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**United States**  
**SECURITIES AND EXCHANGE COMMISSION**  
WASHINGTON, D.C. 20549

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**SCHEDULE 13G**

Under the Securities Exchange Act of 1934

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**MOLECULAR TEMPLATES, INC.**

(Name of Issuer)

**Common Stock**  
(Title of Class of Securities)

**608550109**  
(CUSIP Number)

**January 24, 2020**  
(Date of Event Which Requires Filing This Statement)

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Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

- Rule 13d-1(b)  
 Rule 13d-1(c)  
 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).

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1.	Names of Reporting Persons <b>BB Biotech AG</b>	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input checked="" type="checkbox"/> (b) <input type="checkbox"/>	
3.	SEC Use Only	
4.	Citizenship or Place of Organization <b>Switzerland</b>	
Number of Shares Beneficially Owned by Each Reporting Person with:	5.	Sole Voting Power <b>0</b>
	6.	Shared Voting Power <b>2,161,152</b>
	7.	Sole Dispositive Power <b>0</b>
	8.	Shared Dispositive Power <b>2,161,152</b>
9.	Aggregate Amount Beneficially Owned by Each Reporting Person <b>2,161,152</b>	
10.	Check if the Aggregate Amount in Row (9) Excludes Certain Shares <input type="checkbox"/>	
11.	Percent of Class Represented by amount in Row (9) <b>5.03%</b>	
12.	Type of Reporting Person (See Instructions) <b>HC,CO</b>	

1.	Names of Reporting Persons <b>Biotech Target N.V.</b>  I.R.S. Identification Nos. of above persons (entities only):  <b>N/A</b>	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input checked="" type="checkbox"/> (b) <input type="checkbox"/>	
3.	SEC Use Only	
4.	Citizenship or Place of Organization  <b>Curacao</b>	
Number of Shares Beneficially Owned by Each Reporting Person with:	5.	Sole Voting Power  <b>0</b>
	6.	Shared Voting Power  <b>2,161,152</b>
	7.	Sole Dispositive Power  <b>0</b>
	8.	Shared Dispositive Power  <b>2,161,152</b>
9.	Aggregate Amount Beneficially Owned by Each Reporting Person  <b>2,161,152</b>	
10.	Check if the Aggregate Amount in Row (9) Excludes Certain Shares  <input type="checkbox"/>	
11.	Percent of Class Represented by amount in Row (9)  <b>5.03%</b>	
12.	Type of Reporting Person (See Instructions)  <b>CO</b>	

**Item 1**

- 1(a) **Name of Issuer:** Molecular Templates, Inc.
- 1(b) **Address of Issuer's Principal Executive Offices:**  
9301 Amberglen Blvd, Suite 100, Austin, TX 78729

**Item 2**

- 2(a) **Name of Person Filing:** BB Biotech AG ("BB Biotech") on behalf of its wholly-owned subsidiary, Biotech Target N.V. ("Biotech Target").
- 2(b) **Address of Principal Business Office or, if none, Residence:**  
BB Biotech AG: Schwertstrasse 6, CH-8200 Schaffhausen, Switzerland  
Biotech Target N.V.: Ara Hill Top Building, Unit A-5, Pletterijweg Oost 1, Curaçao
- 2(c) **Citizenship:** BB Biotech AG: Switzerland  
Biotech Target N.V.: Curacao
- 2(d) **Title of Class of Securities** Common Stock, USD 0.001
- 2(e) **CUSIP Number** 608550109

**Item 3**

**If this statement is filed pursuant to Rule 13d-1(b), or 13d-2(b) or (c), check whether the person filing is a:**

- a.  **Broker or Dealer registered under Section 15 of the Act.**
- b.  **Bank as defined in Section 3(a)(6) of the Act.**
- c.  **Insurance company as defined in Section 3(a)(19) of the Act.**
- d.  **Investment company registered under section 8 of the Investment Company Act of 1940.**
- e.  **An investment adviser in accordance with Rule 13d-1(b)(1)(ii)(E);**
- f.  **An employee benefit plan or endowment fund in accordance with Rule 13d-1(b)(1)(ii)(F);**
- g.  **A parent holding company or control person in accordance with Rule 13d-1(b)(1)(ii)(G);**
- h.  **A savings associations as defined in Section 3(b) of the Federal Deposit Insurance Act (12 U.S.C. 1813);**
- i.  **A church plan that is excluded from the definition of an investment company under section 3(c)(14) of the Investment Company Act of 1940;**
- j.  **Group, in accordance with Rule 13d-1(b)(1)(ii)(J).**

**Item 4. Ownership**

Provide the following information regarding the aggregate number and percentage of the class of securities of the issuer identified in Item 1.

- (a) Amount beneficially owned: 2,161,152
- (b) Percent of class: 5.03%
- (c) Number of shares as to which the person has:
  - (i) Sole power to vote or to direct the vote 0
  - (ii) Shared power to vote or to direct the vote 2,161,152
  - (iii) Sole power to dispose or to direct the disposition of 0
  - (iv) Shared power to dispose or to direct the disposition of 2,161,152

**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:

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

N/A

**Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on By the Parent Holding Company or Control Person.**

This statement is filed jointly by BB Biotech and Biotech Target, Biotech Target is a wholly-owned subsidiary of BB Biotech.

**Item 8. Identification and Classification of Members of the Group**

N/A

**Item 9. Notice of Dissolution of Group**

N/A

**Item 10. Certification**

By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of the issuer of the securities and were not acquired and are not held in connection with or as a participant in any transaction having that purpose or effect.

**SIGNATURES**

After reasonable inquiry and the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

**BB Biotech AG**

Date: **January 28, 2020**

By:         /s/ Martin Gubler          
Signatory Authority

Name:         Martin Gubler        

Title:         Signatory Authority        

Date: **January 28, 2020**

By:         /s/ Ivo Betschart          
Signatory Authority

Name:         Ivo Betschart        

Title:         Signatory Authority        

**Biotech Target N.V.**

Date: **January 28, 2020**

By:         /s/ Jan Bootsma          
Signatory Authority

Name:         Jan Bootsma        

Title:         Signatory Authority        

Date: **January 28, 2020**

By:         /s/ Hugo van Neutegem          
Signatory Authority

Name:         Hugo van Neutegem        

Title:         Signatory Authority

Exhibit A

**Joint Filing Statement**

We, the undersigned, hereby express our agreement that the attached Schedule 13G (including all amendments thereto) is filed on behalf of each of the undersigned.

**BB Biotech AG**

Date: January 28, 2020

By: /s/ Martin Gubler  
Signatory Authority

Name: Martin Gubler

Title: Signatory Authority

Date: January 28, 2020

By: /s/ Ivo Betschart  
Signatory Authority

Name: Ivo Betschart

Title: Signatory Authority

**Biotech Target N.V.**

Date: January 28, 2020

By: /s/ Jan Bootsma  
Signatory Authority

Name: Jan Bootsma

Title: Signatory Authority

Date: January 28, 2020

By: /s/ Hugo van Neutegem  
Signatory Authority

Name: Hugo van Neutegem

Title: Signatory Authority