



This free writing prospectus relates only to the securities described below and should be read together with the preliminary prospectus dated June 13, 2016 relating to this offering (the "Preliminary Prospectus") included in Amendment No. 1 to the Registration Statement on Form S-1 (File No. 333-210815) of Gemphire Therapeutics Inc. relating to these securities.

The Preliminary Prospectus can be accessed through the following link:
<https://www.sec.gov/Archives/edgar/data/1638287/000104746916013774/a2228362zs-1a.htm>. The following information supplements and updates and, to the extent inconsistent, supersedes the information contained in the Preliminary Prospectus. You should read the entire Preliminary Prospectus carefully, especially the "Risk Factors" section and the financial statements and related notes, before deciding to invest in these securities. Unless otherwise stated or the context otherwise requires, references in this free writing prospectus to "we," "us," "the Company" and "our" refer to Gemphire Therapeutics Inc.

Issuer: Gemphire Therapeutics Inc.

Common stock offered by us in this offering: 3,000,000 shares (or 3,450,000 shares if the underwriters' option to purchase additional shares is exercised in full)

Public offering price: \$10.00 per share

Joint Book-Running Managers: Jefferies LLC
RBC Capital Markets, LLC

Co-Lead Manager: Canaccord Genuity Inc.

Co-Managers: Laidlaw & Company (UK) Ltd.
LifeSci Capital LLC

Potential insider participation: Certain of our existing security holders, their affiliated entities, other entities and individuals associated with us and them, have indicated an interest in purchasing approximately \$10 million of shares (or 1 million shares) in the aggregate of our common stock in this offering at the initial public offering price. However, because indications of interest are not binding agreements or commitments to purchase, the underwriters may determine to sell more, fewer or no shares in this offering to any of these parties, or any of these parties may determine to purchase more, fewer or no shares in this offering. The underwriters will receive the same underwriting discount on any shares purchased by these entities as they will on any other shares sold to the public in this offering.

Directed share program: At our request, the underwriters have reserved up to 10% of the shares of our common stock offered by this prospectus for sale, at the initial public offering price, to our directors, officers, employees and other individuals associated with us and members of their respective families. We do not know if these persons will choose to purchase all or any portion of these reserved shares, but any purchases they do make will reduce the number of shares available to the general public. The underwriters will receive the same underwriting discount on any shares purchased by these investors as they will on any other shares sold to the public in this offering. Any shares purchased by such investors will be subject to the lock-up restrictions described in the section titled "Underwriting" in the Preliminary Prospectus.

Insider ownership: Immediately following the closing of this offering, disregarding any shares of common stock that they purchase in this offering or receive in connection with equity awards granted in connection with this offering, our officers, directors, five percent or greater stockholders and their respective affiliates will have beneficial ownership, in the aggregate, of approximately 48.0% of our outstanding common stock, assuming no exercise of the underwriters' option to acquire additional common stock in this offering. If certain of our existing stockholders and their affiliated entities purchase all of the shares they have indicated an interest in purchasing in this offering, then our officers, directors, five percent or greater stockholders and their respective affiliates will beneficially own, in the aggregate, approximately 55.0% of our outstanding common stock immediately following the closing of this offering.

Common stock to be outstanding after this offering: The number of shares of our common stock to be outstanding after this offering (8,431,615 shares (or 8,881,615 shares if the underwriters' option to purchase additional shares is exercised in full)) is based on 5,431,615 shares of common stock outstanding as of March 31, 2016, which excludes:

- 302,842 shares of common stock issuable upon the exercise of stock options outstanding as of March 31, 2016 at a weighted-average exercise price of \$2.428 per share;
- 1,825,200 shares of common stock issuable upon the exercise of stock options with a per share exercise price equal to the initial public offering price to be granted to certain officers, directors, employees and consultants in connection with this offering;
- 269,522 shares of common stock reserved for future issuance under our 2015 Equity Incentive Plan (the 2015 Plan), which will be amended and restated in connection with this offering, and 150,000 shares of common stock reserved for future issuance under our 2016 Employee Stock Purchase Plan, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of common stock reserved for future issuance under these plans;
- shares of common stock issuable upon conversion of our convertible notes issued after March 31, 2016, which notes and accrued and unpaid interest thereon will automatically convert immediately prior to the closing of this offering into 765,052 shares (assuming an expected closing date of August 10, 2016);
- 24,257 shares of common stock issuable upon the automatic conversion of the accrued and unpaid interest that accrued after March 31, 2016 and through the expected closing date of August 10, 2016 on our convertible notes issued prior to March 31, 2016; and
- 21,576 shares of common stock issued immediately prior to the closing of the offering pursuant to the Accrued Dividends described elsewhere in this prospectus in the section titled “Dividend Policy” that accrued after March 31, 2016 and through the expected closing date of August 10, 2016.

Unless otherwise indicated, all information contained in this prospectus assumes the following:

- the conversion of all of our convertible preferred stock outstanding as of March 31, 2016 into 745,637 shares of common stock immediately prior to the closing of this offering;
- a 1-for-3.119 reverse split of our common stock and preferred stock, which became effective on April 27, 2016;
- the issuance of 59,992 shares of common stock pursuant to the Accrued Dividends described elsewhere in this prospectus in the section titled “Dividend Policy” immediately prior to the closing of the offering (assuming the closing of the offering occurred on March 31, 2016);
- the automatic conversion of the principal and accrued and unpaid interest outstanding as of March 31, 2016 on our convertible notes issued prior to March 31, 2016 into 867,498 shares of common stock immediately prior to the closing of the offering;
- no exercise by the underwriters of their option to purchase up to an additional 450,000 shares of our common stock; and
- the filing of our amended and restated certificate of incorporation and the adoption of our amended and restated bylaws immediately prior to the closing of this offering.

Pro forma as adjusted balance sheet data:

The summary pro forma as adjusted balance sheet data appearing on page 11 of the Preliminary Prospectus is updated as follows: As of March 31, 2016 on a pro forma as adjusted basis, our cash and cash equivalents would have been approximately \$27.2 million, our working capital would have been approximately \$25.0 million, our total assets would have been approximately \$27.3 million, and our total stockholders’ equity would have been approximately \$25.0 million, in each case after giving effect to the following transactions (which we collectively refer to herein as the Pro Forma As Adjusted Transactions):

- the automatic conversion of all outstanding shares of our convertible preferred stock into 745,637 shares of common stock immediately prior to the closing of this offering;
- the issuance of 59,992 shares of common stock immediately prior to the closing of the offering pursuant to the Accrued Dividends described elsewhere in this prospectus in the section titled “Dividend Policy” (assuming the closing of the offering occurred on March 31, 2016);
- the issuance of 867,498 shares of common stock pursuant to the automatic conversion of the principal and accrued and unpaid interest outstanding on our convertible notes issued prior to March 31, 2016, immediately prior to the closing of this offering;

- the accelerated vesting of 162,945 shares of restricted stock unvested as of March 31, 2016 valued at approximately \$14,000 held by certain employees upon the closing of this offering;
- the filing of our amended and restated certificate of incorporation immediately prior to the closing of this offering; and
- the issuance and sale of 3,000,000 shares of common stock in this offering at the initial public offering price of \$10.00 per share, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us.

The Pro Forma As Adjusted Transactions described above do not include: (i) our convertible notes that were issued after March 31, 2016, which notes and accrued and unpaid interest thereon will automatically convert immediately prior to the closing of this offering into 765,052 shares of common stock (assuming an expected closing date of August 10, 2016); (ii) 24,257 shares of common stock

issuable upon the automatic conversion of the accrued and unpaid interest that accrued after March 31, 2016 and through the expected closing date of August 10, 2016 on our convertible notes issued prior to March 31, 2016; or (iii) 21,576 shares of common stock issued immediately prior to the closing of the offering pursuant to the Accrued Dividends described elsewhere in this prospectus in the section titled "Dividend Policy" that accrued after March 31, 2016 and through the expected closing date of August 10, 2016.

Use of proceeds:

We estimate that we will receive net proceeds of approximately \$25.6 million (or approximately \$29.8 million if the underwriters exercise their option to purchase additional shares in full) from the sale of the shares of common stock offered by us in this offering, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us. We intend to use the net proceeds from this offering, together with cash and cash equivalents, for the following purposes: approximately \$20.0 million to fund development costs associated with our three late stage clinical trials of gemcabene for our target indications and for costs associated with our planned End of Phase 2 (EOP2) meetings with the FDA; approximately \$4.0 million to fund manufacturing-related activities for gemcabene; approximately \$3.5 million to fund development costs associated with preclinical studies and related activities for gemcabene; and the balance for general corporate purposes, including working capital, general administrative costs, potential acquisition or in-licensing costs and the prosecution and maintenance of our intellectual property. See "Use of Proceeds" in the Preliminary Prospectus.

Pro forma as adjusted capitalization:

Based on our sale of 3,000,000 shares of common stock at an initial public offering price of \$10 per share, the information appearing under the caption "Capitalization" appearing on page 62 of the Preliminary Prospectus is updated as follows: As of March 31, 2016 on a pro forma as adjusted basis, our cash and cash equivalents would have been approximately \$27.2 million, our additional paid in capital would have been approximately \$39.5 million, our total stockholders' equity would have been approximately \$25.0 million and our total capitalization would have been approximately \$52.2 million, in each case after giving effect to the Pro Forma As Adjusted Transactions described above.

In addition, the number of pro forma as adjusted shares of preferred stock and common stock appearing in the preferred stock and common stock line items in the table on page 62 of the Preliminary Prospectus are updated as follows: after giving effect to the filing of our amended and restated certificate of incorporation as if the filing had occurred as of March 31, 2016, our pro forma as adjusted authorized capital stock would have consisted of 10,000,000 shares of preferred stock, \$0.001 par value per share, and 100,000,000 shares of common stock, \$0.001 par value per share; and, after giving effect to the Pro Forma As Adjusted Transactions described above, no shares of preferred stock and 8,431,615 shares of our common stock would have been issued and outstanding on a pro forma as adjusted basis as of that date.

Dilution:

The information appearing under the caption "Dilution" on pages 64 and 65 of the Preliminary Prospectus is updated as follows: On a pro forma as adjusted basis as of March 31, 2016, after giving effect to the Pro Forma As Adjusted Transactions described above as if they had occurred as of that date, the pro forma as adjusted net tangible book value would have been approximately \$25.0 million, or \$2.97 per share of our common stock. This represents an immediate increase in pro forma net tangible book value of \$3.08 per share to our existing stockholders and an immediate dilution of \$7.03 per share to investors purchasing shares in this offering.

If the underwriters exercise in full their option to purchase 450,000 additional shares of our common stock in this offering, the pro forma as adjusted net tangible book value per share after this offering will increase to \$3.29 per share, representing an immediate increase in pro forma as adjusted net tangible book value to existing stockholders of \$3.40 per share and an immediate decrease of dilution of \$6.71 per share to new investors participating in this offering.

In addition, investors purchasing common stock in this offering will contribute approximately 75.3% of the total amount invested by stockholders since inception but will only own approximately 35.6% of the shares of common stock outstanding.

We have filed a registration statement (including a prospectus) with the SEC for the offering to which this communication relates. Before you invest, you should read the prospectus and other documents we have filed with the SEC for more complete information about us and this offering. You may get these documents for free by visiting EDGAR on the SEC Web site at www.sec.gov. Alternatively, we or any underwriter or any dealer participating in this offering will arrange to send you the prospectus if you request it by contacting Jefferies LLC, Attention: Equity Syndicate Prospectus Department, 520 Madison Avenue, 2nd Floor, New York, NY 10022, or by telephone at (877) 547-6340, or by email at Prospectus_Department@Jefferies.com; or from RBC Capital Markets, LLC, Attention: Equity Syndicate, 200 Vesey Street, 8th Floor, New York, NY 10281, or by telephone at (877) 822-4089, or by email at equityprospectus@rbccm.com.
