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

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**FORM S-8  
REGISTRATION STATEMENT  
UNDER  
THE SECURITIES ACT OF 1933**

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**Aerpio Pharmaceuticals, Inc.**

(Exact Name of Registrant as Specified in Its Charter)

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**Delaware**  
(State or Other Jurisdiction of  
Incorporation or Organization)

**61-1547850**  
(I.R.S. Employer  
Identification Number)

**Aerpio Pharmaceuticals, Inc.**  
**9987 Carver Road, Suite 420**  
**Cincinnati, OH**  
(Address of Principal Executive Offices)

**45242**  
(Zip Code)

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**2017 Stock Option and Incentive Plan  
Amended and Restated 2017 Employee Stock Purchase Plan**  
(Full Title of the Plan)

**Joseph Gardner**  
**President**  
**Aerpio Pharmaceuticals, Inc.**  
**9987 Carver Road, Suite 420**  
**Cincinnati, OH 45242**  
(Name and Address of Agent for Service)

**(513) 985-1920**  
(Telephone Number, Including Area Code, of Agent For Service)

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*Copies to:*

**Kingsley L. Taft, Esq.**  
**Danielle M. Lauzon, Esq.**  
**James Xu, Esq.**  
**Goodwin Procter LLP**  
**100 Northern Avenue**  
**Boston, Massachusetts 02210**  
**(617) 570-1000**

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

Large accelerated filer   
Non-accelerated filer

Accelerated filer   
Smaller reporting company   
Emerging growth company

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

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**CALCULATION OF REGISTRATION FEE**

Title of Securities To Be Registered	Amount To Be Registered (1)	Proposed Maximum Offering Price Per Share	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee (6)
Common Stock, par value \$0.0001 per share	1,623,520 shares(2)	\$0.60(3)	\$974,112	\$126.44
Common Stock, par value \$0.0001 per share	350,000 shares(4)	\$0.51(5)	\$178,500	\$23.17
Total	1,973,520 shares		\$1,152,612	\$149.61

- (1) In accordance with Rule 416(a) under the Securities Act of 1933, as amended (the “Securities Act”), this Registration Statement shall be deemed to cover any additional shares of Common Stock that may become issuable under the Registrant’s 2017 Stock Option and Incentive Plan (the “2017 Plan”) and Amended and Restated 2017 Employee Stock Purchase Plan (the “2017 ESPP”) resulting from stock splits, stock dividends, recapitalizations or similar transactions effected without the receipt of consideration which results in an increase in the number of the Registrant’s outstanding shares of Common Stock.
- (2) Represents an automatic increase of 1,623,520 shares of the Registrant’s Common Stock to the number of shares available for issuance under the 2017 Plan, effective January 1, 2020. Shares available for issuance under the 2017 Plan were previously registered on a registration statement on Form S-8 filed with the Securities and Exchange Commission on August 18, 2017 (Registration No. 333-220057), on April 6, 2018 (Registration No. 333-224189) and on March 7, 2019 (Registration No. 333-230114).
- (3) The price of \$0.60 per share, which is the average of the high and low sale prices of the Common Stock of the Registrant as quoted on the Nasdaq Capital Market on March 10, 2020, is set forth solely for purposes of calculating the registration fee pursuant to Rules 457(c) and (h) of the Securities Act and has been used as these shares are without a fixed price.
- (4) Represents an automatic increase of 350,000 shares of the Registrant’s Common Stock to the number of shares available for issuance under the 2017 ESPP, effective January 1, 2020. Shares available for issuance under the 2017 ESPP were previously registered on a registration statement on Form S-8 filed with the Securities and Exchange Commission on August 18, 2017 (Registration No. 333-220057) and on March 7, 2019 (Registration No. 333-230114).
- (5) The price of \$0.51 per share, which is 85% of the average of the high and low sale prices of the Common Stock of the Registrant as quoted on the Nasdaq Capital Market on March 10, 2020, is set forth solely for purposes of calculating the registration fee pursuant to Rules 457(c) and (h) of the Securities Act and has been used as these shares are without a fixed price. Pursuant to the 2017 Employee Stock Purchase Plan, the purchase price of the shares of Common Stock reserved for issuance thereunder will be 85% of the fair market value of a share of Common Stock on the first trading day of the offering period or on the exercise date, whichever is less.
- (6) Calculated pursuant to Section 6(b) of the Securities Act.

## EXPLANATORY NOTE

This Registration Statement on Form S-8 relating to the 2017 Plan and the 2017 ESPP of Aerpio Pharmaceuticals, Inc. (the “Registrant”) registers additional securities of the same class as other securities for which the Registrant’s registration statement filed on Form S-8 (Registration No. 333-220057) on August 18, 2017 on Form S-8 (Registration No. 333-224189) on April 6, 2018 and on Form S-8 (Registration No. 333-230114) on March 7, 2019, are effective. Accordingly, the information contained in the Registrant’s Registration Statement on Form S-8 (SEC File No. 333-220057) is hereby incorporated by reference pursuant to General Instruction E, except for “Item 8. Exhibits” with respect to which the Exhibit Index is incorporated herein by reference.

### PART II

#### INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 8. Exhibits.

Exhibit No.	Description of Exhibit
4.1	<a href="#">Amended and Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.2 to the Registrant’s Form 8-K filed with the Securities and Exchange Commission on March 17, 2017, File No. 000-53057)</a>
4.2	<a href="#">Amended and Restated By-laws of the Registrant, as currently in effect (incorporated by reference to Exhibit 3.3 to the Registrant’s Form 8-K filed with the Securities and Exchange Commission on March 17, 2017, File No. 000-53057)</a>
4.3	<a href="#">Specimen Stock Certificate evidencing shares of common stock (incorporated herein by reference to Exhibit 4.2 to the Registrant’s Registration Statement on Form S-1 (File No. 333-217320) filed on April 14, 2017)</a>
4.4	<a href="#">Form of Warrant Agreement (incorporated herein by reference to Exhibit 4.1 to the Registrant’s Current Report on Form 8-K (File No. 000-53057) filed on March 17, 2017)</a>
5.1*	<a href="#">Opinion of Goodwin Procter LLP</a>
23.1*	<a href="#">Consent of Goodwin Procter LLP (included in Exhibit 5.1)</a>
23.2*	<a href="#">Consent of Ernst &amp; Young LLP</a>
24.1*	<a href="#">Power of Attorney (included as part of the signature page of this Registration Statement)</a>
99.1	<a href="#">2017 Stock Option and Incentive Plan and forms of award agreements thereunder (incorporated herein by reference to Exhibit 10.2 to the Registrant’s Current Report on Form 8-K (File No. 000-53057) filed on March 17, 2017)</a>
99.2	<a href="#">Amended and Restated 2017 Employee Stock Purchase Plan (incorporated herein by reference to Exhibit 10.1 to the Registrant’s Current Report on Form 8-K (File No. 000-53057) filed on December 18, 2017)</a>

## SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cincinnati, State of Ohio, on March 16, 2020.

### AERPIO PHARMACEUTICALS, INC.

By: /s/ Joseph Gardner, Ph.D.

Joseph Gardner, Ph.D.

*President and Principal Executive Officer*

## POWER OF ATTORNEY AND SIGNATURES

We, the undersigned officers and directors of Aerpio Pharmaceuticals, Inc. (the "Company"), hereby severally constitute and appoint Joseph Gardner and Regina Marek, and each of them singly, our true and lawful attorneys, with full power to them, and to each of them singly, to sign for us and in our names in the capacities indicated below, any and all amendments (including post-effective amendments) to this Registration Statement, and all other documents in connection therewith to be filed with the Securities and Exchange Commission, and generally to do all things in our names and on our behalf in such capacities to enable the Company to comply with the provisions of the Securities Act of 1933, as amended, and all requirements of the Securities and Exchange Commission.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed by the following persons in the capacities and on the date indicated.

Signature	Title(s)	Date
<u>/s/ Joseph Gardner, Ph.D.</u> Joseph Gardner, Ph.D.	<i>President, Founder and Director (Principal Executive Officer)</i>	March 16, 2020
<u>/s/ Regina Marek</u> Regina Marek	<i>Vice President, Finance (Principal Financial and Accounting Officer)</i>	March 16, 2020
<u>/s/ Muneer A. Satter</u> Muneer A. Satter	<i>Chairman of the Board of Directors</i>	March 16, 2020
<u>/s/ Chau Khuong</u> Chau Khuong	<i>Director</i>	March 16, 2020
<u>/s/ Cheryl Cohen</u> Cheryl Cohen	<i>Director</i>	March 16, 2020
<u>/s/ Anupam Dalal, M.D.</u> Anupam Dalal, M.D.	<i>Director</i>	March 16, 2020
<u>/s/ Caley Castelein, M.D.</u> Caley Castelein, M.D.	<i>Director</i>	March 16, 2020
<u>/s/ Pravin Dugel, M.D.</u> Pravin Dugel, M.D.	<i>Director</i>	March 16, 2020
<u>/s/ Steven Prelack</u> Steven Prelack	<i>Director</i>	March 16, 2020



Goodwin Procter LLP  
100 Northern Avenue  
Boston, MA 02210  
goodwinlaw.com  
+1 617 570 1000

March 16, 2020

Aerpio Pharmaceuticals, Inc.  
9987 Carver Road, Suite 420  
Cincinnati, OH 45242

Re: Securities Being Registered under Registration Statement on Form S-8

We have acted as counsel to you in connection with your filing of a Registration Statement on Form S-8 (as amended or supplemented, the "Registration Statement") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), on or about the date hereof relating to an aggregate of 1,973,520 shares (the "Shares") of Common Stock, \$0.0001 par value per share ("Common Stock"), of Aerpio Pharmaceuticals, Inc., a Delaware corporation (the "Company"), that may be issued pursuant to the Company's 2017 Stock Option and Incentive Plan and Amended and Restated 2017 Employee Stock Purchase Plan (collectively, the "Plans").

We have reviewed such documents and made such examination of law as we have deemed appropriate to give the opinions set forth below. We have relied, without independent verification, on certificates of public officials and, as to matters of fact material to the opinion set forth below, on certificates of officers of the Company.

The opinion set forth below is limited to the Delaware General Corporation Law.

For purposes of the opinion set forth below, we have assumed that no event occurs that causes the number of authorized shares of Common Stock available for issuance by the Company to be less than the number of then unissued Shares.

Based on the foregoing, we are of the opinion that the Shares have been duly authorized and, upon issuance and delivery against payment therefor in accordance with the terms of the Plans, will be validly issued, fully paid and nonassessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the Registration Statement. In giving our consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations thereunder.

Very truly yours,

/s/ Goodwin Procter LLP

GOODWIN PROCTER LLP

**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We consent to the incorporation by reference in the Registration Statement (Form S-8) pertaining to the Aerpio Pharmaceuticals, Inc. 2017 Stock Option and Incentive Plan, and Aerpio Pharmaceuticals, Inc. Amended and Restated 2017 Employee Stock Purchase Plan, of our report dated March 16, 2020, with respect to the consolidated financial statements of Aerpio Pharmaceuticals, Inc., included in the Annual Report (Form 10-K) for the year ended December 31, 2019, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Cincinnati, Ohio  
March 16, 2020