aTyr Pharma Announces Publication of Two Abstracts in American Journal of Respiratory and Critical Care Medicine

May 5, 2020

Abstracts originally accepted for presentation at the 2020 American Thoracic Society (ATS) International Conference

Findings confirm that aTyr's lead clinical candidate, ATYR1923, selectively binds to Neuropilin-2 (NRP2), a unique target expressed on key immune cells in inflammatory conditions

SAN DIEGO, May 05, 2020 (GLOBE NEWSWIRE) -- aTyr Pharma, Inc. (Nasdaq: LIFE), a biotherapeutics company engaged in the discovery and development of innovative medicines based on novel immunological pathways, today announced that two abstracts originally accepted for presentation at the 2020 ATS International Conference will be published in the ATS journal, *American Journal of Respiratory and Critical Care Medicine.* One abstract characterizes the molecular basis for ATYR1923's immunomodulatory properties, including its ability to specifically and selectively bind to NRP2, a target that has been implicated in a broad range of immune-mediated diseases. The second abstract demonstrates that NRP2 is expressed on key immune cells in inflammatory conditions, including sarcoidosis granulomas, reinforcing its status as a key target in the treatment of immune-mediated diseases.

"We are very pleased to have these abstracts, which were originally accepted for presentation at the ATS International Conference, published in the highly-regarded *American Journal of Respiratory and Critical Care Medicine*," stated Dr. Sanjay Shukla, M.D., M.S., President and Chief Executive Officer of aTyr. "The findings summarized in these abstracts confirm the significant role of NRP2 in serious inflammatory diseases, and further elucidate the mechanism of action of ATYR1923 in its ability to selectively bind to this unique target. We look forward to final results from our ongoing Phase 1b/2a clinical trial of ATYR1923 in patients with pulmonary sarcoidosis while in parallel leveraging our numerous research collaborations with biopharmaceutical leaders and academia to further expand our pre-clinical pipeline."

Details of the abstracts are as follows:

P1173 - ATYR1923 Specifically Binds to Neuropilin-2, a Novel Therapeutic Target for the Treatment of Immune-Mediated Diseases
Neuropilin-2 (NRP2) is a pleiotropic cell surface receptor known to be expressed on a number of different immune cell types that plays a key role in regulating inflammatory responses. aTyr Pharma's lead clinical candidate, ATYR1923, is a fusion protein combining a novel immunomodulatory domain from histidyl-tRNA synthetase (HARS) and a human IgG1 Fc. ATYR1923 has previously demonstrated potent immunomodulatory activity *in vitro* and *in vivo*. ATYR1923 specifically and selectively binds to NRP2 on the cell surface, which was discovered by cell microarray screening and confirmed by surface plasmon resonance (SPR) and also by flow cytometry analysis of HEK293 cells over-expressing NRP2. Furthermore, ATYR1923 was also found to bind to cells that endogenously express NRP2 on the surface (such as THP-1 polarized M1 macrophages). These findings indicate that modulation of the NRP2 signaling pathway could be a novel therapeutic approach to immune-mediated diseases. ATYR1923 is currently being evaluated in a Phase 1b/2a study in patients with pulmonary sarcoidosis, an inflammatory disease which can result in lung fibrosis.

P983 - Neuropilin-2, the Specific Binding Partner to ATYR1923, Is Expressed in Sarcoid Granulomas and Key Immune Cells
aTyr reports for the first time that NRP2 is expressed in samples obtained from lung and skin of sarcoidosis patients. More specifically, NRP2 expression was readily detectable within the granulomas in both skin and lung samples. In this abstract, the company demonstrates that NRP2 expression can be detected on key immune cells known to play an important role in inflammation and granuloma formation. These findings highlight the potential of ATYR1923 to exert its effect on various immune cells directly related to the pathology of the target patient population.

About ATYR1923

aTyr is developing ATYR1923 as a potential therapeutic for patients with interstitial lung diseases. ATYR1923, a fusion protein comprised of the immuno-modulatory domain of histidyl tRNA synthetase fused to the FC region of a human antibody, is a selective modulator of neuropilin-2 that downregulates the innate and adaptive immune response in inflammatory disease states. aTyr is currently enrolling a proof-of-concept Phase 1b/2a trial evaluating ATYR1923 in patients with pulmonary sarcoidosis. This Phase 1b/2a study is a multi-ascending dose, placebo-controlled, first-in-patient study of ATYR1923 that has been designed to evaluate the safety, tolerability, steroid sparing effect, immunogenicity and pharmacokinetics profile of multiple doses of ATYR1923.

About NRP2

Neuropilin-2 (NRP2) is a cell surface receptor that plays a key role in lymphatic development and in regulating inflammatory responses. In many forms of cancer, high NRP2 expression is associated with worse outcomes. NRP2 can interact with multiple ligands and co-receptors through distinct domains to influence their functional roles, making it a potential drug target with multiple distinct therapeutic applications. NRP2 interacts with type 3 semaphorins and plexins to impact inflammation and with forms of vascular endothelial growth factor (VEGF) and their receptors, to impact lymphangiogenesis. In addition, NPR2 modulates interactions between CCL21 and CCR7 potentially impacting homing of dendritic cells to lymphoid organs. aTyr is currently investigating NRP2 receptor biology, both internally and in collaboration with key academic thought leaders, as a novel target for new product candidates for a variety of diseases, including cancer and inflammation.

About aTyr

aTyr is a biotherapeutics company engaged in the discovery and development of innovative medicines based on novel immunological pathways. aTyr's research and development efforts are concentrated on a newly discovered area of biology, the extracellular functionality and signaling pathways of tRNA synthetases. aTyr has built a global intellectual property estate directed to a potential pipeline of protein compositions derived from 20 tRNA

synthetase genes and their extracellular targets. aTyr's primary focus is ATYR1923, a clinical-stage product candidate which binds to the neuropilin-2 receptor and is designed to down-regulate immune engagement in interstitial lung diseases. For more information, please visit http://www.atyrpharma.com.

Forward-Looking Statements

This press release contains forward-looking statements within the meaning of the Private Litigation Reform Act. Forward-looking statements are usually identified by the use of words such as "anticipates," "believes," "estimates," "expects," "intends," "may," "plans," "projects," "seeks," "should," "will," and variations of such words or similar expressions. We intend these forward-looking statements to be covered by such safe harbor provisions for forward-looking statements and are making this statement for purposes of complying with those safe harbor provisions. These forward-looking statements, include statements regarding the potential therapeutic benefits and applications of our product candidates; our ability to successfully advance our product candidates, undertake certain development activities (such as the initiation of clinical trials, clinical trial enrollment, the conduct of clinical trials and the announcement of top-line results) and accomplish certain development goals, and the timing of such events; and the scope and strength of our intellectual property portfolio. These forward-looking statements also reflect our current views about our plans, intentions, expectations, strategies and prospects, which are based on the information currently available to us and on assumptions we have made. Although we believe that our plans, intentions, expectations, strategies and prospects, as reflected in or suggested by these forward-looking statements, are reasonable, we can give no assurance that the plans, intentions, expectations or strategies will be attained or achieved. All forward-looking statements are based on estimates and assumptions by our management that, although we believe to be reasonable, are inherently uncertain. Furthermore, actual results may differ materially from those described in these forward-looking statements and will be affected by a variety of risks and factors that are beyond our control including, without limitation, risks associated with the discovery, development and regulation of our product candidates, the risk that we may cease or delay preclinical or clinical development activities for any of our existing or future product candidates for a variety of reasons (including difficulties or delays in patient enrollment in planned clinical trials), the possibility of unexpected expenses or other demands on our cash resources, and the risk that we may not be able to raise the additional funding required for our business and product development plans, as well as those risks set forth in our most recent Annual Report on Form 10-K, Quarterly Reports on Form 10-Q and in our other SEC filings. Except as required by law, we assume no obligation to update publicly any forward-looking statements, whether as a result of new information, future events or otherwise.

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