March 15, 2018

New Data on Molecular Templates' Engineered Toxin Bodies to be Presented at the American Association of Cancer Research (AACR) Annual Meeting 2018

Presentations will feature data on 1) the company's Antigen Seeding Technology (AST) platform, and 2) MT-5111, an Engineered Toxin Body with a novel MOA against HER2 positive cancers

AUSTIN, Texas, March 15, 2018 (GLOBE NEWSWIRE) -- Molecular Templates, Inc., (Nasdaq:MTEM) a clinical stage biopharmaceutical company focused on the discovery and development of Engineered Toxin Bodies, a new class of targeted biologic therapies that possess unique mechanisms of action in oncology, today announced that new data on two of its pipeline programs will be presented at the American Association of Cancer Research (AACR) Annual Meeting 2018, to be held April 14-18 at McCormick Place North/South in Chicago, Illinois.

Molecular Templates has utilized the ability of its Engineered Toxin Bodies (ETBs) to route to the endoplasmic reticulum and cytoplasm to deliver cytomegalovirus (CMV) foreign antigen for presentation in the context of MHC class I molecules on tumor cells. This Antigen Seeding Technology (AST) allows for the targeted delivery, intracellular processing, and surface MHC-I presentation of CMV antigen and subsequent destruction of tumors via a CMV-specific T lymphocyte response.

Preclinical data on the company's PD-L1 targeted ETB incorporating AST will be presented at the AACR meeting. This molecule has been engineered to both destroy PD-L1-expressing tumor cells via ribosomal destruction and to deliver the immunodominant HLA:A02 restricted cytomegalovirus (CMV) protein-pp65 for MHC-I presentation on these cells. The dual mechanisms of action against the PD-L1 target allow for a more potent and complete destruction of tumor cells. Molecular Templates expects this program to enter the clinic in the first half of 2019.

"We are excited by this wholly novel approach to immuno-oncology," said Eric Poma, Ph.D., CEO and CSO of Molecular Templates. "Antigen seeding is a way to target an immense, activated T-cell repertoire to the tumor without having to overcome T-cell exhaustion or stimulate antigen presentation from APCs. We are looking forward moving to this approach into the clinic."

Date:	Monday, April 16
Time:	1:00pm – 5:00pm Central Time
Session:	PO.IMO2.11 – Therapeutic Antibodies, Including Engineered Antibodies 2

Location: Section 34
Poster Title: *Antigen Seeding Technology by Engineered Toxin Bodies Provides a Targeted Immuno-Oncology Approach for Treatment of Cancers*
Authors: Brigitte Brieschke, Sangeetha Rajagopalan, Garrett L. Robinson, Erin K. Willert, Hilario J. Ramos

Molecular Templates will also present on its HER2 engineered toxin body program. MT-5111, a HER2-targeted ETB with picomolar potency against HER2 expressing cells, was designed to overcome mechanisms of resistance to current HER2 targeting modalities such as escape from antibody dependent cell-mediated cytotoxicity (ADCC), alterations in signal transduction, epitope masking, and enhanced small molecule efflux. Additionally, MT-5111 was genetically engineered to reduce the anti-drug antibody response and signaling through innate receptors, allowing for repeat dosing.

In vitro and *in vivo* data will be presented at the AACR meeting, highlighting the potential for MT-5111 as a novel agent in development for treatment of breast carcinomas and other malignancies overexpressing the HER2 receptor. Molecular Templates intends to file an IND with MT-5111 in 2018.

“Antibody, small molecule, and ADC approaches to HER2 have all shown meaningful benefit in patients with HER2+ cancers but ultimately cease to work in most patients even though HER2 expression persists,” said Eric Poma, Ph.D., CEO and CSO of Molecular Templates. “We believe the unique mechanism of action of our HER2 ETB may circumvent mechanisms of resistance to the other HER2 modalities.”

Date: Wednesday, April 18
Time: 8:00am – 12:00pm Central Time
Session: PO.ET01.02 – Antibodies, Fusion Proteins, and Related Biologics
Location: Section 35
Poster Title: *Targeted Engineered Toxin Bodies Provide a Novel Mechanism of Action Against HER2 Positive Cancers*
Authors: Brigitte Brieschke, Garrett L. Robinson, Sangeetha Rajagopalan, Hilario J. Ramos, Jensing Liu, Jack P. Higgins, Erin K. Willert

About Molecular Templates
Molecular Templates is focused on the discovery, development and commercialization of next-generation immunotoxins called Engineered Toxin Bodies (ETBs) for the treatment of cancers and other serious diseases. For additional information, please visit Molecular Templates’ website at www.mtem.com.

Forward-Looking Statements
This press release contains forward-looking statements that involve substantial risks and uncertainties. All statements, other than statement of historical facts, included in this press release regarding Molecular Templates’ strategy, future operations and plans are forward-looking statements. Examples of such statements include, but are not limited to, statements relating to the development, potential benefits and uses of and markets for Molecular Templates’ product candidates, including MT-3724, MT-4019 and evofosfamide, and anticipated clinical trials, including timing and potential results. Actual results or events could differ materially from the plans, intentions, expectations and projections disclosed in the forward-looking statements. Various important factors could cause actual results or

events to differ materially from the forward-looking statements that Molecular Templates makes, including, but not limited to, the risk that trials and studies may be delayed and may not have satisfactory outcomes, potential adverse effects arising from the testing or use of MT-3724, MT-4019 and evofosfamide and other risks described in the “Risk Factors” section of Molecular Templates’ most recent 10-K, 10-Q, and other reports on file with the SEC. Molecular Templates does not assume any obligation to update any forward-looking statements, except as required by law.

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