



NEWS RELEASE

Inovio's Cancer Immunotherapy (INO-5150) Slowed PSA Rise and Significantly Increased PSA Doubling Times In Patients with Recurrent Prostate Cancer

2017-09-11

INO-5150 generated antigen specific T cell immune responses in a phase 1b clinical study

PLYMOUTH MEETING, Pa., Sept. 11, 2017 (GLOBE NEWSWIRE) -- Inovio Pharmaceuticals, Inc. (NASDAQ:INO), today announced that an interim data analysis showed that its INO-5150 cancer immunotherapy product generated antigen-specific CD8+ killer T cell responses measured in peripheral blood from subjects with biochemically recurrent prostate cancer. The immunology results demonstrate that INO-5150 treatment as a monotherapy generated prostate specific antigen (PSA) and prostate specific membrane antigen (PSMA) specific T cell responses in peripheral blood in 60% (35/58) of the subjects. Moreover, patients with specific CD8+ T cell responses experienced dampening in the rise of PSA and significant increases in PSA Doubling Times (PSADT). PSA is a prostate cancer associated biomarker and positive changes on PSA levels could signal INO-5150's potential positive impact on the treatment of prostate cancer.

These results were presented as a poster discussion on September 10th at the 2017 European Society of Medical Oncology (ESMO) meeting in Madrid, Spain.

Dr. Neil Shore, MD, Medical Oncologist at Urologic Associates of North Carolina, and the principal investigator of this study said, "Immunotherapy is an exciting new approach being evaluated for the treatment of many cancers including prostate cancer, where a small subset of patients have been shown to demonstrate clinical benefit from such therapy in the form of checkpoint inhibitors. Our study provides encouraging immunologic and clinical data that Inovio's immunotherapy product can generate antigen-specific CD8+ killer T cell responses in the blood and link such responses to PSA changes in prostate cancer patients. Our results suggest that further evaluation of this product in prostate cancer patients should be explored."

Dr. J. Joseph Kim, Inovio's President and CEO, said, "As a leader in active immunotherapy for cancer with its lead program in phase 3, Inovio is pleased to report on promising phase 1b clinical trial data of our prostate cancer therapy INO-5150. The immunotherapy's ability to generate anti-prostate cancer CD8+ T cell responses in patients dosed is truly exciting. Perhaps even more importantly, we also observed that the treated patients with better T cell responses saw a slower rise of PSA levels compared to those without the T

cell responses.

We believe the new clinical data positions INO-5150 as an attractive T cell generating immunotherapy component of a potential combination regimen. In this regard, Inovio already has one the most extensive and dynamic T cell immunotherapy combo portfolio in our field, with three different PD-1/PDL-1 immuno-oncology combo efficacy studies with 3 different collaborators – MedImmune, Regeneron, and Genentech for MEDI0457 and INO-5401."

INO-5150, an active immunotherapy targeting both PSA and PSMA antigens which are present in the majority of prostate cancer cells, is administered with and without INO-9012, Inovio's DNA-based IL-12 immune activator. INO-5150 is designed to activate patients' immune responses and to specifically target prostate cancers expressing PSA and PSMA. This open label phase 1b study has fully enrolled 62 subjects with biochemically recurrent (rising PSA) prostate cancer and is intended to assess the safety, tolerability, dosing and immunogenicity of INO-5150 alone or in combination with INO-9012. This multi-centered study is also evaluating changes in PSA levels and kinetics, as PSA is an important biomarker in prostate cancer.

INO-5150 was generated using Inovio's proprietary technology process to enable significant production of PSA and PSMA antigens with genetic sequences differentiated from native human PSA and PSMA sequences. This patented approach is designed to help the body's immune system overcome its "self-tolerance" to prostate cancer cells and mount a strong targeted CD8+ killer T cell response to eliminate the cancerous cells displaying these antigens. PSMA is also one of 3 antigens comprising INO-5401, which is being tested as an immunotherapy to treat glioblastoma multiforme and metastatic bladder cancer in combination with Regeneron and Genentech's checkpoint inhibitors, respectively.

This poster presentation provided immune response and clinical correlation across all four cohorts. In addition to immune responses, clinical correlative analyses evaluating PSA kinetics showed that patients with specific CD8+ T cell responses experienced dampening in the rise of PSA and significant increases in PSADT. Additional prostate cancer tissue analyses are ongoing to further investigate immunological correlation.

About Prostate Cancer and Biochemically Recurrent Prostate Cancer (BRPC)

Prostate cancer is the second most frequently diagnosed cancer in men. Nearly three-quarters of the registered cases occur in developed countries. Accounting for nearly 300,000 deaths each year, prostate cancer is the sixth leading cause of death from cancer in men. There are about 60,000 patients each year in the US that develop biochemically recurrent prostate cancer (BRPC). The development of a new treatment for prostate cancer would be a significant medical advance given that current standard-of-care treatment options (surgery, radiation and hormone deprivation), while somewhat effective, all carry deleterious side effects and are often not a long-term cure.

About Inovio Pharmaceuticals, Inc.

Inovio is taking immunotherapy to the next level in the fight against cancer and infectious diseases. We are the only immunotherapy company that has reported generating T cells in vivo in high quantity that are fully functional and whose killing capacity correlates with relevant clinical outcomes with a favorable safety profile. With an expanding portfolio of immune therapies, the company is advancing a growing preclinical and clinical stage product pipeline. Partners and collaborators include MedImmune, Regeneron, Genentech, The Wistar Institute, University of Pennsylvania, DARPA, GeneOne Life Science, Plumblin Life Sciences, ApolloBio Corporation, Drexel University, NIH, HIV Vaccines Trial Network, National Cancer Institute, U.S. Military HIV Research Program, and Laval University. For more information, visit www.inovio.com.

This press release contains certain forward-looking statements relating to our business, including our plans to develop electroporation-based drug and gene delivery technologies and DNA vaccines, our expectations regarding our research and development programs, including the planned initiation and conduct of clinical trials and the availability and timing of data from those trials, and the sufficiency of our capital resources. Actual events or results may differ from the expectations set forth herein as a result of a number of factors, including uncertainties inherent in pre-clinical studies, clinical trials and product development programs, the development of INO-5150, and, INO-9012, the availability of funding to support continuing research and studies in an effort to prove safety and efficacy of electroporation technology as a delivery mechanism or develop viable DNA vaccines, our ability to support our pipeline of SynCon® active immunotherapy and vaccine products, the ability of our collaborators to contribute expected resources and products, and certain collaborators to attain development and commercial milestones for products we license and product sales that will enable us to receive future payments and royalties, the adequacy of our capital resources, the availability or potential availability of alternative therapies or treatments for the conditions targeted by the company or its collaborators, including alternatives that may be more efficacious or cost effective than any therapy or treatment that the company and its collaborators hope to develop, issues involving product liability, issues involving patents and whether they or licenses to them will provide the company with meaningful protection from others using the covered technologies, whether such proprietary rights are enforceable or defensible or infringe or allegedly infringe on rights of others or can withstand claims of invalidity and whether the company can finance or devote other significant resources that may be necessary to prosecute, protect or defend them, the level of corporate expenditures, assessments of the company's technology by potential corporate or other partners or collaborators, capital market conditions, the impact of government healthcare proposals and other factors set forth in our Annual Report on Form 10-K for the year ended December 31, 2016, our Form 10-Q for the period ended June 30, 2017, and other regulatory filings we make from time to time. There can be no assurance that any product candidate in Inovio's pipeline will be successfully developed, manufactured or commercialized, that final results of clinical trials will be supportive of regulatory approvals required to market licensed products, or that any of the forward-looking information provided herein will be proven accurate. Forward-looking statements speak only as of the date of this release, and Inovio undertakes no obligation to update or revise these statements, except as may be required by law.

In addition, the forward-looking statements included in this press release represent Inovio's views as of the date hereof. Inovio anticipates that subsequent events and developments may cause its views to change. However, while Inovio may elect to update these forward-looking statements at some point in the future, the company specifically disclaims any obligation to do so, except as

may be required by law. These forward-looking statements should not be relied upon as representing Inovio's views as of any date subsequent to the date of this release.

CONTACTS:

Investors/Media: Jeff Richardson, Inovio Pharmaceuticals, 267-440-4211, **jrichardson@inovio.com**

Source: Inovio Pharmaceuticals