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UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, DC 20549

SCHEDULE 13G

Under the Securities Exchange Act of 1934  
(Amendment No. )\*

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**Aeglea BioTherapeutics, Inc.**

(Name of Issuer)

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**Common Stock**

(Title of Class of Securities)

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**00773J103**

(CUSIP Number)

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**April 7, 2016**

(Date of Event Which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

- Rule 13d-1(b)
- Rule 13d-1(c)
- Rule 13d-1(d)

\*The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter the disclosures provided in a prior cover page.

The information required in the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

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1	NAME OF REPORTING PERSONS I.R.S. IDENTIFICATION NO. OF ABOVE PERSONS (ENTITIES ONLY)  OrbiMed Capital GP V LLC	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (See Instructions) (a) <input type="radio"/> (b) <input type="radio"/>	
3	SEC USE ONLY	
4	CITIZENSHIP OR PLACE OF ORGANIZATION  Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER  0
	6	SHARED VOTING POWER  1,360,224
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  1,360,224
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  1,360,224	
10	CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES (See Instructions) <span style="float: right;">0</span>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  10.14%*	
12	TYPE OF REPORTING PERSON (See Instructions)  OO	

\*This percentage is calculated based upon 13,411,772 of the Issuer's Common Stock outstanding as set forth in the Issuer's final prospectus, dated April 6, 2016, filed with the Securities and Exchange Commission on April 7, 2016, and taking into account the underwriters' purchase of 481,940 shares of Common Stock pursuant to partial exercise of their over-allotment option, as announced by the Issuer on April 12, 2016.

1	NAME OF REPORTING PERSONS I.R.S. IDENTIFICATION NO. OF ABOVE PERSONS (ENTITIES ONLY)  OrbiMed Advisors LLC	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (See Instructions) (a) <input type="radio"/> (b) <input type="radio"/>	
3	SEC USE ONLY	
4	CITIZENSHIP OR PLACE OF ORGANIZATION  Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER  0
	6	SHARED VOTING POWER  1,360,224
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  1,360,224
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  1,360,224	
10	CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES (See Instructions) <span style="float: right;">0</span>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  10.14%*	
12	TYPE OF REPORTING PERSON (See Instructions)  IA	

\*This percentage is calculated based upon 13,411,772 of the Issuer's Common Stock outstanding as set forth in the Issuer's final prospectus, dated April 6, 2016, filed with the Securities and Exchange Commission on April 7, 2016, and taking into account the underwriters' purchase of 481,940 shares of Common Stock pursuant to partial exercise of their over-allotment option, as announced by the Issuer on April 12, 2016.

1	NAME OF REPORTING PERSONS I.R.S. IDENTIFICATION NO. OF ABOVE PERSONS (ENTITIES ONLY)  Samuel D. Isaly	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (See Instructions) (a) <input type="radio"/> (b) <input type="radio"/>	
3	SEC USE ONLY	
4	CITIZENSHIP OR PLACE OF ORGANIZATION  United States	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER  0
	6	SHARED VOTING POWER  1,360,224
	7	SOLE DISPOSITIVE POWER  0
	8	SHARED DISPOSITIVE POWER  1,360,224
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  1,360,224	
10	CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES (See Instructions) <span style="float: right;">0</span>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)  10.14%*	
12	TYPE OF REPORTING PERSON (See Instructions)  IN	

\*This percentage is calculated based upon 13,411,772 of the Issuer's Common Stock outstanding as set forth in the Issuer's final prospectus, dated April 6, 2016, filed with the Securities and Exchange Commission on April 7, 2016, and taking into account the underwriters' purchase of 481,940 shares of Common Stock pursuant to partial exercise of their over-allotment option, as announced by the Issuer on April 12, 2016.

**Item 1. (a) Name of Issuer:**

Aeglea BioTherapeutics, Inc.

**(b) Address of Issuer's Principal Executive Offices:**

901 S. MoPac Expressway, Barton Oaks Plaza One, Ste. 250, Austin, TX 78746

**Item 2. (a) Name of Person Filing:**

This Schedule 13G is being filed by each of the following persons (each a "Reporting Person", and together, the "Reporting Persons"):

- (i) OrbiMed Capital GP V LLC ("GP V")
- (ii) OrbiMed Advisors LLC ("Advisors")
- (iii) Samuel D. Isaly ("Isaly")

See Exhibit A for the Reporting Persons' agreement for a joint filing of a single statement on their behalf.

**(b) Address of Principal Business Office:**

601 Lexington Avenue, 54th Floor

New York, NY 10022

**(c) Citizenship:**

Please refer to Item 4 on each cover sheet for each filing person.

**(d) Title of Class of Securities:**

Common Stock

**(e) CUSIP No.:**

00773J103

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**Item 3.**

Not Applicable

**Item 4. Ownership:**

GP V is the sole general partner of OrbiMed Private Investments V, LP (“OPI V”), which holds 1,360,224 shares of Common Stock (“Shares”). Advisors is an investment advisor in accordance with Rule 13d-1(b)(1)(ii)(E) under the Securities Exchange Act of 1934, as amended (the “Act”), and is the Managing Member of GP V. Isaly is the Managing Member of Advisors and a control person in accordance with Rule 13d-1(b)(1)(ii)(G) under the Act. On the basis of these relationships, GP V, Advisors and Isaly may be deemed to share beneficial ownership of the Shares held by OPI V.

- (a) Amount beneficially owned: See the response(s) to Item 9 on the attached cover page(s).
- (b) Percent of class: See the response(s) to Item 11 on the attached cover page(s).
- (c) Number of shares as to which such person has:
  - (i) Sole power to vote or to direct the vote: See the response(s) to Item 5 on the attached cover page(s).
  - (ii) Shared power to vote or to direct the vote: See the response(s) to Item 6 on the attached cover page(s).
  - (iii) Sole power to dispose or to direct the disposition of: See the response(s) to Item 7 on the attached cover page(s).
  - (iv) Shared power to dispose or to direct the disposition of: See the response(s) to Item 8 on the attached cover page(s).

**Item 5. Ownership of Five Percent or Less of a Class.**

Not Applicable.

**Item 6. Ownership of More Than Five Percent on Behalf of Another Person.**

See Item 4.

**Item 7. Identification and Classification of the Subsidiary which Acquired the Security Being Reported on by the Parent Holding Company or Control Person.**

Not Applicable.

**Item 8. Identification and Classification of Members of the Group.**

Not Applicable.

**Item 9. Notice of Dissolution of Group.**

Not Applicable.

**Item 10. Certification.**

By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were acquired and held in the ordinary course of business and were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of the issuer of the securities and were not acquired and are not held in connection with or as a participant in any transaction having that purpose or effect.

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**SIGNATURES**

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

Dated: April 18, 2016

OrbiMed Capital GP V LLC

By: OrbiMed Advisors LLC, its Managing Member

By: /s/ Samuel D. Isaly

Name: Samuel D. Isaly

Title: Managing Member

OrbiMed Advisors LLC

By: /s/ Samuel D. Isaly

Name: Samuel D. Isaly

Title: Managing Member

Samuel D. Isaly

/s/ Samuel D. Isaly

Name: Samuel D. Isaly

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**EXHIBIT A  
JOINT FILING AGREEMENT**

The undersigned hereby agree that the Statement on this Schedule 13G dated April 18, 2016 (the "Schedule 13G"), with respect to the Common Stock of Aeglea BioTherapeutics, Inc. is filed on behalf of each of us pursuant to and in accordance with the provisions of Rule 13d-1(k) under the Securities Exchange Act of 1934, as amended, and that this Agreement shall be included as an Exhibit to this Schedule 13G. Each of the undersigned agrees to be responsible for the timely filing of the Schedule 13G, and for the completeness and accuracy of the information concerning itself contained therein. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the undersigned have executed this Agreement as of April 18, 2016.

OrbiMed Capital GP V LLC

By: OrbiMed Advisors LLC, its Managing Member

By: /s/ Samuel D. Isaly

Name: Samuel D. Isaly

Title: Managing Member

OrbiMed Advisors LLC

By: /s/ Samuel D. Isaly

Name: Samuel D. Isaly

Title: Managing Member

Samuel D. Isaly

/s/ Samuel D. Isaly

Name: Samuel D. Isaly

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