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

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**SCHEDULE 13D  
Under the Securities Exchange Act of 1934  
(Amendment No.        )\***

**SEMA4 HOLDINGS CORP.**

(Name of Issuer)

**Class A Common Stock**

(Title of Class of Securities)

**81663L101**

(CUSIP Number)

**Mount Sinai Health System, Inc.**

**150 East 42nd Street**

**Suite 2-B.17**

**New York, NY 10017**

**212.659.8105**

(Name, Address and Telephone Number of Person  
Authorized to Receive Notices and Communications)

**July 22, 2021**

(Date of Event which Requires Filing of this Statement)

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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), check the following box.

**Note:** Schedules filed in paper format shall include a signed original and five copies of the schedule, including all exhibits.

See §240.13d-7 for other parties to whom copies are to be sent.

\* 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, as amended (the "Exchange Act") or otherwise subject to the liabilities of that section of the Exchange Act but shall be subject to all other provisions of the Exchange Act (however, see the Notes).

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1	NAMES OF REPORTING PERSONS ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (SEE INSTRUCTIONS)  (a) <input type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC USE ONLY	
4	SOURCE OF FUNDS  OO	
5	CHECK IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEMS 2(d) OR 2(e)  <input type="checkbox"/>	
6	CITIZENSHIP OR PLACE OF ORGANIZATION  New York	
Number of Shares Beneficially Owned By Each Reporting Person With	7	SOLE VOTING POWER  88,355,473
	8	SHARED VOTING POWER  0
	9	SOLE DISPOSITIVE POWER  88,355,473
	10	SHARED DISPOSITIVE POWER  0
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  88,355,473	
12	CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES (SEE INSTRUCTIONS)  <input checked="" type="checkbox"/> See Items 3 and 5 below.	
13	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9  36.8%*	
14	TYPE OF REPORTING PERSON (SEE INSTRUCTIONS)  CO	

\* Based on number of shares outstanding following consummation of the Business Combination (referenced below) on July 22, 2021.

1	NAMES OF REPORTING PERSONS MOUNT SINAI HEALTH SYSTEM, INC.	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (SEE INSTRUCTIONS)  (a) <input type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC USE ONLY	
4	SOURCE OF FUNDS  OO	
5	CHECK IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEMS 2(d) OR 2(e)  <input type="checkbox"/>	
6	CITIZENSHIP OR PLACE OF ORGANIZATION  New York	
Number of Shares Beneficially Owned By Each Reporting Person With	7	SOLE VOTING POWER  0
	8	SHARED VOTING POWER  0
	9	SOLE DISPOSITIVE POWER  0
	10	SHARED DISPOSITIVE POWER  0
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON  0	
12	CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES (SEE INSTRUCTIONS)  <input type="checkbox"/>	
13	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 9  0%	
14	TYPE OF REPORTING PERSON (SEE INSTRUCTIONS)  HC	

## Item 1. Security and Issuer

This Schedule 13D relates to the Class A common stock, par value \$0.0001 per share (the “Common Stock”), of Sema4 Holdings Corp. (“Sema4 Holdings” or “Issuer”), of which 240,190,402 shares were issued and outstanding immediately following consummation of the Business Combination (referenced below) as of July 22, 2021. The principal executive office of Sema4 Holdings is located at 333 Ludlow Street, North Tower, 8th Floor, Stamford, Connecticut 06902.

## Item 2. Identity and Background

- (a) This Schedule 13D is filed on behalf of the Icahn School of Medicine at Mount Sinai (“ISMMS”) and Mount Sinai Health System, Inc. (“MSHS”), who are collectively referred to herein as the “Reporting Persons”.

ISMMS is incorporated in the State of New York as a non-profit corporation.

MSHS is incorporated in the State of New York as a non-profit corporation and is the sole member of ISMMS. As the sole member of ISMMS, MSHS may be deemed to have beneficial ownership of securities held by ISMMS.

- (b) The address of the principal executive office of ISMMS is 1 Gustave L. Levy Place, New York, NY 10029.

The address of the principal executive office of MSHS is 150 East 42nd Street, Suite 2-B.17, New York, NY 10017.

- (c) ISMMS is an education corporation. MSHS has no business or operations other than serving as a holding company of the membership interests of its affiliates, and disclaims beneficial ownership of securities held by ISMMS.

- (d) During the last five years, neither of the Reporting Persons has been convicted in a criminal proceeding (excluding traffic violations or similar misdemeanors).

- (e) During the last five years, neither of the Reporting Persons has been a party to a civil proceeding of a judicial or administrative body of competent jurisdiction and as a result of such proceeding was or is subject to a judgment, decree or final order enjoining future violations of, or prohibiting or mandating activities subject to, federal or state securities laws or finding any violation with respect to such laws.

- (f) See Item 6 of the cover pages for citizenship or place of organization of each Reporting Person.

## Item 3. Source and Amount of Funds or Other Consideration

On July 22, 2021, ISMMS acquired beneficial ownership of 88,355,473<sup>1</sup> shares of Common Stock of Issuer (the “Shares”) in connection with the consummation of the transactions contemplated by that certain Agreement and Plan of Merger, dated February 9, 2021, by and among CM Life Sciences, Inc. (“CMLS”), S-IV Sub, Inc. (“Merger Sub”) and Mount Sinai Genomics, Inc. d/b/a Sema4 (“Sema4”) (as amended from time to time, the “Merger Agreement”). Pursuant to the terms of the Merger Agreement, Merger Sub merged with and into Sema4 with Sema4 surviving the merger as a wholly owned subsidiary of CMLS, which was renamed “Sema4 Holdings Corp.” (the “Merger” and together with the other transactions contemplated by the Merger Agreement, the “Business Combination”). On July 21, 2021, CMLS held a special meeting of stockholders, at which the CMLS stockholders considered and adopted, among other matters, a proposal to approve the Merger Agreement.

Sema4 was incorporated in the State of Delaware as a for-profit corporation on October 16, 2015, with limited operations focused on establishing the company as a capitalized, standalone entity. On June 1, 2017, Sema4 signed a contribution and funding agreement and other agreements with ISMMS whereby ISMMS contributed certain assets and liabilities related to Sema4’s operations, provided certain services to Sema4, and also committed to fund Sema4 up to \$55.0 million in future capital contributions in exchange for equity in Sema4. In connection with and as a result of the consummation of the Business Combination on July 22, 2021 (the “Closing Date”), Sema4 equity holders, including ISMMS, received shares of Common Stock of Issuer.

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<sup>1</sup> The Shares do not include up to 11,597,198 Earn-Out Shares (as defined in the Merger Agreement), which may be issued pursuant to the earn-out provisions of the Merger Agreement upon the occurrence of certain triggering events provided for therein.

The description of the Merger Agreement contained in this Item 4 is not intended to be complete and is qualified in its entirety by reference to such agreement, which is Exhibit 2.1 to the Registration Statement on Form S-1 (File No. 333-258467) filed August 4, 2021, and declared effective by the Securities and Exchange Commission on August 12, 2021 (the “S-1”), by Sema4 Holdings and is incorporated by reference herein.

#### **Item 4. Purpose of Transaction**

The Reporting Persons acquired the securities reported herein for investment purposes, subject to the following:

The information in Item 3 of this Schedule 13D is incorporated by reference into this Item 4. The Reporting Persons expect to evaluate on an ongoing basis the Issuer’s financial condition and prospects and their respective interests in, and intentions with respect to, the Issuer and their respective investments in the securities of Issuer, which review may be based on various factors, including Issuer’s business and financial condition, results of operations and prospects, general economic and industry conditions, the securities markets in general and those for Issuer’s securities in particular, as well as other developments and other investment opportunities. Accordingly, each Reporting Person reserves the right to change its intentions, as it deems appropriate. In particular, each Reporting Person may, subject to any restrictions on the Reporting Persons pursuant to the agreements entered into in connection with the Business Combination, at any time and from time to time, in the open market, in privately negotiated transactions or otherwise, increase its holdings in Issuer or dispose of all or a portion of the securities of Issuer that such Reporting Person now owns or may hereafter acquire, including sales pursuant to the exercise of the registration rights provided for in the Registration Rights Agreement (as defined below).

Except as described in this Schedule 13D, the Reporting Persons do not have any present plans or proposals that relate to or would result in any of the actions described in subparagraphs (a) through (j) of Item 4 of Schedule 13D, although, subject to the agreements described herein, the Reporting Persons, at any time and from time to time, may review, reconsider and change their position and/or change their purpose and/or develop such plans and may seek to influence management or the board of Issuer with respect to the business and affairs of Issuer and may from time to time consider pursuing or proposing such matters with advisors, Issuer or other persons.

#### **Item 5. Interest in Securities of the Issuer**

(a) and (b) Items 7 through 11 and 13 of each of the cover pages of this Schedule 13D are incorporated herein by reference. The information set forth in Item 4 of this Schedule 13D is hereby incorporated by reference into this Item 5.

Subject to the terms and conditions set forth in the Merger Agreement and upon consummation of the Business Combination, holders of Issuer’s Common Stock received certain rights to receive additional shares of Common Stock (“Earn-Out Shares”) upon achievement of certain milestones (each a “Triggering Event”), including the Common Stock share price, during the earn-out period, which ends on the 2-year anniversary of the closing of the Business Combination. Each Triggering Event may only occur once, if at all. Reporting Person may earn up to 11,597,198 Earn-Out Shares, which shares are excluded from the aggregate number of shares held by Reporting Person.

MSSH disclaims beneficial ownership over all Shares and Earn-Out Shares beneficially owned by ISMMS, other than for the purpose of determining obligations under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and the filing of this Schedule 13D shall not be deemed an admission that MSSH is the beneficial owner of such securities for any other purpose.

- (c) Except as described in Item 4 of this Schedule 13D, which is incorporated herein by reference, during the past 60 days, none of the Reporting Persons conducted transactions in the securities of the Issuer.
- (d) To the knowledge of the Reporting Persons, no one other than the Reporting Persons has the right to receive or the power to direct the receipt of dividends from, or the proceeds from the sale of, the securities of the Issuer reported as beneficially owned by the Reporting Persons herein.
- (e) Not applicable.

## **Item 6. Contracts, Arrangements, Understandings or Relationships With Respect to Securities of the Issuer**

The information set forth in Items 2, 3, 4 and 5 is hereby incorporated by reference into this Item 6. The Reporting Persons are party to the following contracts, agreements and understanding with respect to securities of the Company:

### *Lockup Agreement*

In connection with the execution of the Merger Agreement, ISMMS entered into a lockup agreement whereby ISMMS agreed not to (i) sell, offer to sell, contract or agree to sell, hypothecate pledge, grant any option to purchase or otherwise dispose of or agree to dispose of, directly or indirectly, or establish or increase a put equivalent position or liquidate or decrease a call equivalent position within the meaning of Section 16 of the Exchange Act, with respect to shares of Common Stock issued to ISMMS pursuant to the Merger Agreement, (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of any of such shares, in cash or otherwise, or (iii) publicly announce any intention to effect any transaction specified in clause (i) or (ii). In addition, ISMMS will take none of the foregoing actions until the earliest of (a) the date that is 180 calendar days from the Closing Date, and (b) the date following the Closing Date on which Issuer completes a liquidation, merger, stock exchange or other similar transaction that results in all of the our stockholders having the right to exchange their shares of our capital stock for cash, securities or other property. Notwithstanding the foregoing, ISMMS may take any of the actions specified in clauses (i), (ii) and (iii) above at any time after the first date on which the closing price of Issuer's Common Stock has equaled or exceeded \$12.00 per share (as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) for any 20 trading days within any 30-trading day period commencing at least 150 days after the Closing Date.

This summary description does not purport to be complete, and is qualified in its entirety by reference to the Form of Lock-Up Agreement, a copy of which is filed as Annex G to Issuer's DEFM14A, filed July 2, 2021

### *Registration Rights Agreement*

In connection with the execution of the Business Combination Agreement, CMLS (renamed Sema4 Holdings Corp.), CMLS Holdings and certain other parties thereto (collectively, the "Rights Holders") entered into an amended and restated registration rights agreement (as amended and restated, the "Registration Rights Agreement"), dated as of July 22, 2021, which amended and restated in its entirety the existing registration rights agreement, dated September 1, 2020, by and between CMLS and the parties thereto. Pursuant to the terms of the Registration Rights Agreement, CMLS filed the S-1 on August 4, 2021.

In addition, pursuant to the terms of the Registration Rights Agreement and subject to certain requirements and customary conditions, including with regard to the number of demand rights that may be exercised, the Rights Holders may demand at any time or from time to time, that the Issuer file a registration statement on Form S-1 or Form S-3 to register certain shares of the Common Stock held by such Rights Holders. The Registration Rights Agreement also provides the Rights Holders with "piggy-back" registration rights, subject to certain requirements and customary conditions. The Issuer will bear the expenses incurred in connection with the filing of any such registration statement.

This summary description does not purport to be complete, and is qualified in its entirety by reference to the Form of Amended and Restated Registration Rights Agreement, a copy of which is filed as Exhibit 10. 5 to Issuer's Current Report on Form 8-K, filed February 11, 2021.

## **Item 7. Material to Be Filed as Exhibits**

None.

**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: October 13, 2021

**ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI**

By: /s/ Stephen Harvey

Name: Stephen Harvey

Title: Executive Vice President of Finance

Dated: October 13, 2021

**MOUNT SINAI HEALTH SYSTEM**

By: /s/ Stephen Harvey

Name: Stephen Harvey

Title: Interim CFO

**Attention: Intentional misstatements or omissions of fact constitute Federal criminal violations (See 18 U.S.C. 1001)**