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Atara Biotherapeutics Exclusively Licenses Mesothelin-Targeted CAR T Immunotherapy for Solid Tumors

Initial results from ongoing Phase 1 study for mesothelin-targeted CAR T support activity and safety in patients with advanced solid tumors

Atara's next-generation CAR T collaboration with MSK to develop mesothelin-targeted CAR T using novel co-stimulatory domain and checkpoint inhibition technologies

Atara advancing four next-generation CAR T oncology programs toward INDs

SOUTH SAN FRANCISCO, Calif., Jan. 03, 2019 (GLOBE NEWSWIRE) -- Atara Biotherapeutics, Inc. (Nasdaq: ATRA), a leading off-the-shelf, allogeneic T-cell immunotherapy company developing novel treatments for patients with cancer, autoimmune and viral diseases, today announced that it has exclusively licensed worldwide rights to a mesothelin-targeted chimeric antigen receptor T-cell (CAR T) immunotherapy for solid tumors from Memorial Sloan Kettering Cancer Center (MSK). The most advanced program in Atara's CAR T collaboration with MSK will focus on development of a next-generation, mesothelin-targeted CAR T using novel 1XX CAR signaling domain and PD-1 dominant negative receptor (DNR) checkpoint inhibition technologies for patients with mesothelin-associated solid tumors.

"We are excited by the promising initial clinical results of the mesothelin-directed CAR T approach and believe mesothelin, an antigen well recognized as associated with aggressive solid tumors, is a promising target for developing a next-generation CAR T incorporating our PD-1 DNR technology," said Prasad S. Adusumilli, M.D., FACS, Deputy Chief of Thoracic Service, Director of Mesothelioma Program and Head of Solid Tumors Cell Therapy at the Cellular Therapeutics Center at MSK.

PD-1 DNRs are modified PD-1 receptors that lack inhibitory function and are designed to enhance CAR T efficacy in solid tumors without the need for development of a CAR T in combination with a PD-1 checkpoint inhibitor. Animal models have demonstrated that CAR T immunotherapies with a PD-1 DNR result in enhanced activity against solid tumors[1].

"We look forward to collaborating with Atara to develop a next-generation mesothelin-targeted CAR T immunotherapy," said Michel Sadelain, M.D., Ph.D., Director, Center for Cell Engineering, and Head, Gene Expression and Gene Transfer Laboratory at MSK. "Our novel mesothelin 1XX CAR is designed to extend functional CAR T cell persistence by sustaining T cell effector functions without precipitating exhaustion, provides a complementary technology to tackle challenging tumor microenvironments."

Mesothelin is a solid tumor-associated antigen that is expressed at high levels on the surface of cells in aggressive solid tumors including mesothelioma, triple-negative breast cancer,

esophageal cancer, pancreatic cancer and non-small cell lung cancer. Initial results from an ongoing MSK investigator-sponsored Phase 1 study (NCT02414269) of a mesothelin-targeted CAR T immunotherapy for patients with malignant pleural cancers were presented at the 2018 American Society of Gene and Cell Therapy (ASGCT) Annual Meeting and support activity and safety in patients with advanced mesothelioma[2,3]. This ongoing Phase 1 dose-escalation study continues to accrue patients and enhanced response rates were observed when patients were subsequently treated with pembrolizumab, a PD-1 checkpoint inhibitor. MSK is also investigating mesothelin-targeted CAR T cells for patients with advanced breast and lung cancer (NCT02792114). Additional results from these ongoing studies are expected to be presented at upcoming scientific congresses.

“Our CAR T strategy includes collaboration with investigators on cutting-edge technologies to advance programs with near-term clinical potential,” said Dietmar Berger, M.D., Ph.D., Global Head of Research and Development of Atara Biotherapeutics. “Based on the encouraging MSK Phase 1 clinical experience, we are progressing a next-generation, mesothelin-targeted CAR T that leverages MSK technologies designed to further enhance responses in patients with mesothelioma and other advanced solid tumors. We are also developing three additional next-generation and off-the-shelf, allogeneic CAR T immunotherapies in oncology for patients with acute myelogenous leukemia (AML) and B-cell malignancies, leveraging Atara’s world-class T cell manufacturing capabilities and research expertise.”

In the MSK investigator-sponsored Phase 1 study presented at the 2018 ASGCT Annual Meeting, patients with malignant pleural cancers were administered a mesothelin-targeted autologous CAR T immunotherapy regionally into the chest cavity following cyclophosphamide pre-conditioning (NCT02414269). Of the six patients treated with CAR T cells following preconditioning cyclophosphamide who subsequently received checkpoint inhibitors, one showed a complete metabolic response (CMR), two had a partial response (PR) and one exhibited stable disease (SD). Mesothelin-targeted CAR T immunotherapy and PD-1 checkpoint inhibition was well-tolerated with no adverse events greater than Grade 2 and no on-target, off-tumor toxicity.

Financial terms of the agreement were not disclosed.

References

[1]Cherkassky L, *et al.* Human CAR T cells with cell-intrinsic PD-1 checkpoint blockade resist tumor-mediated inhibition. *J Clin Invest.* 2016 Aug 1;126(8):3130-44. doi: 10.1172/JCI83092. Epub 2016 Jul 25.

[2]Adusumilli PS, *et al.* A phase I clinical trial of malignant pleural disease treated with regionally delivered autologous mesothelin-targeted CART cells: safety and efficacy - a preliminary report. Abstract 342; 2018 ASGCT Annual Meeting; Chicago, IL; May 16-19, 2018.

[3]Adusumilli PS, *et al.* Regional delivery of mesothelin-targeted CAR T cell therapy generates potent and long-lasting CD4-dependent tumor immunity. *Sci Transl Med.* 2014 Nov 5;6(261):261ra151. doi: 10.1126/scitranslmed.3010162.

About Atara Biotherapeutics, Inc.

Atara Biotherapeutics, Inc. (@Atarabio) is a leading off-the-shelf, allogeneic T-cell immunotherapy company developing novel treatments for patients with cancer, autoimmune

and viral diseases. Atara's most advanced T-cell immunotherapy, tab-cel® (tabelecleucel), is in Phase 3 development for patients with Epstein-Barr virus associated post-transplant lymphoproliferative disorder (EBV+ PTLD), as well as other EBV-associated hematological malignancies and solid tumors, including nasopharyngeal carcinoma (NPC). Atara is also developing T-cell immunotherapies targeting EBV antigens believed to be important for the potential treatment of multiple sclerosis (MS). Atara's pipeline also includes next-generation chimeric antigen receptor T-cell (CAR T) immunotherapies for patients with hematological malignancies and solid tumors, autoimmune and infectious diseases. The company was founded in 2012 and is headquartered in South San Francisco, California.

Forward-Looking Statements
This press release contains or may imply "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. For example, forward-looking statements include statements regarding: which of Atara's CAR T programs with MSK is the most advanced; the ability to develop a next-generation, mesothelin-targeted CAR T; the status of mesothelin as a promising target for a CAR T incorporating MSK's PD-1 DNR technology; the ability of PD-1 DNRs to enhance CAR T efficacy in solid tumors; the ability of MSK's mesothelin 1XX CAR T co-stimulatory domain to extend functional CAR T cell persistence; Atara's ability to advance programs with near-term clinical potential; Atara's ability to progress a mesothelin-targeted CAR T or other CAR T immunotherapies in oncology. Because such statements deal with future events and are based on Atara Biotherapeutics' current expectations, they are subject to various risks and uncertainties and actual results, performance or achievements of Atara Biotherapeutics could differ materially from those described in or implied by the statements in this press release. These forward-looking statements are subject to risks and uncertainties, including those discussed in Atara Biotherapeutics' filings with the Securities and Exchange Commission (SEC), including in the "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" sections of the Company's most recently filed periodic reports on Form 10-K and Form 10-Q and subsequent filings and in the documents incorporated by reference therein. Except as otherwise required by law, Atara Biotherapeutics disclaims any intention or obligation to update or revise any forward-looking statements, which speak only as of the date hereof, whether as a result of new information, future events or circumstances or otherwise.

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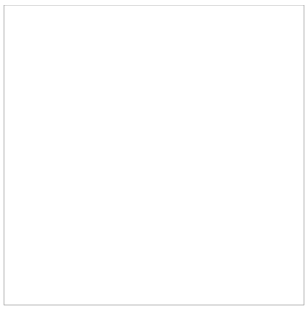

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