
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

SCHEDULE 13D

UNDER THE SECURITIES EXCHANGE ACT OF 1934
(Amendment No. 3)*

AXCELLA HEALTH INC.
(Name of Issuer)

Common Stock, \$0.001 par value per share
(Title of Class of Securities)

05454B105
(CUSIP Number)

Noubar B. Afeyan, Ph.D.
Flagship Pioneering
55 Cambridge Parkway, Suite 800E
Cambridge, MA 02142
(617) 868-1888
(Name, Address and Telephone Number of Person
Authorized to Receive Notices and Communications)

September 20, 2022
(Date of Event Which Requires Filing of Statement on Schedule 13D)

If the filing person has previously filed a statement on Schedule 13G to report the acquisition that is the subject of this Schedule 13D, and is filing this schedule because of §§240.13d-1(e), 240.13d-1(f) or 240.13d-1(g), checking the following box.

* 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 disclosures provided in a prior cover page.

The information required on 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).

(1)	Name of Reporting Persons: Flagship VentureLabs IV, LLC	
(2)	Check the Appropriate Box if a Member of a Group (See Instructions): (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
(3)	SEC Use Only:	
(4)	Source of Funds (See Instructions): WC	
(5)	Check Box if Disclosure of Legal Proceedings is Required Pursuant to Items 2(d) or 2(e): <input type="checkbox"/>	
(6)	Citizenship or Place of Organization: Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	(7)	Sole Voting Power 0
	(8)	Shared Voting Power 2,035,830
	(9)	Sole Dispositive Power 0
	(10)	Shared Dispositive Power 2,035,830
(11)	Aggregate Amount Beneficially Owned by Each Reporting Person: 2,035,830	
(12)	Check Box if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions): <input type="checkbox"/>	
(13)	Percent of Class Represented by Amount in Row (11): 3.9%	
(14)	Type of Reporting Person (See Instructions): OO	

(1)	Name of Reporting Persons: Flagship Ventures Fund IV, L.P.	
(2)	Check the Appropriate Box if a Member of a Group (See Instructions): (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
(3)	SEC Use Only:	
(4)	Source of Funds (See Instructions): WC	
(5)	Check Box if Disclosure of Legal Proceedings is Required Pursuant to Items 2(d) or 2(e): <input type="checkbox"/>	
(6)	Citizenship or Place of Organization: Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	(7)	Sole Voting Power 0
	(8)	Shared Voting Power 10,636,233
	(9)	Sole Dispositive Power 0
	(10)	Shared Dispositive Power 10,636,233
(11)	Aggregate Amount Beneficially Owned by Each Reporting Person: 10,636,233	
(12)	Check Box if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions): <input type="checkbox"/>	
(13)	Percent of Class Represented by Amount in Row (11): 20.2%	
(14)	Type of Reporting Person (See Instructions): PN	

(1)	Name of Reporting Persons: Flagship Ventures Fund IV-Rx, L.P.	
(2)	Check the Appropriate Box if a Member of a Group (See Instructions): (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
(3)	SEC Use Only:	
(4)	Source of Funds (See Instructions): WC	
(5)	Check Box if Disclosure of Legal Proceedings is Required Pursuant to Items 2(d) or 2(e): <input type="checkbox"/>	
(6)	Citizenship or Place of Organization: Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	(7)	Sole Voting Power 0
	(8)	Shared Voting Power 2,004,657
	(9)	Sole Dispositive Power 0
	(10)	Shared Dispositive Power 2,004,657
(11)	Aggregate Amount Beneficially Owned by Each Reporting Person: 2,004,657	
(12)	Check Box if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions): <input type="checkbox"/>	
(13)	Percent of Class Represented by Amount in Row (11): 3.8%	
(14)	Type of Reporting Person (See Instructions): PN	

(1)	Name of Reporting Persons: Flagship Ventures Fund IV General Partner LLC	
(2)	Check the Appropriate Box if a Member of a Group (See Instructions): (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
(3)	SEC Use Only:	
(4)	Source of Funds (See Instructions): AF	
(5)	Check Box if Disclosure of Legal Proceedings is Required Pursuant to Items 2(d) or 2(e): <input type="checkbox"/>	
(6)	Citizenship or Place of Organization: Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	(7)	Sole Voting Power 0
	(8)	Shared Voting Power 12,640,890
	(9)	Sole Dispositive Power 0
	(10)	Shared Dispositive Power 12,640,890
(11)	Aggregate Amount Beneficially Owned by Each Reporting Person: 12,640,890	
(12)	Check Box if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions): <input type="checkbox"/>	
(13)	Percent of Class Represented by Amount in Row (11): 24.0%	
(14)	Type of Reporting Person (See Instructions): OO	

(1)	Name of Reporting Persons: Flagship Ventures Fund 2007, L.P.	
(2)	Check the Appropriate Box if a Member of a Group (See Instructions): (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
(3)	SEC Use Only:	
(4)	Source of Funds (See Instructions): WC	
(5)	Check Box if Disclosure of Legal Proceedings is Required Pursuant to Items 2(d) or 2(e): <input type="checkbox"/>	
(6)	Citizenship or Place of Organization: Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	(7)	Sole Voting Power 0
	(8)	Shared Voting Power 1,761,029
	(9)	Sole Dispositive Power 0
	(10)	Shared Dispositive Power 1,761,029
(11)	Aggregate Amount Beneficially Owned by Each Reporting Person: 1,761,029	
(12)	Check Box if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions): <input type="checkbox"/>	
(13)	Percent of Class Represented by Amount in Row (11): 3.3%	
(14)	Type of Reporting Person (See Instructions): PN	

(1)	Name of Reporting Persons: Flagship Ventures 2007 General Partner LLC	
(2)	Check the Appropriate Box if a Member of a Group (See Instructions): (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
(3)	SEC Use Only:	
(4)	Source of Funds (See Instructions): AF	
(5)	Check Box if Disclosure of Legal Proceedings is Required Pursuant to Items 2(d) or 2(e): <input type="checkbox"/>	
(6)	Citizenship or Place of Organization: Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	(7)	Sole Voting Power 0
	(8)	Shared Voting Power 1,761,029
	(9)	Sole Dispositive Power 0
	(10)	Shared Dispositive Power 1,761,029
(11)	Aggregate Amount Beneficially Owned by Each Reporting Person: 1,761,029	
(12)	Check Box if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions): <input type="checkbox"/>	
(13)	Percent of Class Represented by Amount in Row (11): 3.3%	
(14)	Type of Reporting Person (See Instructions): OO	

(1)	Name of Reporting Persons: Flagship Ventures Opportunities Fund I, L.P.	
(2)	Check the Appropriate Box if a Member of a Group (See Instructions): (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
(3)	SEC Use Only:	
(4)	Source of Funds (See Instructions): WC	
(5)	Check Box if Disclosure of Legal Proceedings is Required Pursuant to Items 2(d) or 2(e): <input type="checkbox"/>	
(6)	Citizenship or Place of Organization: Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	(7)	Sole Voting Power 0
	(8)	Shared Voting Power 4,465,866
	(9)	Sole Dispositive Power 0
	(10)	Shared Dispositive Power 4,465,866
(11)	Aggregate Amount Beneficially Owned by Each Reporting Person: 4,465,866	
(12)	Check Box if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions): <input type="checkbox"/>	
(13)	Percent of Class Represented by Amount in Row (11): 8.5%	
(14)	Type of Reporting Person (See Instructions): PN	

(1)	Name of Reporting Persons: Flagship Ventures Opportunities Fund I General Partner LLC	
(2)	Check the Appropriate Box if a Member of a Group (See Instructions): (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
(3)	SEC Use Only:	
(4)	Source of Funds (See Instructions): AF	
(5)	Check Box if Disclosure of Legal Proceedings is Required Pursuant to Items 2(d) or 2(e): <input type="checkbox"/>	
(6)	Citizenship or Place of Organization: Delaware	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	(7)	Sole Voting Power 0
	(8)	Shared Voting Power 4,465,866
	(9)	Sole Dispositive Power 0
	(10)	Shared Dispositive Power 4,465,866
(11)	Aggregate Amount Beneficially Owned by Each Reporting Person: 4,465,866	
(12)	Check Box if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions): <input type="checkbox"/>	
(13)	Percent of Class Represented by Amount in Row (11): 8.5%	
(14)	Type of Reporting Person (See Instructions): OO	

(1)	Name of Reporting Persons: Noubar B. Afeyan, Ph.D.	
(2)	Check the Appropriate Box if a Member of a Group (See Instructions): (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>	
(3)	SEC Use Only:	
(4)	Source of Funds (See Instructions): AF	
(5)	Check Box if Disclosure of Legal Proceedings is Required Pursuant to Items 2(d) or 2(e): <input type="checkbox"/>	
(6)	Citizenship or Place of Organization: United States of America	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH:	(7)	Sole Voting Power 0
	(8)	Shared Voting Power 18,867,785
	(9)	Sole Dispositive Power 0
	(10)	Shared Dispositive Power 18,867,785
(11)	Aggregate Amount Beneficially Owned by Each Reporting Person: 18,867,785	
(12)	Check Box if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions): <input type="checkbox"/>	
(13)	Percent of Class Represented by Amount in Row (11): 35.8%	
(14)	Type of Reporting Person (See Instructions): IN	

ITEM 1. SECURITY AND ISSUER

This Amendment No. 3 (this "Amendment") amends and supplements the Schedule 13D (the "Schedule 13D") filed by the Reporting Persons (as defined below) on May 23, 2019, as amended, with respect to the common stock, \$0.001 par value per share ("Common Stock"), of Axcella Health Inc. (the "Issuer" or the "Company"). Except as specifically provided herein, this Amendment does not modify any of the information previously reported in the Schedule 13D.

ITEM 4. PURPOSE OF TRANSACTION

Item 4 is hereby amended to include the following:

Securities Purchase Agreement

On September 20, 2022, the Company entered into a Securities Purchase Agreement (the "Purchase Agreement") with Flagship Ventures Fund IV, L.P. ("Flagship Fund IV") and Flagship Ventures Opportunities Fund I, L.P. ("Flagship Opportunities I," each a "Purchaser" and together, the "Purchasers"), pursuant to which the Company agreed to sell, and the Purchasers agreed to purchase, unsecured convertible promissory notes in aggregate principal amount of up to \$12 million (the "Notes") in a private placement (the "Private Placement") with the initial closing occurring on September 20, 2022 (the "Initial Closing" and such date, the "Initial Closing Date"). At the Initial Closing, Flagship Fund IV and Flagship Opportunities I purchased \$4,500,000 and \$1,500,000 in Notes, respectively. The Company may conduct any number of additional closings (each, including the Initial Closing, a "Closing") so long as the final Closing occurs on or before the six month anniversary of the Initial Closing Date.

The Notes mature one year from the date of issuance and bear interest at the rate of 8% per annum payable upon the earlier of (i) voluntary conversion of the Notes in accordance with the terms thereof and (ii) the maturity date. All principal and accrued interest under the Notes (the "Outstanding Balance") will automatically convert at the Company's next equity financing (the "Subsequent Financing"), without any action on the part of the Purchasers, into such securities of the Company as are issued in the Subsequent Financing at a conversion price equal to lowest price per share of Common Stock paid by investors in such Subsequent Financing (provided, however, if such Subsequent Financing is not a public offering and the number of securities to be issued in the Subsequent Financing shall exceed 20% of the voting power of the Company outstanding before the issuance of stock or securities convertible into or exercisable for Common Stock, and stockholder approval has not been obtained with respect to Nasdaq Stock Market Rule 5635(d), then the Conversion Price shall be at least the lower of: (i) the closing price of the Common Stock; or (ii) the average closing price of the Common Stock for the five Trading Days immediately preceding the signing of the definitive documentation or pricing of the Subsequent Financing.) Additionally, in the event that the Notes do not automatically convert prior to the six month anniversary of the Initial Closing, then at any time after such six month anniversary, Purchasers holding a majority of the outstanding balance of the Notes may elect to cause the conversion of all of the Notes into such number of shares of Common Stock equal to (i) the Outstanding Balance plus all accrued and unpaid interest thereon divided by (ii) the lower of (a) the closing price of the Common Stock on such conversion date; or (b) the average closing price of the Common Stock for the five Trading Days immediately preceding such conversion date.

The Purchase Agreement includes customary covenants, representations and warranty provisions for agreements of its kind.

The foregoing summaries of the Purchase Agreement and Notes are qualified in their entirety by the full text of such agreements, the forms of which are filed herewith as Exhibit 99.2 and Exhibit 99.3, respectively, and are incorporated by reference into this Item 4.

ITEM 5. INTEREST IN SECURITIES OF THE ISSUER

Item 5(a)-(c) is hereby amended and restated as follows:

(a)-(b) The information set forth in rows 7 through 13 of the cover pages to this Schedule 13D is incorporated by reference. The percentage set forth in row 13 is based on 52,643,309 outstanding shares of Common Stock as of August 9, 2022, as in the Issuer's Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on August 12, 2022.

Flagship VentureLabs IV, LLC (“VentureLabs IV”), Flagship Fund IV and Flagship Ventures Fund IV-Rx, L.P. (“Flagship Fund IV-Rx” and together with VentureLabs IV and Flagship Fund IV, the “Flagship IV Funds”) directly hold 2,035,830 shares, 8,600,403 shares and 2,004,657 shares of Common Stock, respectively. Flagship Fund IV, as the manager of VentureLabs IV, may be deemed to beneficially own the shares directly held by VentureLabs IV. Flagship Ventures Fund IV General Partner LLC (“Flagship Fund IV GP”), as the general partner of the Flagship Fund IV Funds, may be deemed to beneficially own the shares directly held by the Flagship Fund IV Funds.

Flagship Ventures Fund 2007, L.P. (“Flagship Fund 2007”) directly holds 1,761,029 shares of Common Stock. Flagship Ventures 2007 General Partner LLC (“Flagship 2007 GP”), as the general partner of Flagship Fund 2007, may be deemed to beneficially own the shares directly held by Flagship Fund 2007.

Flagship Opportunities I directly holds 4,465,866 shares of Common Stock. Flagship Ventures Opportunities Fund I General Partner LLC (“Flagship Opportunities GP”), as the general partner of Flagship Opportunities I, may be deemed to beneficially own the shares directly held by Flagship Opportunities I.

Noubar B. Afeyan, Ph.D., as the sole manager of Flagship Fund IV GP, Flagship Fund 2007 GP and Flagship Opportunities GP, may be deemed to beneficially own the shares directly held by the Flagship IV Funds, Flagship Fund 2007 and Flagship Opportunities I.

(c) None of the Reporting Persons have effected transactions in the Common Stock of the Issuer during the past 60 days.

ITEM 6. CONTRACTS, ARRANGEMENTS, UNDERSTANDINGS OR RELATIONSHIPS WITH RESPECT TO SECURITIES OF THE ISSUER

The information set forth in Item 4 hereof is incorporated by reference in its entirety into this Item 6.

ITEM 7. MATERIAL TO BE FILED AS EXHIBITS

- | | |
|--------------|---|
| Exhibit 99.1 | Joint Filing Agreement (filed herewith). |
| Exhibit 99.2 | Purchase Agreement (incorporated by reference to Exhibit 10.1 to the Issuer’s Current Report on Form 8-K filed with the Securities and Exchange Commission on September 23, 2022). |
| Exhibit 99.3 | Form of Convertible Promissory Note (incorporated by reference to Exhibit 10.2 to the Issuer’s Current Report on Form 8-K filed with the Securities and Exchange Commission on September 23, 2022). |

SIGNATURE

After reasonable inquiry and to the best of its knowledge and belief, the undersigned certifies that the information set forth in this Statement is true, complete and correct.

Dated: September 23, 2022

FLAGSHIP VENTURELABS IV, LLC

By: Flagship Ventures Fund IV, L.P.

By: Flagship Ventures Fund IV General Partner LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES FUND IV, L.P.

By: Flagship Ventures Fund IV General Partner LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES FUND IV-Rx, L.P.

By: Flagship Ventures Fund IV General Partner LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES FUND IV GENERAL PARTNER
LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES FUND 2007, L.P.

By: Flagship Ventures 2007 General Partner LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES 2007 GENERAL PARTNER LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES OPPORTUNITIES FUND I, L.P.

By: Flagship Ventures Opportunities Fund I General
Partner LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES OPPORTUNITIES FUND I
GENERAL PARTNER LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

/s/ Noubar B. Afeyan, Ph.D.

NOUBAR B. AFEYAN, PH.D.

CUSIP No. 05454B105

JOINT FILING AGREEMENT

The undersigned acknowledge and agree that the foregoing statement on Schedule 13D is filed on behalf of each of the undersigned and that all subsequent amendments to this statement on Schedule 13D may be filed on behalf of each of the undersigned without the necessity of filing additional joint filing agreements. The undersigned acknowledge that each shall be responsible for the timely filing of such amendments, and for the completeness and accuracy of the information concerning him or it contained herein or therein, but shall not be responsible for the completeness and accuracy of the information concerning the others, except to the extent that he or it knows or has reason to believe that such information is inaccurate.

Dated: September 23, 2022

FLAGSHIP VENTURELABS IV, LLC

By: Flagship Ventures Fund IV, L.P.

By: Flagship Ventures Fund IV General Partner LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES FUND IV, L.P.

By: Flagship Ventures Fund IV General Partner LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES FUND IV-Rx, L.P.

By: Flagship Ventures Fund IV General Partner LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES FUND IV GENERAL PARTNER
LLCBy: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES FUND 2007, L.P.

By: Flagship Ventures 2007 General Partner LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES 2007 GENERAL PARTNER LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

CUSIP No. 05454B105

FLAGSHIP VENTURES OPPORTUNITIES FUND I, L.P.

By: Flagship Ventures Opportunities Fund I General
Partner LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

FLAGSHIP VENTURES OPPORTUNITIES FUND I
GENERAL PARTNER LLC

By: /s/ Noubar B. Afeyan, Ph.D.

Name: Noubar B. Afeyan, Ph.D.

Title: Manager

/s/ Noubar B. Afeyan, Ph.D.

NOUBAR B. AFEYAN, PH.D.