under the A&R 2015 and Inducement Plans.

Unrecognized share-based compensation cost for the RSAs and stock options issued under the Company's 2014 Shareholders Agreement, A&R 2015 Plan and Inducement Plan was \$11.2 million as of December 31, 2016. Approximately \$11.2 million of the unrecognized compensation cost was related to the stock options and under \$1,000 related to the RSAs. The non-employee portion of the unrecognized compensation cost was estimated utilizing the Company's fair market value for its common stock as of December 31, 2016. The unrecognized share-based expense is expected to be recognized over a weighted average period of 3.2 years for the stock options and 0.1 years for the RSAs.

Adoption of 2016 Employee Stock Purchase Plan

In April 2016 the Company's board of directors approved the 2016 Employee Stock Purchase Plan (the ESPP) in order to enable eligible employees to purchase shares of the Company's common stock at a discount following the effective date of the IPO. The Company's stockholders also approved the ESPP in April, 2016 and the ESPP became effective immediately upon the execution and delivery of the underwriting agreement related to the IPO. The Company initially reserved 150,000 shares of common stock for issuance under the ESPP. As of December 31, 2016, no shares were purchased under the ESPP.

10. Net Loss Per Common Share

Basic earnings or loss per share of common stock is computed by dividing net loss by the weighted average number of shares of common stock outstanding during the period. The holders of the Series A preferred stock had rights to participate in common stock dividends, entitling the holders of Series A preferred stock to a dividend payable at the same time and rate per share as the dividend paid on common stock based the number of shares of common stock each share of Series A preferred stock would have converted into if such shares had converted on the record date. The Series A preferred stock, however, did not have a contractual obligation to share in the losses of the Company, and as such, no losses were allocated to the Series A preferred stock for the purposes of the basic loss per share calculation while they were outstanding. Prior to the Company's incorporation, no common shares were outstanding when the Company operated as MLT.

Diluted earnings or loss per share of common stock is computed similarly to basic earnings or loss per share except the weighted average shares outstanding are increased to include additional shares from the assumed exercise of any common stock equivalents, if dilutive. The Company's RSAs, stock options, shares of Series A preferred stock, Convertible Notes and Interim Notes are considered common stock equivalents while outstanding for this purpose. Diluted earnings is computed utilizing the treasury method for the RSAs and stock options, and in the case of the Series A preferred stock, either the two-class method or the if-converted method, whichever was more dilutive. Diluted earnings with respect to the Convertible Notes and Interim Notes utilized the if-converted method, but was not applicable during the years ended December 31, 2016, 2015 and 2014 as no conditions required for conversion had

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occurred during these periods while the instruments were outstanding. No incremental common stock equivalents were included in calculating diluted loss per share because such inclusion would be anti-dilutive given the net loss reported for the years ended December 31, 2016, 2015 and 2014. The following table sets forth the computation of basic and diluted loss per share as of December 31, 2016, 2015 and 2014 (in thousands, except share and per share amounts):

	Year Ended		
	2016	2015	2014
Numerator:			
Net loss	\$ (14,586)	\$ (9,029)	\$ (320)
Adjustment to redemption value on Series A convertible preferred stock	(366)	(2,968)	—
Premium upon substantial modification of convertible notes with certain stockholders	—	(1,047)	—
Net loss attributed to common stock holders	<u>\$ (14,952)</u>	<u>\$ (13,044)</u>	<u>\$ (320)</u>
Denominator:			
Basic and diluted weighted average common shares outstanding	<u>5,809,396</u>	<u>2,875,053</u>	<u>1,521,703</u>
Basic and diluted net loss per share	<u>\$ (2.57)</u>	<u>\$ (4.54)</u>	<u>\$ (0.21)</u>

The following potential common shares were not considered in the computation of diluted net loss per share as their effect would have been anti-dilutive:

	Year Ended		
	2016	2015	2014
Restricted stock awards	4,009	348,093	994,613
Stock options	2,242,800	302,842	—
Series A	—	745,637	—
Convertible notes	—	828,751	—

11. Fair Value Measurements

The Company follows accounting guidance that emphasizes that fair value is a market-based measurement, not an entity specific measurement. Fair value is defined as “the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.” Fair value measurements are defined on a three level hierarchy:

Level 1 inputs: Unadjusted quoted prices for identical assets or liabilities in active markets;

Level 2 inputs: Quoted prices for similar assets and liabilities in active markets, quoted prices in markets that are not active, or inputs which are observable, weather directly or indirectly, for substantially the full term of the asset or liability;

Level 3 inputs: Unobservable inputs that reflect the Company’s own assumptions about the assumptions market participants would use in pricing the asset or liability in which there is little, if any, market activity for the asset or liability at the measurement date.

As of December 31, 2016 and 2015, the fair values of cash and cash equivalents, other assets, accounts payable and accrued liabilities approximated their carrying values because of the short-term nature of these assets or liabilities. The estimated fair value of the Company’s Interim Notes was based on amortized cost which was deemed to approximate fair value. The derivative liability associated with the conversion premium on the Interim Notes was based on cash flow models discounted at current implied market rates evidenced in recent arms-length transactions representing expected returns by market participants for similar instruments which were based on Level 3 inputs. There were no transfers between fair value hierarchy levels during the years ended December 31, 2016 and 2015.

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The fair value of financial instruments measured on a recurring basis is as follows (in thousands):

Description	As of December 31, 2015			
	Total	Level 1	Level 2	Level 3
Liabilities:				
Premium conversion derivative	\$ 345	\$ —	\$ —	\$ 345
Total liabilities at Fair Value	\$ 345	\$ —	\$ —	\$ 345

The following table provides a roll-forward of the Company's premium conversion derivative liabilities measured at fair value on a recurring basis using unobservable level 3 inputs (in thousands):

	For the Year Ended December 31,		
	2016	2015	2014
Balance as of beginning of period	\$ 345	\$ 73	\$ —
Issuance of underlying convertible notes	505	842	55
Change in fair value of premium conversion derivative	(850)	297	18
Reversal of premium conversion derivative associated with note extinguishment	—	(182)	—
Redemption of underlying convertible notes	—	(685)	—
Balance as of end of period	<u>\$ —</u>	<u>\$ 345</u>	<u>\$ 73</u>

There were no financial instruments measured on a recurring basis as of December 31, 2016 and on a non-recurring basis for any of the periods presented.

12. Income Taxes

The effective tax rate for the years ended December 31, 2016, 2015 and 2014 was zero percent. MLT was treated as a partnership for federal and state income tax purposes. Accordingly, no provision was made for income taxes for periods prior to the merger, since the Company's net loss (subject to certain limitations) was passed through to the income tax returns of its members. Upon the incorporation of Gemphire on October 30, 2014, the Company became taxed as a corporation.

A reconciliation of income tax computed at the statutory federal income tax rate to the provision (benefit) for income taxes included in the accompanying statements of comprehensive loss is as follows:

	For the Year Ended December 31,		
	2016	2015	2014
Income tax (benefit) provision at federal statutory rate	(34.0)%	(34.0)%	(34.0)%
Valuation allowance	40.2	38.2	36.8
State income tax, net of federal benefit	(4.7)	(4.0)	(4.0)
Convertible notes	1.1	0.6	1.2
Research credits	(4.0)		
Other	1.4	(0.8)	—
Effective tax rate	<u>— %</u>	<u>— %</u>	<u>— %</u>

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Significant components of the Company's deferred tax assets and liabilities are summarized in the tables below as of (in thousands):

	Year Ended December 31,	
	2016	2015
Deferred tax assets:		
Federal and state operating loss carryforwards	\$ 2,289	\$ 2,723
Research and development costs deferral election	5,254	—
Acquired intangibles	351	345
Accruals	13	—
Convertible notes	—	460
Charitable contributions	12	4
Stock-based compensation	633	41
Research and development credit carryforwards	768	95
	9,320	3,668
Valuation allowance	(9,320)	(3,657)
Total deferred tax assets, net of valuation allowance	—	11
Deferred tax liabilities:		
Restricted stock awards	—	(11)
Total deferred tax liabilities	—	(11)
Net deferred tax assets	\$ —	\$ —

As of December 31, 2016 and 2015, the Company had gross deferred tax assets of approximately \$9.3 million and \$3.7 million, respectively. Realization of the deferred assets is primarily dependent upon future taxable income, if any, the amount and timing of which are uncertain. The Company has had significant pre-tax losses since its inception. The Company has not yet generated revenues and faces significant challenges to becoming profitable. Accordingly, the net deferred tax assets have been fully offset by a valuation allowance of \$9.3 million and \$3.7 million as of December 31, 2016 and 2015, respectively. U.S. net deferred tax assets will continue to require a valuation allowance until the Company can demonstrate their realizability through sustained profitability or another source of income.

As of December 31, 2016 and 2015, the tax effect of the Company's federal net operating loss carryforwards was approximately \$2.1 million and \$2.4 million, respectively. The Company had federal research credit carryforwards as of December 31, 2016 and 2015 of approximately \$0.7 million and \$95,000, respectively. The federal net operating loss and tax credit carryforwards will begin to expire in 2034 if not utilized. As of December 31, 2016 and 2015, the Company had state net operating loss carryforwards with a tax effect of approximately \$0.2 million and \$0.3 million, respectively. The Company had state research credit carryforwards of \$24,000 as of December 31, 2016 and no state research credit carryforwards as of December 31, 2015. The state net operating loss carryforwards will begin to expire in 2026, if not utilized, and the state research credit carryforwards will begin to expire in 2023 if not utilized.

Utilization of the net operating loss carryforwards and credits may be subject to a substantial annual limitation due to the ownership change limitations provided by Section 382 of the Internal Revenue Code of 1986, as amended, and similar state provisions. Generally, in addition to certain entity reorganizations, the limitation applies when one or more "5-percent shareholders" increase their ownership, in the aggregate, by more than 50 percentage points over a 36-month time period testing period, or beginning the day after the most recent ownership change, if shorter. The annual limitation may result in the expiration of net operating losses and credits before utilization.

The Company recognizes interest and/or penalties related to uncertain tax positions in income tax expense. There were no uncertain tax positions as of December 31, 2016 and 2015, and as such, no interest or penalties were recorded to income tax expense.

The Company's corporate returns are subject to examination for the 2014 and 2015 tax years for federal and subject to examination for the 2015 tax year in various state jurisdictions. Prior to this period, the Company filed partnership returns, resulting in its income being passed through to its members.

13. Supplementary Data — Quarterly Financial Data (unaudited)

The following table presents certain unaudited quarterly financial information for each of the eight fiscal quarters in the period ended December 31, 2016. This quarterly information has been prepared on the same basis as the audited

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financial statements and includes all adjustments, consisting only of normal recurring adjustments, necessary for a fair presentation of the information for the periods presented. The results for these quarterly periods are not necessarily indicative of the operating results for a full year or any future period.

	Three Months Ended			
	December 31, 2016 (B)	September 30, 2016	June 30, 2016	March 31, 2016
	(in thousands, except per share amounts)			
Operating expenses:				
General and administrative	\$ 2,389	\$ 1,466	\$ 1,051	\$ 1,050
Research and development	4,839	1,936	789	1,176
Total operating expenses	7,228	3,402	1,840	2,226
Loss from operations	(7,228)	(3,402)	(1,840)	(2,226)
Interest income (expense)	13	(475)	449	127
Other income (expense)	1	(1)	—	(4)
Loss before income taxes	(7,214)	(3,878)	(1,391)	(2,103)
Provision (benefit) for income taxes	—	—	—	—
Net loss	(7,214)	(3,878)	(1,391)	(2,103)
Other comprehensive loss, net of tax	—	—	—	—
Comprehensive loss	\$ (7,214)	\$ (3,878)	\$ (1,391)	\$ (2,103)
Net loss	\$ (7,214)	\$ (3,878)	\$ (1,391)	\$ (2,103)
Adjustment to redemption value on Series A convertible preferred stock	—	(67)	(150)	(149)
Net loss attributable to common stockholders	\$ (7,214)	\$ (3,945)	\$ (1,541)	\$ (2,252)
Net loss per share:				
Basic and diluted (A)	\$ (0.78)	\$ (0.56)	\$ (0.42)	\$ (0.65)

	Three Months Ended			
	December 31, 2015	September 30, 2015	June 30, 2015	March 31, 2015
	(in thousands, except per share amounts)			
Operating expenses:				
General and administrative	\$ 1,047	\$ 997	\$ 658	\$ 475
Research and development	1,464	1,369	952	206
Acquired in-process research and development	—	—	—	908
Total operating expenses	2,511	2,366	1,610	1,589
Loss from operations	(2,511)	(2,366)	(1,610)	(1,589)
Interest income (expense)	137	(209)	—	(690)
Loss on convertible note extinguishment	(198)	—	—	—
Other income (expense)	2	6	(1)	—
Loss before income taxes	(2,570)	(2,569)	(1,611)	(2,279)
Provision (benefit) for income taxes	—	—	—	—
Net loss	(2,570)	(2,569)	(1,611)	(2,279)
Other comprehensive loss, net of tax	—	—	—	—
Comprehensive loss	\$ (2,570)	\$ (2,569)	\$ (1,611)	\$ (2,279)
Net loss	\$ (2,570)	\$ (2,569)	\$ (1,611)	\$ (2,279)
Adjustment to redemption value on Series A convertible preferred stock	(150)	(152)	(149)	(2,517)
Premium upon substantial modification of convertible notes with certain stockholders	(1,047)	—	—	—
Net loss attributable to common stockholders	\$ (3,767)	\$ (2,721)	\$ (1,760)	\$ (4,796)
Net loss per share:				
Basic and diluted (A)	\$ (1.14)	\$ (0.87)	\$ (0.60)	\$ (2.27)

(A) Net loss per share for the year does not equal the sum of the four historical quarters loss per share due to changes in weighted-average shares outstanding.

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- (B) Activity for the quarterly period ending December 31, 2016 reflects activity post IPO depicting a ramp-up of research and development expenses given the additional IPO proceeds and an increase in general and administrative expenses attributed to becoming a public company.

14. Related Party Transactions

The Company rented an office in Northville, Michigan from an LLC owned by two officers under short-term agreements during the years ended December 31, 2016, 2015 and 2014. The original facility lease, as amended, was cancelled and replaced with a cancellable lease agreement in August 2016 for limited use of office space in the same Northville location. The new lease agreement became effective in August 2016 and expires in September 2017. Rent expense under the related party agreements was \$21,000, \$23,000 and \$6,000 during the years ended December 31, 2016, 2015 and 2014, respectively. A prepaid rent balance related to the short-term agreements amounted to zero and \$3,000 as of December 31, 2016 and 2015, respectively.

During the first quarter of 2015, the Company issued \$2.0 million of additional Convertible Notes (the 2015 Notes) as part of the Convertible Notes described in Note 4 — *Debt*. The 2015 Notes included four notes in the aggregate of \$0.3 million issued to investors who were related to one board member and three officers of the Company. On March 31, 2015, all of the Convertible Notes (including the 2015 Notes) were converted into 516,421 shares of Series A preferred stock. The conversion included a total of 68,649 shares of Series A preferred stock issued to two officers of the Company, and 63,967 shares of Series A preferred stock issued to investors related to one board member and three officers of the Company.

During the third quarter of 2015, the Company issued \$2.8 million of Interim Notes as described in Note 4 — *Debt*. Such Interim Notes included five notes issued to two officers and three board members (or entities they control) in the amount of \$0.5 million. In addition, such Interim Notes included four notes to investors who were related to three of the Company's officers and to one of the Company's key employees in the amount of \$0.3 million.

In December 2015, the Company issued an additional \$2.7 million of Interim Notes, as described in Note 4 — *Debt*, which included six notes issued to two officers and four board members in the amount of \$0.6 million. The December 2015 Interim Note issuances also included five notes to investors who were related to three of the Company's officers in the amount of \$0.2 million.

In February 2016, the Company issued an additional \$0.2 million of Interim Notes, as described in Note 4 — *Debt*, which included two notes issued to two board members (or entities they control) in the amount of \$81,000. The February 2016 Interim Note issuances also included a \$20,000 note to an investor who is related to an officer of the Company.

In April 2016, the Company issued an additional \$5.0 million of Interim Notes, as described in Note 4 — *Debt*, which included two notes to investors who were related to two of the Company's officers in the aggregate amount of \$0.2 million. The April 2016 Interim Notes issuances also included three notes to investors who were related to three of the Company's directors in the aggregate amount of \$2.3 million.

The IPO included 154,450 shares sold to 5 officers and 3 board members, totaling \$1.5 million. In addition, 500,000 shares were sold to 1 investor who is related to 1 of the Company's directors, totaling \$5.0 million, and 47,000 shares totaling \$0.5 million were sold to 14 investors who are related to 5 officers of the Company.

15. Subsequent Events

On March 10 2017, the Company entered into a securities purchase agreement for a private placement with a select group of accredited investors whereby, on March 15, 2017 the Company 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 the Company's 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. The private placement included 56,678 units sold to 3 board members, for aggregate proceeds totaling approximately \$0.5 million and 52,798 units sold to 1 investor who is related to 1 board member, for proceeds totaling approximately \$0.5 million.

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The securities were issued and sold in the private placement have not been registered under the Securities Act of 1933, as amended, or state securities laws, and may not be offered or sold in the United States absent registration with the SEC or an applicable exemption from such registration requirements. The Company have agreed to file a registration statement with the SEC covering the resale of the shares of common stock issued in the private placement and issuable upon exercise of the warrant issued in the private placement.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures that are designed to ensure that information we are required to disclose in our Exchange Act reports is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

We designed and evaluate our disclosure controls and procedures recognizing that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance and not absolute assurance of achieving the desired control objectives. Also, the design of a control system must reflect the fact that there are resource constraints and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty and that breakdowns can occur because of simple error or mistake. The design of any system of controls is based, in part, upon certain assumptions about the likelihood of future events and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions.

Under the supervision of and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we evaluated the effectiveness of our disclosure controls and procedures, as such term is defined in Rules 13a-15(e) and 15(d)-15(e) promulgated under the Securities Exchange Act of 1934, as amended (the "Exchange Act") as of December 31, 2016. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2016.

Management's Annual Report on Internal Control Over Financial Reporting

This annual report does not include a report of management's assessment regarding internal control over financial reporting or an attestation report of our registered public accounting firm due to a transition period established by rules of the SEC for newly public companies.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) during the quarter ended December 31, 2016, that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this Item is included in and incorporated by reference from the Company's Definitive Proxy Statement (the "Proxy Statement") for our 2017 Annual Meeting of Stockholders, which will be filed by the Company with the SEC within 120 days of the end of the fiscal year covered by this Report.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this Item is included in and incorporated by reference from the Proxy Statement.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this Item is included in and incorporated by reference from the Proxy Statement.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

The information required by this Item is included in and incorporated by reference from the Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this Item is included in and incorporated by reference from the Proxy Statement.

PART IV**ITEM 15. EXHIBITS and FINANCIAL STATEMENT SCHEDULES**

(a) The following documents are filed as part of this report:

1. Financial Statements

See Index to Financial Statements at Item 8 herein.

2. Financial Statement Schedules

**SCHEDULE II
VALUATION AND QUALIFYING ACCOUNTS**

<u>Description</u>	<u>Beginning Balance of Period</u>	<u>Additions</u>		<u>Releases</u>	<u>Ending Balance of Period</u>
		<u>Charged to Costs and Expenses</u>	<u>Charged to Paid in Capital</u>		
(in thousands)					
For the Year Ended December 31, 2014					
Valuation allowance for deferred taxes	\$ —	\$ 72	\$ —	\$ —	\$ 72
For the Year Ended December 31, 2015					
Valuation allowance for deferred taxes	\$ 72	\$ 3,447	\$ 138	\$ —	\$ 3,657
For the Year Ended December 31, 2016					
Valuation allowance for deferred taxes	\$ 3,657	\$ 5,937	\$ (274)	\$ —	\$ 9,320

No other financial statement schedules are provided because the information called for is not required or is shown either in the financial statements or notes thereto.

3. Exhibits:

EXHIBIT NUMBER	DESCRIPTION OF DOCUMENT
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).
10.1*	Form of Indemnification Agreement (incorporated by reference to Exhibit 10.1 to the Registrant's Registration Statement on Form S-1, File No. 333-210815, filed on April 18, 2016).
10.2*	Form of Amended and Restated 2015 Equity Incentive Plan (incorporated by reference to Exhibit 10.3 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.3*	Form of 2016 Employee Stock Purchase Plan (incorporated by reference to Exhibit 10.4 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.4*	Employment Agreement by and between the Registrant and Mina Sooch (incorporated by reference to Exhibit 10.5 to the Registrant's Registration Statement on Form S-1, File No. 333-210815, filed on April 18, 2016).
10.5*	Employment Agreement by and between the Registrant and Jeffrey S. Mathiesen (incorporated by reference to Exhibit 10.6 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.6*	Employment Agreement by and between the Registrant and Charles L. Bisgaier (incorporated by reference to Exhibit 10.7 to the Registrant's Registration Statement on Form S-1, File No. 333-210815, filed on April 18, 2016).
10.7*	Form of Executive Officer Employment Agreement (incorporated by reference to Exhibit 10.8 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.8+	License Agreement, dated April 16, 2011, by and between the Registrant and Pfizer Inc. (incorporated by reference to Exhibit 10.9 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.9	Office Space Sublease Agreement, dated as of January 1, 2015, by and between the Registrant and Michigan Life Ventures, LLC, as amended on May 6, 2015, August 31, 2015, September 25, 2015, October 23, 2015, December 16, 2015 and March 4, 2016 (incorporated by reference to Exhibit 10.10 to the Registrant's Registration Statement on Form S-1, File No. 333-210815, filed on April 18, 2016).
10.10	Lease Agreement, dated as of May 18, 2016 and commencing on August 1, 2016, by and between the Registrant and North Laurel Project, LLC (incorporated by reference to Exhibit 10.11 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.11	Form of Note Purchase Agreement dated July 31, 2015 as amended on December 10, 2015, March 27, 2016 and April 14, 2016 (incorporated by reference to Exhibit 10.12 to the Registrant's Registration Statement on Form S-1, File No. 333-210815, filed on April 18, 2016).
10.12	Form of Joinder Agreement to Note Purchase Agreement (incorporated by reference to Exhibit 10.13 to the Registrant's Registration Statement on Form S-1, File No. 333-210815, filed on April 18, 2016).

10.13	Fourth Amendment to Note Purchase Agreement and Convertible Promissory Notes dated April 26, 2016 (incorporated by reference to Exhibit 10.14 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.14*	Non-Employee Director Compensation Policy (incorporated by reference to Exhibit 10.15 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.15*	Gemphire Therapeutics Inc. Inducement Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, File No. 001-37809, filed on October 3, 2016).
10.16*	Form of Stock Option Grant Notice, Option Agreement and Notice of Exercise under the Gemphire Therapeutics Inc. Inducement Plan (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K, File No. 001-37809, filed on October 3, 2016).
23.1	Consent of Ernst & Young LLP.
31.1	Certification of Principal Executive Officer Pursuant to Exchange Act Rule 13a-14(a) or 15d-14(a), as Adopted Pursuant to Section 302 of The Sarbanes Oxley Act of 2002
31.2	Certification of Principal Financial Officer Pursuant to Exchange Act Rule 13a-14(a) or 15d-14(a), as Adopted Pursuant to Section 302 of The Sarbanes Oxley Act of 2002
32.1	Certifications of Chief Executive Officer and Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
*	Indicates management contract or compensatory plan.
+	Registrant has omitted and filed separately with the SEC portions of the exhibit pursuant to a confidential treatment request under Rule 406 promulgated under the Securities Act.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Date: March 20, 2017

GEMPHIRE THERAPEUTICS INC.

By: /S/ MINA SOOCH
Mina Sooch
President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

<u>SIGNATURE</u>	<u>TITLE</u>	<u>DATE</u>
<u>/s/ MINA SOOCH</u> Mina Sooch	President and Chief Executive Officer (Principal Executive Officer)	March 20, 2017
<u>/s/ JEFFREY S. MATHIESEN</u> Jeffrey S. Mathiesen	Chief Financial Officer (Principal Financial and Accounting Officer)	March 20, 2017
<u>/s/ CHARLES L. BISGAIER, Ph.D.</u> Charles L. Bisgaier, Ph.D.	Chief Scientific Officer and Chairman of the Board of Directors	March 20, 2017
<u>/s/ STEVE GULLANS, Ph.D.</u> Steve Gullans, Ph.D.	Member of the Board of Directors	March 20, 2017
<u>/s/ P. KENT HAWRYLUK</u> P. Kent Hawryluk	Member of the Board of Directors	March 20, 2017
<u>/s/ KENNETH KOUSKY</u> Kenneth Kousky	Member of the Board of Directors	March 20, 2017
<u>/s/ PEDRO LICHTINGER</u> Pedro Lichtinger	Member of the Board of Directors	March 20, 2017
<u>/s/ ANDREW SASSINE</u> Andrew Sassine	Member of the Board of Directors	March 20, 2017

EXHIBIT INDEX

EXHIBIT NUMBER	DESCRIPTION OF DOCUMENT
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).
10.1*	Form of Indemnification Agreement (incorporated by reference to Exhibit 10.1 to the Registrant's Registration Statement on Form S-1, File No. 333-210815, filed on April 18, 2016).
10.2*	Form of Amended and Restated 2015 Equity Incentive Plan (incorporated by reference to Exhibit 10.3 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.3*	Form of 2016 Employee Stock Purchase Plan (incorporated by reference to Exhibit 10.4 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.4*	Employment Agreement by and between the Registrant and Mina Sooch (incorporated by reference to Exhibit 10.5 to the Registrant's Registration Statement on Form S-1, File No. 333-210815, filed on April 18, 2016).
10.5*	Employment Agreement by and between the Registrant and Jeffrey S. Mathiesen (incorporated by reference to Exhibit 10.6 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
10.6*	Employment Agreement by and between the Registrant and Charles L. Bisgaier (incorporated by reference to Exhibit 10.7 to the Registrant's Registration Statement on Form S-1, File No. 333-210815, filed on April 18, 2016).
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Gemphire Therapeutics Inc.
(Formerly Known as Michigan Life Therapeutics, LLC)
Form 10-Q

10.13	Fourth Amendment to Note Purchase Agreement and Convertible Promissory Notes dated April 26, 2016 (incorporated by reference to Exhibit 10.14 to the Registrant's Amendment No. 1 to the Registration Statement on Form S-1, File No. 333-210815, filed on June 13, 2016).
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101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
*	Indicates management contract or compensatory plan.
+	Registrant has omitted and filed separately with the SEC portions of the exhibit pursuant to a confidential treatment request under Rule 406 promulgated under the Securities Act.

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Gemphire Therapeutics Inc.
Livonia, Michigan

We consent to the incorporation by reference in the Registration Statements (Form S-8 Nos. 333-213946 and 333-213014) of Gemphire Therapeutics Inc. of our report dated March 20, 2017, with respect to the financial statements and schedule of Gemphire Therapeutics Inc. included in the Annual Report on Form 10-K for the year ended December 31, 2016.

/s/ ERNST & YOUNG LLP

Detroit, Michigan
March 20, 2017

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO EXCHANGE ACT RULE 13a-14(a) OR 15d-14(a), AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES OXLEY ACT OF 2002**

I, Mina Sooch, certify that:

1. I have reviewed this annual report on Form 10-K of Gemphire Therapeutics Inc. for the period ended December 31, 2016;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations, and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) [Intentionally Omitted];
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's Board of Directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 20, 2017

/s/ MINA SOOCH

Name: Mina Sooch

Title: President and Chief Executive Officer
(Principal Executive Officer)

**CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO EXCHANGE ACT RULE 13a-14(a) OR 15d-14(a), AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES OXLEY ACT OF 2002**

I, Jeffrey S. Mathiesen, certify that:

1. I have reviewed this annual report on Form 10-K of Gemphire Therapeutics Inc. for the period ended December 31, 2016;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations, and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) [Intentionally Omitted];
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's Board of Directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 20, 2017

/s/ JEFFREY S. MATHIESEN

Name: Jeffrey S. Mathiesen

Title: Chief Financial Officer
(Principal Financial Officer)

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER AND PRINCIPAL FINANCIAL OFFICER,
PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE
SARBANES-OXLEY ACT OF 2002***

Pursuant to the requirement set forth in Rule 13a-14(b) or Rule 15d-14(b) of the Securities and Exchange Act of 1934, as amended (the "Exchange Act"), and Section 1350 of Chapter 63 of Title 18 of the United States Code, Mina Sooch, President and Chief Executive Officer of Gemphire Therapeutics Inc. (the "Company"), and Jeffrey S. Mathiesen, Chief Financial Officer of the Company, each hereby certify that, to the best of their knowledge:

1. The Company's Annual Report on Form 10-K for the period ended December 31, 2016, to which this Certification is attached as Exhibit 32.1 (the "Annual Report") fully complies with the requirements of Section 13(a) or Section 15(d) of the Exchange Act, and
2. The information contained in the Annual Report fairly presents, in all material respects, the financial condition of the Company at the end of the period covered by the Annual Report and results of operations of the Company for the period covered by the Annual Report.

/s/ MINA SOOCH
President and Chief Executive Officer

/s/ JEFFREY S. MATHIESEN
Chief Financial Officer

Dated: March 20, 2017

Dated: March 20, 2017

This certification accompanies the report to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Gemphire Therapeutics Inc. under the Securities Act of 1933, as amended, or the Exchange Act made before or after the date of the report, irrespective of any general incorporation language contained in such filing.
