
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

SCHEDULE 13D/A

Under the Securities Exchange Act of 1934
(Amendment No. 1)*

MOLECULAR TEMPLATES, INC.

(Name of Issuer)

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

608550 109
(CUSIP Number)

Patrick G. Enright
Managing Member
Longitude Capital Partners III, LLC
2740 Sand Hill Road, 2nd Floor
Menlo Park, CA 94025
(650) 854-5700

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

September 21, 2018

(Date of Event Which Requires Filing of this Statement)

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 .

*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).

(Continued on following pages)

(Page 1 of 10 Pages)

1	NAMES OF REPORTING PERSONS Longitude Capital Partners III, LLC	
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 (see instructions) OO ¹	
5	CHECK IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 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 4,709,802 ²
	9	SOLE DISPOSITIVE POWER 0
	10	SHARED DISPOSITIVE POWER 4,709,802 ²
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 4,709,802 ²	
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 12.4% ³	
14	TYPE OF REPORTING PERSON (see instructions) OO	

¹ The securities over which the Reporting Persons have shared voting and dispositive power were acquired using investment funds from limited partner investors of Longitude Venture III.

² Consists of (a) 3,261,535 outstanding shares of Common Stock, and (b) 1,448,267 shares of Common Stock issuable upon exercise of Warrants.

³ The percentage was calculated based on 37,943,465 shares of Common Stock, as follows: (a) 36,495,198 outstanding shares of Common Stock as of immediately after giving effect to the Offering, as disclosed by the Issuer in its Prospectus Supplement; *plus* (b) 1,448,267 shares of Common Stock issuable upon exercise of the Warrants beneficially owned by the Reporting Persons.

1	NAMES OF REPORTING PERSONS	
	Longitude Venture Partners III, L.P.	
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 (see instructions)	
	OO ¹	
5	CHECK IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 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
		4,709,802 ²
	9	SOLE DISPOSITIVE POWER
		0
	10	SHARED DISPOSITIVE POWER
		4,709,802 ²
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON	
	4,709,802 ²	
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	
	12.4% ³	
14	TYPE OF REPORTING PERSON (see instructions)	
	PN	

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1	NAMES OF REPORTING PERSONS David Hirsch	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (see instructions) <div style="text-align: right;">(a) <input type="checkbox"/> (b) <input type="checkbox"/></div>	
3	SEC USE ONLY	
4	SOURCE OF FUNDS (see instructions) OO ¹	
5	CHECK IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 2(d) or 2(e) <div style="text-align: right;"><input type="checkbox"/></div>	
6	CITIZENSHIP OR PLACE OF ORGANIZATION United States of America	
	7	SOLE VOTING POWER 0
	8	SHARED VOTING POWER 4,722,302 ²
	9	SOLE DISPOSITIVE POWER 0
	10	SHARED DISPOSITIVE POWER 4,722,302 ²
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 4,722,302 ²	
12	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (11) EXCLUDES CERTAIN SHARES (see instructions) <div style="text-align: right;"><input type="checkbox"/></div>	
13	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW 11 12.4% ³	
14	TYPE OF REPORTING PERSON (see instructions) IN	

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² Consists of (a) 3,261,535 outstanding shares of Common Stock, (b) 1,448,267 shares of Common Stock issuable upon exercise of Warrants, and (c) 12,500 shares of Common Stock subject to stock options granted to Dr. Hirsch in his capacity as a director of the Issuer that are exercisable as of September 21, 2018 or within 60 days thereafter.

³ The percentage was calculated based on 37,955,965 shares of Common Stock, as follows: (a) 36,495,198 outstanding shares of Common Stock as of immediately after giving effect to the Offering, as disclosed by the Issuer in its Prospectus Supplement; *plus* (b) 1,448,267 shares of Common Stock issuable upon exercise of the Warrants beneficially owned by the Reporting Persons; *plus* (c) 12,500 shares of Common Stock subject to stock options granted to Dr. Hirsch in his capacity as a director of the Issuer that are exercisable as of September 21, 2018 or within 60 days thereafter.

1	NAMES OF REPORTING PERSONS Patrick G. Enright	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (see instructions) <div style="text-align: right;">(a) <input type="checkbox"/> (b) <input type="checkbox"/></div>	
3	SEC USE ONLY	
4	SOURCE OF FUNDS (see instructions) OO ¹	
5	CHECK IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 2(d) or 2(e) <div style="text-align: right;"><input type="checkbox"/></div>	
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 4,722,302 ²
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	10	SHARED DISPOSITIVE POWER 4,722,302 ²
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14	TYPE OF REPORTING PERSON (see instructions) IN	

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1	NAMES OF REPORTING PERSONS Juliet Tammenoms Bakker	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (see instructions) <div style="text-align: right;">(a) <input type="checkbox"/> (b) <input type="checkbox"/></div>	
3	SEC USE ONLY	
4	SOURCE OF FUNDS (see instructions) OO ¹	
5	CHECK IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 2(d) or 2(e) <div style="text-align: right;"><input type="checkbox"/></div>	
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 4,722,302 ²
	9	SOLE DISPOSITIVE POWER 0
	10	SHARED DISPOSITIVE POWER 4,722,302 ²
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 4,722,302 ²	
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14	TYPE OF REPORTING PERSON (see instructions) IN	

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² Consists of (a) 3,261,535 outstanding shares of Common Stock, (b) 1,448,267 shares of Common Stock issuable upon exercise of Warrants, and (c) 12,500 shares of Common Stock subject to stock options granted to Dr. Hirsch in his capacity as a director of the Issuer that are exercisable as of September 21, 2018 or within 60 days thereafter.

³ The percentage was calculated based on 37,955,965 shares of Common Stock, as follows: (a) 36,495,198 outstanding shares of Common Stock as of immediately after giving effect to the Offering, as disclosed by the Issuer in its Prospectus Supplement; *plus* (b) 1,448,267 shares of Common Stock issuable upon exercise of the Warrants beneficially owned by the Reporting Persons; *plus* (c) 12,500 shares of Common Stock subject to stock options granted to Dr. Hirsch in his capacity as a director of the Issuer that are exercisable as of September 21, 2018 or within 60 days thereafter.

Explanatory Note:

This Amendment No. 1 to Schedule 13D (“Amendment No. 1”) amends and supplements the Schedule 13D initially filed with the Securities and Exchange Commission (the “Commission”) on September 18, 2017 (the “Statement”). This Amendment No. 1 is filed on behalf of entities Longitude Venture Partners III, L.P. (“Longitude Venture III”), and Longitude Venture III’s sole general partner Longitude Capital Partners III, LLC (“Longitude Capital III”), and each of Longitude Capital III and Longitude Venture III, a “Reporting Entity”), and individuals David Hirsch, Patrick G. Enright and Juliet Tammenoms Bakker (each a “Reporting Individual,” and each Reporting Entity or Reporting Individual, a “Reporting Person”), relating to beneficial ownership of the common stock, par value \$0.001 per share (the “Common Stock”), of Molecular Templates, Inc., a Delaware corporation (the “Issuer”). The Reporting Persons are filing this Amendment No. 1 to report changes in their beneficial ownership since the filing of the Statement. Except as set forth below, this Amendment No. 1 does not supplement, restate or amend any of the other information disclosed in the Statement as previously filed. Capitalized terms not defined in this Amendment No. 1 have the meanings ascribed to them in the Statement as previously filed.

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

Item 3 is amended by adding the following to the end thereof:

On September 21, 2018, Longitude Venture III purchased 365,000 shares of Common Stock from the Issuer as part of the Issuer’s underwritten public offering of its Common Stock (the “Offering”), for a purchase price of \$5.50 per share and an aggregate purchase price of \$2,007,500. All such shares were purchased by Longitude Venture III using investment funds provided to Longitude Venture III by its limited partner investors.

Item 4. Purpose of Transaction.

Item 4 is amended by adding the following to the end thereof:

The information set forth in Item 3 of Amendment No. 1 is incorporated herein by reference.

Item 5. Interest in Securities of the Issuer.

Items 5(a), (b) and (c) are amended and restated in full to read as follows:

(a) According to the Issuer’s prospectus supplement dated September 20, 2018 and filed with the Commission on September 24, 2018 (the “Prospectus Supplement”), immediately after giving effect to the Offering, there were 36,495,198 outstanding shares of Common Stock.

Longitude Venture III is the record holder of 3,261,535 shares of Common Stock and Warrants to purchase up to 1,448,267 shares of Common Stock, which represents beneficial ownership of an aggregate of 4,709,802 shares of Common Stock and approximately 12.4% of the Common Stock.

Longitude Capital III, as the general partner of Longitude Venture III, has the power to vote and dispose of securities held by Longitude Venture III and may be deemed to beneficially own the securities held of record by Longitude Venture III.

The Reporting Individuals are members of Longitude Capital III and Mr. Enright and Ms. Bakker are the managing members of Longitude Capital III. The Reporting Individuals share the decision-making power of Longitude Capital III with respect to the voting and disposition of the Issuer’s securities beneficially owned by Longitude Capital III. As a result, each of Dr. Hirsch, Mr. Enright and Ms. Bakker may be deemed to beneficially own the securities held of record by Longitude Venture III. In addition, the Reporting Individuals beneficially own 12,500 shares of Common Stock subject to stock options granted to Dr. Hirsch in his capacity as a director of the Issuer that are exercisable as of September 21, 2018 or within 60 days thereafter. As a result, each of the Reporting Individuals beneficially owns an aggregate of 4,722,302 shares of Common Stock and approximately 12.4% of the Common Stock.

(b) Each of the Reporting Persons has shared power to vote and dispose of an aggregate of 4,709,802 shares of Common Stock, consisting of 3,261,535 shares of Common Stock and Warrants to purchase up to 1,448,267 shares of Common Stock. In addition, each of the Reporting Individuals has shared power to vote and dispose of an additional 12,500 shares of Common Stock subject to stock options granted to Dr. Hirsch in his capacity as a director of the Issuer that are exercisable as of September 21, 2018 or within 60 days thereafter, resulting in an aggregate of 4,722,302 shares of Common Stock.

(c) Except as reported in this Statement, none of the Reporting Persons has effected any transactions in the Issuer's securities within the past 60 days.

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

Item 6 is amended by adding the following to the end thereof:

The information set forth in Items 3 and 4 of Amendment No. 1 is incorporated herein by reference.

Pursuant to the Issuer's compensation policy for non-employee directors adopted on October 9, 2017, Dr. Hirsch, in his capacity as such a director, receives cash compensation, including an annual retainer for service as a member of the Board and supplemental annual retainers for membership and chair positions on certain of the Board's committees, and equity compensation, including stock option or other equity awards granted upon appointment as a director and on an annual basis. The above summary of such compensation policy is qualified by reference to the full text of the policy, which is filed or incorporated by reference as an exhibit hereto.

In connection with the Offering, each of Longitude Venture III and Dr. Hirsch has entered into a lock-up agreement, pursuant to which each such party is prohibited from disposing of, announcing the intention to dispose of or hedging any Common Stock (or securities convertible into or exchangeable or exercisable for shares of Common Stock) for a period of 90 days after September 20, 2018, except with the prior written consent of Cowen and Company, LLC and Evercore Group L.L.C., certain of the underwriters of the Offering, and subject to certain other limited exceptions. The terms and provisions of such lock-up agreement are described more fully in the Prospectus Supplement, and the above summary is qualified by reference to such description and the full text of the agreement, which is filed or incorporated by reference as an exhibit hereto.

Item 7. Material to be Filed as Exhibits.

- Exhibit 1: Joint Filing Agreement, dated September 18, 2017, by and among the Reporting Persons (incorporated by reference to Exhibit 1 to the Statement filed with the Commission on September 18, 2017).
 - Exhibit 2: Securities Purchase Agreement, dated August 1, 2017, by and among the Issuer and the investors named therein (incorporated by reference to Exhibit 10.2 to Issuer's Current Report on Form 8-K filed with the Commission on August 7, 2017).
 - Exhibit 3: Form of Warrant issued in the Financing (incorporated by reference to Exhibit 10.4 to Issuer's Current Report on Form 8-K filed with the Commission on August 7, 2017).
 - Exhibit 4: Registration Rights Agreement, dated August 1, 2017, by and among the Issuer and the investors named therein (incorporated by reference to Exhibit 10.3 to Issuer's Current Report on Form 8-K filed with the Commission on August 7, 2017).
 - Exhibit 5: Equity Commitment Letter, dated March 16, 2017, by and among the Issuer, Private Molecular and Longitude Venture III (incorporated by reference to Exhibit 10.1 to the Issuer's Quarterly Report on Form 10-Q filed with the Commission on May 15, 2017).
 - Exhibit 6: Form of Indemnification Agreement (incorporated by reference to Exhibit 10.1 to the Issuer's Current Report on Form 8-K filed with the Commission on August 7, 2017).
 - Exhibit 7: Amended and Restated Non-Employee Director Compensation Policy, adopted by the Board of Directors of the Company on October 9, 2017 (incorporated by reference to Exhibit 10.2 to the Issuer's Current Report on Form 8-K filed with the Commission on October 13, 2017).
 - Exhibit 8: 2014 Equity Incentive Plan, as amended (incorporated by reference to Exhibit 10.1 to the Issuer's Current Report on Form 8-K filed with the Commission on October 13, 2017).
 - Exhibit 9: Form of Stock Option Grant Notice and Option Agreement for non-employee directors under the 2014 Equity Incentive Plan (incorporated by reference to Exhibit 10.8 to the Issuer's Annual Report on Form 10-K filed with the Commission on March 30, 2018).
 - Exhibit 10: 2018 Equity Incentive Plan (incorporated by reference to Exhibit 10.1 to the Issuer's Current Report on Form 8-K filed with the Commission on June 1, 2018).
-

- Exhibit 11: Form of Stock Option Grant Notice and Option Agreement for non-employee directors under the 2018 Equity Incentive Plan (incorporated by reference to Exhibit 4.7 to the Issuer's Registration Statement on Form S-8 (File No. 333-225826) filed with the Commission on June 22, 2018).
- Exhibit 12: Form of Lock-Up Agreement (incorporated by reference to Exhibit I to Exhibit 1.1 to the Issuer's Current Report on Form 8-K filed with the Commission on September 24, 2018).
-

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: September 26, 2018

LONGITUDE VENTURE PARTNERS III, L.P.

By: LONGITUDE CAPITAL PARTNERS III, LLC
Its: General Partner

By: /s/ Patrick G. Enright
Patrick G. Enright, Managing Member

LONGITUDE CAPITAL PARTNERS III, LLC

By: /s/ Patrick G. Enright
Patrick G. Enright, Managing Member

/s/ David Hirsch
David Hirsch

/s/ Patrick G. Enright
Patrick G. Enright

/s/ Juliet Tammenoms Bakker
Juliet Tammenoms Bakker
