UNITED STATES SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

SCHEDULE 13G

UNDER THE SECURITIES EXCHANGE ACT OF 1934 (Amendment No.)*

REGENXBIO INC.

(Name of Issuer)

Common Stock, \$0.0001 par value (Title of Class of Securities)

75901B107 (CUSIP Number)

(CUSIP Number)
December 31, 2015 (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)
x 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).

CUSIP No. 75901B107 Page 2 of 18

_				
	Name of Reporting Persons Venrock Healthcare Capital Partners, L.P.			
		Appropriate Box if a Member of a Group (See Instructions)		
	(a) □ ($\hat{\mathbf{b}})$ $\hat{\mathbf{x}}^1$		
	SEC USE C			
4.	Citizenship	or Place of Organization		
	Delaware			
NT	h C	5. Sole Voting Power 0		
Sha Benef	ber of ares ficially ied by	 Shared Voting Power 1,083,454² 		
Ea Repo	ach orting n With:	7. Sole Dispositive Power 0		
		8. Shared Dispositive Power 1,083,454 ²		
	Aggregate <i>P</i> 1,083,454 ²	Amount Beneficially Owned by Each Reporting Person		
10.	Check if the	Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x ³		
	11. Percent of Class Represented by Amount in Row (9) 4.1% ⁴			
	12. Type of Reporting Person (See Instructions) PN			

- This Schedule 13G is being filed by Venrock Healthcare Capital Partners, L.P. ("VHCP I"), VHCP Co-Investment Holdings, LLC ("VHCP Co-Invest I"), Venrock Healthcare Capital Partners II, L.P. ("VHCP II"), VHCP Co-Investment Holdings II, LLC ("VHCP Co-Invest II"), VHCP Management, LLC ("VHCP Management"), VHCP Management II, LLC ("VHCP Management II" and collectively with VHCP I, VHCP Co-Invest I, VHCP II, VHCP Co-Invest II and VHCP Management, the "VHCP Entities"), Venrock Associates VII, L.P. ("VA7"), Venrock Partners VII, L.P. ("VP7") and Venrock Management VII, LLC ("VM7" and together with VA7 and VP7, the "Venrock 7 Entities" and the Venrock 7 Entities together with the VHCP Entities, the "Reporting Persons"). The Reporting Persons expressly disclaim status as a "group" for purposes of this Schedule 13G.
- ² Consists of 44,381 shares owned by VHCP I, 8,119 shares owned by VHCP Co-Invest I, 783,474 shares owned by VHCP II and 247,480 shares owned by VHCP Co-Invest II.
- ³ The shares included on rows 6, 8 and 9 do not include an aggregate of 908,453 shares of common stock held by VA7 and VP7. The VHCP Entities disclaim beneficial ownership over the shares held by the Venrock 7 Entities.
- ⁴ This percentage is calculated based upon 26,313,471 shares of the Issuer's common stock outstanding as of November 5, 2015, as set forth in the Issuer's quarterly report on Form 10-Q filed with the Securities and Exchange Commission on November 5, 2015.

CUSIP No. 75901B107 Page 3 of 18

1.	Name of Reporting Persons				
			stment Holdings, LLC		
2.		.ppr b)	ropriate Box if a Member of a Group (See Instructions) \mathbf{x}^1		
3.	SEC USE O	NL	Y		
4.	Citizenship	or F	Place of Organization		
	Delaware				
		5.	Sole Voting Power		
N	nber of		0		
	nares	6.	Shared Voting Power		
Bene	eficially		$1,083,454^2$		
Owned by Each		7.	Sole Dispositive Power		
Rep	oorting on With:		0		
1 6106	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	8.	Shared Dispositive Power		
			$1,083,454^2$		
9.	Aggregate A	lmo	ount Beneficially Owned by Each Reporting Person		
	1,083,454 ²				
10.	10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x ³				
11.	1. Percent of Class Represented by Amount in Row (9)				
	$4.1\%^{4}$				
12.		orti	ing Person (See Instructions)		
	00				

- This Schedule 13G is being filed by Venrock Healthcare Capital Partners, L.P. ("VHCP I"), VHCP Co-Investment Holdings, LLC ("VHCP Co-Invest I"), Venrock Healthcare Capital Partners II, L.P. ("VHCP II"), VHCP Co-Investment Holdings II, LLC ("VHCP Co-Invest II"), VHCP Management, LLC ("VHCP Management"), VHCP Management II, LLC ("VHCP Management II" and collectively with VHCP I, VHCP Co-Invest I, VHCP II, VHCP Co-Invest II and VHCP Management, the "VHCP Entities"), Venrock Associates VII, L.P. ("VA7"), Venrock Partners VII, L.P. ("VP7") and Venrock Management VII, LLC ("VM7" and together with VA7 and VP7, the "Venrock 7 Entities" and the Venrock 7 Entities together with the VHCP Entities, the "Reporting Persons"). The Reporting Persons expressly disclaim status as a "group" for purposes of this Schedule 13G.
- ² Consists of 44,381 shares owned by VHCP I, 8,119 shares owned by VHCP Co-Invest I, 783,474 shares owned by VHCP II and 247,480 shares owned by VHCP Co-Invest II.
- ³ The shares included on rows 6, 8 and 9 do not include an aggregate of 908,453 shares of common stock held by VA7 and VP7. The VHCP Entities disclaim beneficial ownership over the shares held by the Venrock 7 Entities.
- ⁴ This percentage is calculated based upon 26,313,471 shares of the Issuer's common stock outstanding as of November 5, 2015, as set forth in the Issuer's quarterly report on Form 10-Q filed with the Securities and Exchange Commission on November 5, 2015.

CUSIP No. 75901B107 Page 4 of 18

1.	Name of Reporting Persons				
			care Capital Partners II, L.P.		
2.			ropriate Box if a Member of a Group (See Instructions)		
	(a) □ (b)	\mathbf{x}^1		
3.	SEC USE C	NL	Y		
4.	Citizenship	or I	Place of Organization		
	Delaware				
	-	5.	Sole Voting Power		
			0		
_	iber of	6.	Shared Voting Power		
	ares ficially				
	ned by		1,083,454 ²		
	ach	7.	Sole Dispositive Power		
	orting n With:		0		
Perso	II WIUI:	8.	Shared Dispositive Power		
			1,083,4542		
9.	Aggregate A	Amo	ount Beneficially Owned by Each Reporting Person		
	1,083,454 ²				
10.	Check if the	Āξ	ggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x ³		
11.	1. Percent of Class Represented by Amount in Row (9)				
	$4.1\%^{4}$				
12		ort	ing Person (See Instructions)		
14.	Type of Kel	OI L	mg i eraon (acc inaunctiona)		
	PN				

- This Schedule 13G is being filed by Venrock Healthcare Capital Partners, L.P. ("VHCP I"), VHCP Co-Investment Holdings, LLC ("VHCP Co-Invest II"), Venrock Healthcare Capital Partners II, L.P. ("VHCP II"), VHCP Co-Investment Holdings II, LLC ("VHCP Co-Invest II"), VHCP Management, LLC ("VHCP Management"), VHCP Management II, LLC ("VHCP Management II" and collectively with VHCP I, VHCP Co-Invest I, VHCP II, VHCP Co-Invest II and VHCP Management, the "VHCP Entities"), Venrock Associates VII, L.P. ("VA7"), Venrock Partners VII, L.P. ("VP7") and Venrock Management VII, LLC ("VM7" and together with VA7 and VP7, the "Venrock 7 Entities" and the Venrock 7 Entities together with the VHCP Entities, the "Reporting Persons"). The Reporting Persons expressly disclaim status as a "group" for purposes of this Schedule 13G.
- Consists of 44,381 shares owned by VHCP I, 8,119 shares owned by VHCP Co-Invest I, 783,474 shares owned by VHCP II and 247,480 shares owned by VHCP Co-Invest II.
- ³ The shares included on rows 6, 8 and 9 do not include an aggregate of 908,453 shares of common stock held by VA7 and VP7. The VHCP Entities disclaim beneficial ownership over the shares held by the Venrock 7 Entities.
- ⁴ This percentage is calculated based upon 26,313,471 shares of the Issuer's common stock outstanding as of November 5, 2015, as set forth in the Issuer's quarterly report on Form 10-Q filed with the Securities and Exchange Commission on November 5, 2015.

CUSIP No. 75901B107 Page 5 of 18

	Name of Reporting Persons			
			stment Holdings II, LLC	
	(a) □ (b)		
3.	SEC USE O	NL	Y	
4.	Citizenship	or I	Place of Organization	
	Delaware			
	-	5.	Sole Voting Power	
			0	
	lber of ares	6.	Shared Voting Power	
Bene	ficially		$1,083,454^2$	
	ned by ach	7.	Sole Dispositive Power	
Rep	orting n With:		0	
Person	ii vvitii;	8.	Shared Dispositive Power	
			$1,083,454^2$	
9.	Aggregate A	mc	ount Beneficially Owned by Each Reporting Person	
	1,083,454 ²			
10.	Check if the	Αę	gregate Amount in Row (9) Excludes Certain Shares (See Instructions) x ³	
11.	Percent of Class Represented by Amount in Row (9)			
	and the control of th			
	$4.1\%^4$			
12.	Type of Rep	orti	ing Person (See Instructions)	
	00			

- This Schedule 13G is being filed by Venrock Healthcare Capital Partners, L.P. ("VHCP I"), VHCP Co-Investment Holdings, LLC ("VHCP Co-Invest II"), Venrock Healthcare Capital Partners II, L.P. ("VHCP II"), VHCP Co-Investment Holdings II, LLC ("VHCP Co-Invest II"), VHCP Management, LLC ("VHCP Management"), VHCP Management II, LLC ("VHCP Management II" and collectively with VHCP I, VHCP Co-Invest I, VHCP II, VHCP Co-Invest II and VHCP Management, the "VHCP Entities"), Venrock Associates VII, L.P. ("VA7"), Venrock Partners VII, L.P. ("VP7") and Venrock Management VII, LLC ("VM7" and together with VA7 and VP7, the "Venrock 7 Entities" and the Venrock 7 Entities together with the VHCP Entities, the "Reporting Persons"). The Reporting Persons expressly disclaim status as a "group" for purposes of this Schedule 13G.
- Consists of 44,381 shares owned by VHCP I, 8,119 shares owned by VHCP Co-Invest I, 783,474 shares owned by VHCP II and 247,480 shares owned by VHCP Co-Invest II.
- ³ The shares included on rows 6, 8 and 9 do not include an aggregate of 908,453 shares of common stock held by VA7 and VP7. The VHCP Entities disclaim beneficial ownership over the shares held by the Venrock 7 Entities.
- ⁴ This percentage is calculated based upon 26,313,471 shares of the Issuer's common stock outstanding as of November 5, 2015, as set forth in the Issuer's quarterly report on Form 10-Q filed with the Securities and Exchange Commission on November 5, 2015.

CUSIP No. 75901B107 Page 6 of 18

1.	Name of Reporting Persons			
	VHCP Man			
		priate Box if a Member of a Group (See Instructions)		
3.	SEC USE C			
4.	Citizenship	ace of Organization		
	Delaware			
		Sole Voting Power 0		
Number of Shares Beneficially Owned by Each Reporting Person With:		Shared Voting Power 1,083,454 ²		
		Sole Dispositive Power 0		
		Shared Dispositive Power 1,083,454 ²		
9.	Aggregate A	nt Beneficially Owned by Each Reporting Person		
	1,083,454 ²			
10.	Check if the	regate Amount in Row (9) Excludes Certain Shares (See Instructions) x ³		
11.	Percent of C	Represented by Amount in Row (9)		
	$4.1\%^{4}$			
12.	Type of Rep	g Person (See Instructions)		
	00			

- This Schedule 13G is being filed by Venrock Healthcare Capital Partners, L.P. ("VHCP I"), VHCP Co-Investment Holdings, LLC ("VHCP Co-Invest I"), Venrock Healthcare Capital Partners II, L.P. ("VHCP II"), VHCP Co-Investment Holdings II, LLC ("VHCP Co-Invest II"), VHCP Management, LLC ("VHCP Management"), VHCP Management II, LLC ("VHCP Management II" and collectively with VHCP I, VHCP Co-Invest I, VHCP II, VHCP Co-Invest II and VHCP Management, the "VHCP Entities"), Venrock Associates VII, L.P. ("VA7"), Venrock Partners VII, L.P. ("VP7") and Venrock Management VII, LLC ("VM7" and together with VA7 and VP7, the "Venrock 7 Entities" and the Venrock 7 Entities together with the VHCP Entities, the "Reporting Persons"). The Reporting Persons expressly disclaim status as a "group" for purposes of this Schedule 13G.
- Consists of 44,381 shares owned by VHCP I, 8,119 shares owned by VHCP Co-Invest I, 783,474 shares owned by VHCP II and 247,480 shares owned by VHCP Co-Invest II.
- ³ The shares included on rows 6, 8 and 9 do not include an aggregate of 908,453 shares of common stock held by VA7 and VP7. The VHCP Entities disclaim beneficial ownership over the shares held by the Venrock 7 Entities.
- ⁴ This percentage is calculated based upon 26,313,471 shares of the Issuer's common stock outstanding as of November 5, 2015, as set forth in the Issuer's quarterly report on Form 10-Q filed with the Securities and Exchange Commission on November 5, 2015.

CUSIP No. 75901B107 Page 7 of 18

1.	Name of Reporting Persons				
			ment II, LLC		
			ropriate Box if a Member of a Group (See Instructions)		
	(a) □	(b)			
3.	SEC USE	ONL	Y		
4.	Citizenship	or I	Place of Organization		
	Delaware				
	-	5.	Sole Voting Power		
			0		
-	ber of ares	6.	Shared Voting Power		
Bene	ficially		$1,083,454^2$		
	ned by ach	7.	Sole Dispositive Power		
Rep	orting		0		
Perso	n With:	8.	Shared Dispositive Power		
			$1,083,454^2$		
9.	Aggregate	Amo	ount Beneficially Owned by Each Reporting Person		
	1,083,454 ²				
10.	Check if th	ıe Aş	ggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x ³		
11	Dorcont of	Clas	s Represented by Amount in Row (9)		
11.	i erceiii Ol	CidS	s represented by Ambount III Row (3)		
	$4.1\%^{4}$				
12.	Type of Re	port	ing Person (See Instructions)		
	00				

- This Schedule 13G is being filed by Venrock Healthcare Capital Partners, L.P. ("VHCP I"), VHCP Co-Investment Holdings, LLC ("VHCP Co-Invest II"), Venrock Healthcare Capital Partners II, L.P. ("VHCP II"), VHCP Co-Investment Holdings II, LLC ("VHCP Co-Invest II"), VHCP Management, LLC ("VHCP Management"), VHCP Management II, LLC ("VHCP Management II" and collectively with VHCP I, VHCP Co-Invest I, VHCP II, VHCP Co-Invest II and VHCP Management, the "VHCP Entities"), Venrock Associates VII, L.P. ("VA7"), Venrock Partners VII, L.P. ("VP7") and Venrock Management VII, LLC ("VM7" and together with VA7 and VP7, the "Venrock 7 Entities" and the Venrock 7 Entities together with the VHCP Entities, the "Reporting Persons"). The Reporting Persons expressly disclaim status as a "group" for purposes of this Schedule 13G.
- Consists of 44,381 shares owned by VHCP I, 8,119 shares owned by VHCP Co-Invest I, 783,474 shares owned by VHCP II and 247,480 shares owned by VHCP Co-Invest II.
- ³ The shares included on rows 6, 8 and 9 do not include an aggregate of 908,453 shares of common stock held by VA7 and VP7. The VHCP Entities disclaim beneficial ownership over the shares held by the Venrock 7 Entities.
- ⁴ This percentage is calculated based upon 26,313,471 shares of the Issuer's common stock outstanding as of November 5, 2015, as set forth in the Issuer's quarterly report on Form 10-Q filed with the Securities and Exchange Commission on November 5, 2015.

CUSIP No. 75901B107 Page 8 of 18

1.	Name of Reporting Persons			
			iates VII, L.P.	
	(a) □ (b)		
3.	SEC USE O	NL	Y	
4.	Citizenship	or I	Place of Organization	
	Delaware			
	-	5.	Sole Voting Power	
			0	
Number of Shares		6.	Shared Voting Power	
	ficially		908,453 ²	
	ned by ach	7.	Sole Dispositive Power	
	orting n With:		0	
reiso	ii vvitii.	8.	Shared Dispositive Power	
			908,453 ²	
9.	Aggregate A	mc	ount Beneficially Owned by Each Reporting Person	
	908,453 ²			
10.	Check if the	Αę	gregate Amount in Row (9) Excludes Certain Shares (See Instructions) x ³	
11.	1. Percent of Class Represented by Amount in Row (9)			
	$3.5\%^{4}$			
		orti	ing Person (See Instructions)	
	PN			

- This Schedule 13G is being filed by Venrock Healthcare Capital Partners, L.P. ("VHCP I"), VHCP Co-Investment Holdings, LLC ("VHCP Co-Invest II"), Venrock Healthcare Capital Partners II, L.P. ("VHCP II"), VHCP Co-Investment Holdings II, LLC ("VHCP Co-Invest II"), VHCP Management, LLC ("VHCP Management"), VHCP Management II, LLC ("VHCP Management II" and collectively with VHCP I, VHCP Co-Invest I, VHCP II, VHCP Co-Invest II and VHCP Management, the "VHCP Entities"), Venrock Associates VII, L.P. ("VA7"), Venrock Partners VII, L.P. ("VP7") and Venrock Management VII, LLC ("VM7" and together with VA7 and VP7, the "Venrock 7 Entities" and the Venrock 7 Entities together with the VHCP Entities, the "Reporting Persons"). The Reporting Persons expressly disclaim status as a "group" for purposes of this Schedule 13G.
- ² Consists of 838,956 shares owned by VA7 and 69,497 shares owned by VP7.
- ³ The shares included on rows 6, 8 and 9 do not include an aggregate of 1,083,454 shares of common stock held by VHCP I, VHCP Co-Invest I, VHCP II and VHCP Co-Invest II. The Venrock 7 Entities disclaim beneficial ownership over the shares held by the VHCP Entities.
- ⁴ This percentage is calculated based upon 26,313,471 shares of the Issuer's common stock outstanding as of November 5, 2015, as set forth in the Issuer's quarterly report on Form 10-Q filed with the Securities and Exchange Commission on November 5, 2015.

CUSIP No. 75901B107 Page 9 of 18

1. Name of Reporting Persons Venrock Partners VII, L.P. 2. Check the Appropriate Box if a Member of a Group (See Instructions) (a) □ (b) x¹ 3. SEC USE ONLY 4. Citizenship or Place of Organization Delaware S. Sole Voting Power						
2. Check the Appropriate Box if a Member of a Group (See Instructions) (a) □ (b) x¹ 3. SEC USE ONLY 4. Citizenship or Place of Organization Delaware 5. Sole Voting Power □ 0 6. Shared Voting Power □ 908.453² 7. Sole Dispositive Power □ 0 8. Shared Dispositive Power □ 0 908.453² 908.453² 908.453² 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x³ 11. Percent of Class Represented by Amount in Row (9) 3.5%⁴ 12. Type of Reporting Person (See Instructions)	1.					
(a) (b) x ¹ 3. SEC USE ONLY 4. Citizenship or Place of Organization Delaware 5. Sole Voting Power 0 Shares Beneficially Owned by Each Reporting Person With: 7. Sole Dispositive Power 908,453 ² 9. Aggregate Amount Beneficially Owned by Each Reporting Person 908,453 ² 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x ³ 11. Percent of Class Represented by Amount in Row (9) 3.5% ⁴ 12. Type of Reporting Person (See Instructions)	2					
4. Citizenship or Place of Organization Delaware Solaware	۷.					
Delaware Number of Shares Shared Voting Power 0 0 0 0 0 0 0 0 0	3.	SEC USE O	NĽ	Y		
Number of Shares Beneficially Owned by Each Reporting Person With: 9. Aggregate Amount Beneficially Owned by Each Reporting Person 908,453² 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) 1. Percent of Class Represented by Amount in Row (9) 3.5%4 12. Type of Reporting Person (See Instructions)	4.	Citizenship	or P	Place of Organization		
Number of Shares Beneficially Owned by Each Reporting Person With: 908,453² 7. Sole Dispositive Power 0 Shared Dispositive Power 908,453² 9. Aggregate Amount Beneficially Owned by Each Reporting Person 908,453² 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x³ 11. Percent of Class Represented by Amount in Row (9) 3.5%4 12. Type of Reporting Person (See Instructions)		Delaware				
Number of Shares Beneficially Owned by Each Reporting Person With: 908,453² 7. Sole Dispositive Power 0 8. Shared Dispositive Power 908,453² 908,453² 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x³ 11. Percent of Class Represented by Amount in Row (9) 3.5%⁴ 12. Type of Reporting Person (See Instructions)	-		5.	Sole Voting Power		
Shares Beneficially Owned by Each Reporting Person With: 908,453² 7. Sole Dispositive Power 0 8. Shared Dispositive Power 908,453² 908,453² 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x³ 11. Percent of Class Represented by Amount in Row (9) 3.5%⁴ 12. Type of Reporting Person (See Instructions)	Num	abor of				
Beneficially Owned by Each Reporting Person With: 9. Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x3 10. Percent of Class Represented by Amount in Row (9) a. System of Reporting Person (See Instructions) x3 11. Percent of Class Represented by Amount in Row (9) a. System of Reporting Person (See Instructions) x3 12. Type of Reporting Person (See Instructions)	-		6.	Shared Voting Power		
Each Reporting Person With: 8. Shared Dispositive Power 908,453² 9. Aggregate Amount Beneficially Owned by Each Reporting Person 908,453² 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x³ 11. Percent of Class Represented by Amount in Row (9) 3.5%4 12. Type of Reporting Person (See Instructions)	Bene	ficially				
Reporting Person With: 8. Shared Dispositive Power 908,453² 9. Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x³ 11. Percent of Class Represented by Amount in Row (9) 3.5%4 12. Type of Reporting Person (See Instructions)			7.	Sole Dispositive Power		
9. Aggregate Amount Beneficially Owned by Each Reporting Person 908,453² 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x³ 11. Percent of Class Represented by Amount in Row (9) 3.5%4 12. Type of Reporting Person (See Instructions)	Rep	orting		•		
 9. Aggregate Amount Beneficially Owned by Each Reporting Person 908,453² 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x³ 11. Percent of Class Represented by Amount in Row (9) 3.5%⁴ 12. Type of Reporting Person (See Instructions) 	1 0130	11 ***1011.	8.	Shared Dispositive Power		
908,453 ² 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x ³ 11. Percent of Class Represented by Amount in Row (9) 3.5% ⁴ 12. Type of Reporting Person (See Instructions)						
 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x³ 11. Percent of Class Represented by Amount in Row (9) 3.5%4 12. Type of Reporting Person (See Instructions) 	9.	Aggregate A	mo	ount Beneficially Owned by Each Reporting Person		
 10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x³ 11. Percent of Class Represented by Amount in Row (9) 3.5%4 12. Type of Reporting Person (See Instructions) 		008 4532				
 11. Percent of Class Represented by Amount in Row (9) 3.5%⁴ 12. Type of Reporting Person (See Instructions) 	10		Ασ	ggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x ³		
3.5% ⁴ 12. Type of Reporting Person (See Instructions)	10.		- 5	gregate random in red. (5) Excitates dettain onates (see instructions) A		
12. Type of Reporting Person (See Instructions)	11.	Percent of C	lass	s Represented by Amount in Row (9)		
		$3.5\%^{4}$				
	12.		orti	ing Person (See Instructions)		
DN						
FIV						

- This Schedule 13G is being filed by Venrock Healthcare Capital Partners, L.P. ("VHCP I"), VHCP Co-Investment Holdings, LLC ("VHCP Co-Invest I"), Venrock Healthcare Capital Partners II, L.P. ("VHCP II"), VHCP Co-Investment Holdings II, LLC ("VHCP Co-Invest II"), VHCP Management, LLC ("VHCP Management"), VHCP Management II, LLC ("VHCP Management II" and collectively with VHCP I, VHCP Co-Invest I, VHCP II, VHCP Co-Invest II and VHCP Management, the "VHCP Entities"), Venrock Associates VII, L.P. ("VA7"), Venrock Partners VII, L.P. ("VP7") and Venrock Management VII, LLC ("VM7" and together with VA7 and VP7, the "Venrock 7 Entities" and the Venrock 7 Entities together with the VHCP Entities, the "Reporting Persons"). The Reporting Persons expressly disclaim status as a "group" for purposes of this Schedule 13G.
- ² Consists of 838,956 shares owned by VA7 and 69,497 shares owned by VP7.
- ³ The shares included on rows 6, 8 and 9 do not include an aggregate of 1,083,454 shares of common stock held by VHCP I, VHCP Co-Invest I, VHCP II and VHCP Co-Invest II. The Venrock 7 Entities disclaim beneficial ownership over the shares held by the VHCP Entities.
- ⁴ This percentage is calculated based upon 26,313,471 shares of the Issuer's common stock outstanding as of November 5, 2015, as set forth in the Issuer's quarterly report on Form 10-Q filed with the Securities and Exchange Commission on November 5, 2015.

CUSIP No. 75901B107 Page 10 of 18

	Name of Reporting Persons				
		_	gement VII, LLC		
			ropriate Box if a Member of a Group (See Instructions)		
	(a) □ (b)	$\mathbf{X}^{\mathbf{r}}$		
3.	SEC USE O	NL	Y		
4.	Citizenship	or F	Place of Organization		
	_ · · · · ·				
	Delaware				
		5.	Sole Voting Power		
Num	ber of	6.	0 Shared Voting Power		
_	ares	ο.	Shared voting Power		
	ficially		908,453 ²		
	ied by ach	7.	Sole Dispositive Power		
	orting				
	n With:	_	0		
		8.	Shared Dispositive Power		
			908,453 ²		
9.	Aggregate A	mc	ount Beneficially Owned by Each Reporting Person		
	908,453 ²				
10.	10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) x^3				
11.	1. Percent of Class Represented by Amount in Row (9)				
	3.5%4				
12.	Type of Rep	orti	ing Person (See Instructions)		
	00				

- This Schedule 13G is being filed by Venrock Healthcare Capital Partners, L.P. ("VHCP I"), VHCP Co-Investment Holdings, LLC ("VHCP Co-Invest I"), Venrock Healthcare Capital Partners II, L.P. ("VHCP II"), VHCP Co-Investment Holdings II, LLC ("VHCP Co-Invest II"), VHCP Management, LLC ("VHCP Management"), VHCP Management II, LLC ("VHCP Management II" and collectively with VHCP I, VHCP Co-Invest I, VHCP II, VHCP Co-Invest II and VHCP Management, the "VHCP Entities"), Venrock Associates VII, L.P. ("VA7"), Venrock Partners VII, L.P. ("VP7") and Venrock Management VII, LLC ("VM7" and together with VA7 and VP7, the "Venrock 7 Entities" and the Venrock 7 Entities together with the VHCP Entities, the "Reporting Persons"). The Reporting Persons expressly disclaim status as a "group" for purposes of this Schedule 13G.
- ² Consists of 838,956 shares owned by VA7 and 69,497 shares owned by VP7.
- ³ The shares included on rows 6, 8 and 9 do not include an aggregate of 1,083,454 shares of common stock held by VHCP I, VHCP Co-Invest I, VHCP II and VHCP Co-Invest II. The Venrock 7 Entities disclaim beneficial ownership over the shares held by the VHCP Entities.
- ⁴ This percentage is calculated based upon 26,313,471 shares of the Issuer's common stock outstanding as of November 5, 2015, as set forth in the Issuer's quarterly report on Form 10-Q filed with the Securities and Exchange Commission on November 5, 2015.

CUSIP No. 75901B107 Page 11 of 18

Introductory Note: This Schedule 13G is filed on behalf of Venrock Healthcare Capital Partners, L.P., a limited partnership organized under the laws of the State of Delaware ("VHCP I"), VHCP Co-Investment Holdings, LLC, a limited liability company organized under the laws of the State of Delaware ("VHCP Co-Invest I"), Venrock Healthcare Capital Partners II, L.P., a limited partnership organized under the laws of the State of Delaware ("VHCP II"), VHCP Co-Investment Holdings II, LLC, a limited liability company organized under the laws of the State of Delaware ("VHCP Co-Invest II"), VHCP Management, LLC, a limited liability company organized under the laws of the State of Delaware ("VHCP Management"), VHCP Management II, LLC, a limited liability company organized under the laws of the State of Delaware ("VHCP Management II" and collectively with VHCP I, VHCP II, VHCP Co-Invest I, VHCP Co-Invest II and VHCP Management, the "VHCP Entities"), Venrock Associates VII, L.P. ("VA7"), Venrock Partners VII, L.P. ("VP7") and Venrock Management VII, LLC ("VM7") and collectively with VA7 and VP7, the "Venrock 7 Entities") in respect of shares of common stock of REGENXBIO Inc.

Item 1.

- (a) Name of Issuer REGENXBIO Inc.
- (b) Address of Issuer's Principal Executive Offices 9712 Medical Center Drive, Suite 100 Rockville, MD 20850

Item 2.

(a) Name of Person Filing

Venrock Healthcare Capital Partners, L.P.
VHCP Co-Investment Holdings, LLC
Venrock Healthcare Capital Partners II, L.P.
VHCP Co-Investment Holdings II, LLC
VHCP Management, LLC
VHCP Management II, LLC
Venrock Associates VII, L.P.
Venrock Partners VII, L.P.
Venrock Management VII, LLC

(b) Address of Principal Business Office or, if none, Residence

New York Office: 530 Fifth Avenue 22nd Floor New York, NY 10036 Palo Alto Office: 3340 Hillview Avenue Palo Alto, CA 94304 Boston Office: 470 Atlantic Avenue 4th Floor Boston, MA 02210 **CUSIP No. 75901B107** Page 12 of 18

(c) Citizenship

Each of the Venrock 7 Entities and VHCP Entities was organized in Delaware.

(d) Title of Class of Securities

Common Stock, \$0.0001 par value

(e) CUSIP Number 75901B107

Item 3. If this statement is filed pursuant to §§240.13d-1(b), or 240.13d-2(b) or (c), check whether the person filing is a:

Not applicable

Item 4. Ownership

(a) Amount Beneficially Owned as of December 31, 2015:

Venrock Healthcare Capital Partners, L.P.	1,083,454 (1)
VHCP Co-Investment Holdings, LLC	1,083,454 (1)
Venrock Healthcare Capital Partners II, L.P.	1,083,454 (1)
VHCP Co-Investment Holdings II, LLC	1,083,454 (1)
VHCP Management, LLC	1,083,454 (1)
VHCP Management II, LLC	1,083,454 (1)
Venrock Associates VII, L.P.	908,453 (2)
Venrock Partners VII, L.P.	908,453 (2)
Venrock Management VII, LLC	908,453 (2)

(b) Percent of Class as of December 31, 2015:

Venrock Healthcare Capital Partners, L.P.	4.1% (3)
VHCP Co-Investment Holdings, LLC	4.1% (3)
Venrock Healthcare Capital Partners II, L.P.	4.1% (3)
VHCP Co-Investment Holdings II, LLC	4.1% (3)
VHCP Management, LLC	4.1% (3)
VHCP Management II, LLC	4.1% (3)
Venrock Associates VII, L.P.	3.5% (3)
Venrock Partners VII, L.P.	3.5% (3)
Venrock Management VII, LLC	3.5% (3)

(c) Number of shares as to which the person has, as of December 31, 2015:

CUSIP No. 75901B107 Page 13 of 18

(i) Sole power to vote or to direct the vote

Venrock Healthcare Capital Partners, L.P.	0
VHCP Co-Investment Holdings, LLC	0
Venrock Healthcare Capital Partners II, L.P.	0
VHCP Co-Investment Holdings II, LLC	0
VHCP Management, LLC	0
VHCP Management II, LLC	0
Venrock Associates VII, L.P.	0
Venrock Partners VII, L.P.	0
Venrock Management VII, LLC	0

(ii) Shared power to vote or to direct the vote $\$

Venrock Healthcare Capital Partners, L.P.	1,083,454 (1)
VHCP Co-Investment Holdings, LLC	1,083,454 (1)
Venrock Healthcare Capital Partners II, L.P.	1,083,454 (1)
VHCP Co-Investment Holdings II, LLC	1,083,454 (1)
VHCP Management, LLC	1,083,454 (1)
VHCP Management II, LLC	1,083,454 (1)
Venrock Associates VII, L.P.	908,453 (2)
Venrock Partners VII, L.P.	908,453 (2)
Venrock Management VII, LLC	908,453 (2)

(V) Sole power to dispose or to direct the disposition of

Venrock Healthcare Capital Partners, L.P.	0
VHCP Co-Investment Holdings, LLC	0
Venrock Healthcare Capital Partners II, L.P.	0
VHCP Co-Investment Holdings II, LLC	0
VHCP Management, LLC	0
VHCP Management II, LLC	0
Venrock Associates VII, L.P.	0
Venrock Partners VII, L.P.	0
Venrock Management VII, LLC	0

(iv) Shared power to dispose or to direct the disposition of

Venrock Healthcare Capital Partners, L.P.	1,083,454 (1)
VHCP Co-Investment Holdings, LLC	1,083,454 (1)
Venrock Healthcare Capital Partners II, L.P.	1,083,454 (1)
VHCP Co-Investment Holdings II, LLC	1,083,454 (1)
VHCP Management, LLC	1,083,454 (1)
VHCP Management II, LLC	1,083,454 (1)
Venrock Associates VII, L.P.	908,453 (2)
Venrock Partners VII, L.P.	908,453 (2)
Venrock Management VII, LLC	908,453 (2)

CUSIP No. 75901B107 Page 14 of 18

(1) These shares are owned directly as follows: 44,381 shares are owned by VHCP I, 8,119 shares are owned by VHCP Co-Invest I, 783,474 shares are owned by VHCP II and 247,480 shares are owned by VHCP Co-Invest II.

- (2) These shares are owned directly as follows: 838,956 shares are owned by VA7 and 69,497 shares are owned by VP7.
- (3) This percentage is calculated based upon 26,313,471 shares of the Issuer's common stock outstanding as of November 5, 2015, as set forth in the Issuer's quarterly report on Form 10-Q filed with the Securities and Exchange Commission on November 5, 2015.

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

If this statement is being filed to report the fact that as of the date hereof the reporting person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following \Box .

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

Not Applicable

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 a Group

Not Applicable

Item 10. Certification

Not Applicable

CUSIP No. 75901B107 Page 15 of 18

SIGNATURE

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: February 16, 2016

Venrock Healthcare Capital Partners, L.P.

By: VHCP Management, LLC

Its: General Partner

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

VHCP Co-Investment Holdings, LLC

By: VHCP Management, LLC

Its: Manager

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

VHCP Management, LLC

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

Venrock Healthcare Capital Partners II, L.P.

By: VHCP Management II, LLC

Its: General Partner

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

VHCP Co-Investment Holdings II, LLC

By: VHCP Management II, LLC

Its: Manager

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

VHCP Management II, LLC

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

Venrock Associates VII, L.P.

By: Venrock Management VII, LLC

Its: General Partner

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

Venrock Partners VII, L.P.

By: Venrock Partners Management VII, LLC

Its: General Partner

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

Venrock Management VII, LLC

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

EXHIBITS

A: Joint Filing Agreement

CUSIP No. 75901B107 Page 17 of 18

EXHIBIT A

JOINT FILING AGREEMENT

In accordance with Rule 13d-1(k) under the Securities Exchange Act of 1934, as amended, the undersigned agree to the joint filing on behalf of each of them of a statement on Schedule 13G (including amendments thereto) with respect to the Common Stock of REGENXBIO Inc. and further agree that this agreement be included as an exhibit to such filing. Each party to the agreement expressly authorizes each other party to file on its behalf any and all amendments to such statement. Each party to this agreement agrees that this joint filing agreement may be signed in counterparts.

In evidence whereof, the undersigned have caused this Agreement to be executed on their behalf this 16th day of February, 2016.

Venrock Healthcare Capital Partners, L.P.

By: VHCP Management, LLC

Its: General Partner

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

VHCP Co-Investment Holdings, LLC

By: VHCP Management, LLC

Its: Manager

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

VHCP Management, LLC

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

Venrock Healthcare Capital Partners II, L.P.

By: VHCP Management II, LLC

Its: General Partner

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

VHCP Co-Investment Holdings II, LLC

By: VHCP Management II, LLC

Its: Manager

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

VHCP Management II, LLC

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory **CUSIP No. 75901B107** Page 18 of 18

Venrock Associates VII, L.P.

By: Venrock Management VII, LLC

Its: General Partner

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

Venrock Partners VII, L.P.

By: Venrock Partners Management VII, LLC

Its: General Partner

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory

Venrock Management VII, LLC

By: /s/ David L. Stepp

David L. Stepp Authorized Signatory