Atara Biotherapeutics Announces Publication of Phase 1 Study Demonstrating Clinical Improvement in Progressive Multiple Sclerosis Patients Treated with ATA190, an Autologous Epstein-Barr Virus (EBV)-Specific T-Cell Immunotherapy

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Findings reported in an article online and to be published in the December 2018 issue of the JCI Insight

SOUTH SAN FRANCISCO, Calif., Nov. 19, 2018 (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 results of a Phase 1 clinical study conducted by the Company's collaborating investigators at QIMR Berghofer Medical Research Institute and The University of Queensland were published online in *JCI Insight*. The article describes clinical findings observed in progressive multiple sclerosis (MS) patients treated with ATA190, Atara's autologous EBV-specific T-cell immunotherapy.

"We previously presented promising initial ATA190 results in patients with progressive MS, and the published results confirm our earlier observations," said Professors Michael Pender, The University of Queensland and Rajiv Khanna, Coordinator of QIMR Berghofer Centre for Immunotherapy and Vaccine Development. "Findings from the study support growing evidence that targeting EBV-positive B cells is a potential novel treatment modality for MS and merit additional investigation."

The Phase 1 open-label, uncontrolled study evaluated escalating doses of ATA190 in ten patients, five with primary and five with secondary progressive MS. Safety and efficacy were monitored for up to 27 weeks and included Expanded Disability Status Scale (EDSS) score, fatigue, cognitive and other neurological assessments as well as analysis of magnetic resonance imaging (MRI) and cerebrospinal fluid (CSF) immunoglobulin G (IgG) production. Prior to ATA190 T-cell immunotherapy, patients had experienced progressive neurological deterioration for a mean of 10.1 years.

ATA190 was well-tolerated and no severe adverse events were observed in the study. Adverse events of grade 1 or 2 severity occurred in 2 participants, with only one grade 1 dysgeusia definitely related to treatment. Seven patients in the study showed symptomatic and objective neurological improvement, which commenced two to 14 weeks after the first infusion. Reduction in fatigue, one of the most frequent and disabling symptoms of MS, was a consistent and prominent feature in patients showing neurological improvement.

Reactivity of ATA190 against target EBV antigens (EBV reactivity) as well as other mechanistic markers of T cell function were assessed. Six participants in the study who received ATA190 with strong EBV reactivity experienced clinical improvement, including three with decreased EDSS scores. One of four participants who received ATA190 with weak EBV reactivity showed improvement and no change in EDSS score was observed. One of ten patients had neurological deterioration during the study.

"We are encouraged by the published results for autologous ATA190, the first prospective clinical study of an EBV-specific T-cell immunotherapy in progressive MS," said Dietmar Berger, M.D., Ph.D., Global Head of Research and Development of Atara Biotherapeutics. "We are also advancing an ongoing Phase 1 off-the-shelf, allogeneic ATA188 study in patients with progressive MS across clinical sites in the U.S. and Australia. We look forward to continued development of both programs, including our plans to initiate a randomized ATA190 MS study."

The study was funded by MS Queensland, MS Research Australia, Perpetual Trustee Company Ltd and donations from private individuals.

About Progressive Multiple Sclerosis

MS is a chronic neurological autoimmune disease that affects more than two million people around the world. Progressive MS (PMS) is a severe form of the disease with few therapeutic options. PMS comprises two conditions, both characterized by persistent progression and worsening of MS symptoms and physical disability over time. Primary Progressive MS (PPMS) occurs when continuous progressive disease is present at diagnosis and occurs in approximately 15% of newly diagnosed cases. Secondary Progressive MS (SPMS) initially begins as RRMS and develops into a progressive form. Up to 80% of people with RRMS will eventually develop SPMS. There is substantial unmet medical need for new and effective therapies for patients with PPMS and SPMS. Most treatment options that work well in reducing flares in RRMS have not been shown to be effective in slowing or reversing disability in PMS.

About off-the-shelf, allogeneic ATA188 and autologous ATA190

Epstein-Barr Virus (EBV) is associated with a wide range of hematologic malignancies and solid tumors, as well as certain autoimmune conditions such as multiple sclerosis (MS). T cells are a critical component of the body's immune system and can selectively target specific EBV antigens believed to be important for the potential treatment of MS. Off-the-shelf, allogeneic ATA188 and autologous ATA190, using Atara's complementary T-cell immunotherapy technology pioneered by Professor Rajiv Khanna at QIMR Berghofer, have the potential to precisely recognize and eliminate EBV-infected B cells in the central nervous system that may catalyze autoimmune responses and MS pathophysiology. In 2017 Professor Michael Pender from The University of Queensland presented results from the first autologous ATA190 study, which was funded by MS Research Australia, MS Queensland, Perpetual Trustee Company Ltd and donations from private individuals. Atara is advancing an ongoing Phase 1 off-the-shelf, allogeneic ATA188 study in patients with progressive MS across clinical sites in the U.S. and Australia and plans to initiate a randomized autologous ATA190 study in progressive MS patients.

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 hematologic

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 hematologic 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: the timing, progress and results of the Company's Phase 1 studies of ATA188 and ATA190 in patients with progressive MS; the potential advantages of ATA188 and ATA190 in the treatment of progressive MS; the Company's ability to expand its pipeline; and the potential advantages of its other product candidates. 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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