

INITIAL STATEMENT OF BENEFICIAL OWNERSHIP OF SECURITIES

Filed pursuant to Section 16(a) of the Securities Exchange Act of 1934 or Section 30(h) of the Investment Company Act of 1940

(Print or Type Responses)

1. Name and Address of Reporting Person* Longitude Capital Partners III, LLC (Last) (First) (Middle) 800 EL CAMINO, SUITE 220 (Street) MENLO PARK, CA 94025 (City) (State) (Zip)	2. Date of Event Requiring Statement (Month/Day/Year) 08/01/2017	3. Issuer Name and Ticker or Trading Symbol Molecular Templates, Inc. [MTEM]		
		4. Relationship of Reporting Person(s) to Issuer (Check all applicable) <input type="checkbox"/> Director <input checked="" type="checkbox"/> 10% Owner <input type="checkbox"/> Officer (give title below) <input type="checkbox"/> Other (specify below)	5. If Amendment, Date Original Filed(Month/Day/Year)	
			6. Individual or Joint/Group Filing(Check Applicable Line) <input type="checkbox"/> Form filed by One Reporting Person <input checked="" type="checkbox"/> Form filed by More than One Reporting Person	

Table I - Non-Derivative Securities Beneficially Owned

1. Title of Security (Instr. 4)	2. Amount of Securities Beneficially Owned (Instr. 4)	3. Ownership Form: Direct (D) or Indirect (I) (Instr. 5)	4. Nature of Indirect Beneficial Ownership (Instr. 5)
Common Stock	2,896,535	I (u)	By Longitude Venture Partners III, L.P. (u)

Reminder: Report on a separate line for each class of securities beneficially owned directly or indirectly.

SEC 1473 (7-02)

Persons who respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB control number.

Table II - Derivative Securities Beneficially Owned (e.g., puts, calls, warrants, options, convertible securities)

1. Title of Derivative Security (Instr. 4)	2. Date Exercisable and Expiration Date (Month/Day/Year)		3. Title and Amount of Securities Underlying Derivative Security (Instr. 4)		4. Conversion or Exercise Price of Derivative Security	5. Ownership Form of Derivative Security: Direct (D) or Indirect (I) (Instr. 5)	6. Nature of Indirect Beneficial Ownership (Instr. 5)
	Date Exercisable	Expiration Date	Title	Amount or Number of Shares			
Warrants	08/01/2017	08/01/2024	Common Stock	1,448,267	\$ 6.8423	I (u)	By Longitude Venture Partners III, L.P. (u)

Reporting Owners

Reporting Owner Name / Address	Relationships			
	Director	10% Owner	Officer	Other
Longitude Capital Partners III, LLC 800 EL CAMINO, SUITE 220 MENLO PARK, CA 94025		X		
ENRIGHT PATRICK G 800 EL CAMINO REAL SUITE 220 MENLO PARK, CA 94025		X		
Tammenoms Bakker Juliet 800 EL CAMINO REAL SUITE 220 MENLO PARK, CA 94025		X		
Longitude Venture Partners III, L.P. 800 EL CAMINO REAL, SUITE 220 MENLO PARK, CA 94025		X		

Signatures

/s/ Patrick G. Enright, Managing Member of Longitude Capital III	08/07/2017
Signature of Reporting Person	Date
/s/ Patrick G. Enright	08/07/2017

Signature of Reporting Person

Date

/s/ Juliet Tammenoms Bakker

08/07/2017

Signature of Reporting Person

Date

/s/ Patrick G. Enright, Managing Member of Longitude Capital III, General Partner of Longitude Venture III

08/07/2017

Signature of Reporting Person

Date

Explanation of Responses:

* If the form is filed by more than one reporting person, *see* Instruction 5(b)(v).

** Intentional misstatements or omissions of facts constitute Federal Criminal Violations. *See* 18 U.S.C. 1001 and 15 U.S.C. 78ff(a).

(1) This report is filed jointly by Longitude Capital Partners III, LLC ("Longitude Capital III"), Longitude Venture Partners III, L.P. ("Longitude Venture III"), Patrick G. Enright ("Mr. Enright"), and Juliet Tammenoms Bakker ("Ms. Bakker"), all of whom share beneficial ownership of more than 10% of the capital stock of the Issuer. Longitude Capital III is the general partner of Longitude Venture III and may be deemed to share voting and investment power over the shares held by Longitude Venture III. Mr. Enright and Ms. Bakker are the managing members of Longitude Capital III and may be deemed to share voting and investment power over the shares held by Longitude Venture III. Each of Longitude Capital III, Mr. Enright and Ms. Bakker disclaims beneficial ownership of such shares except to the extent of its, his or her pecuniary interest therein.

Note: File three copies of this Form, one of which must be manually signed. If space is insufficient, *See* Instruction 6 for procedure.

Potential persons who are to respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB number.