



NEWS RELEASE

Inovio Pharmaceuticals Presents Immuno-Oncology Advancements At Society for Immunotherapy of Cancer Conference

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Inovio's cancer immunotherapies show antigen-specific T-cell stimulation in head and neck and other solid tumors

PLYMOUTH MEETING, Pa., Nov. 10, 2017 (GLOBE NEWSWIRE) -- Inovio Pharmaceuticals, Inc. (NASDAQ:INO) today announced that two of its cancer immunotherapies demonstrated antigen-specific T-cell stimulation in phase 1 studies. INO-3112 (now called MEDI0457), an investigational T-cell activation immunotherapy that targets cancers caused by human papillomavirus (HPV) types 16 and 18 and licensed to MedImmune, the global Research and Development arm of AstraZeneca, also led to a head and neck cancer patient's complete response when matched with a PD-1 checkpoint inhibitor. In addition, INO-1400, Inovio's investigational cancer immunotherapy targeting hTERT, which is over-expressed in a majority of cancers, generated hTERT-specific IFN- γ secreting T cells, suggesting an ability to break immune tolerance. These results were revealed at poster presentations at the Society for Immunotherapy of Cancer (SITC) 32nd Annual Meeting starting today at National Harbor, Md.

Dr. J. Joseph Kim, Inovio's President and CEO, said, "This study of MEDI0457 shows efficacy signals that Inovio's activation immunotherapy coupled with checkpoint inhibitor could have meaningful therapeutic impact, given an unusual complete response in one patient. Separately, we are evaluating our hTERT therapy, INO-1400, in nine different solid tumors including breast, lung and pancreatic cancers in a clinical study. Any success we see in our hTERT therapy gives us added confidence in our recently initiated efficacy studies combining PD-1/PD-L1 inhibitors and INO-5401, which includes three of Inovio's top SynCon® cancer antigens – hTERT, WT1, and PSMA, which are over-expressed in multiple tumor types. We look forward to sharing further data on our immunotherapies as studies progress."

In a phase 1 study of MEDI0457 in 22 HPV-positive patients with squamous cell carcinoma of the head and neck, Inovio has previously demonstrated that this cancer immunotherapy generated robust antigen-specific CD8+ killer T cell responses in both tumor tissue and peripheral blood. One patient which initially displayed a slight increase in T cell immune responses developed progressive disease at 11 months into the study and received nivolumab, a PD-1 checkpoint inhibitor. Subsequently, the patient had a sustained complete response after only four doses, and continues on therapy with no evidence of disease, 16 months after

initiation of nivolumab.

Detailed immune analyses found that MEDI0457 had activated HPV16-specific CD8+ T cells in the patient and the subsequent treatment with nivolumab helped to unleash the expansion of these killer T cells, which is contributing to the sustained complete response observed in this patient. Medimmune is conducting a separate phase 1/2 trial combining its PD-L1 inhibitor (durvalumab) with MEDI0457 in HPV-associated head and neck cancer patients to evaluate the clinical efficacy of the combination treatment.

Dr. Charu Aggarwal, MD, MPH, medical oncologist and assistant professor of medicine at the hospital of the University of Pennsylvania and the principal investigator of this study, said "This observation suggests that treatment with MEDI0457 prior to PD-1 inhibition can be synergistic, and increase efficacy of checkpoint inhibitors."

In Inovio's phase 1 dose-escalation study of its synthetic optimized DNA plasmids that target hTERT, the immunotherapies were administered via Inovio's CELLECTRA® delivery device to assess the safety, tolerability, and immune effects of INO-1400 or INO-1401 (two different versions of HTERT constructs), alone or co-administered with a plasmid encoding for IL-12 (INO-9012), in 90 patients with 9 different solid tumors. Interim results presented at the conference show positive safety and tolerability data as well as the generation of hTERT-specific IFN-γ secreting T cells, suggestive of an ability to break immune tolerance.

Dr. Robert Vonderheide, MD, DPhil, Director of the Abramson Cancer Center of the University of Pennsylvania and a principal investigator for the study, said: "If successful, this vaccine platform could represent not only a novel type of immune therapy for cancer patients, but also one day offer an opportunity for immune prevention of cancer."

High levels of human telomerase reverse transcriptase (hTERT) have been reported in many tumor types such as breast, lung, and pancreas. Inovio's hTERT therapy may prove to be a promising immuno-oncology target for the treatment of these cancers. In 2017, over 530,000 new cases of breast, lung, or pancreatic cancers were reported in the United States and over 240,000 people died from these cancers. Despite available treatments, mortality rates remain unacceptably high in these tumor types. In addition, many existing treatment modalities are associated with significant adverse events.

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 immunotherapies, the company is advancing a growing preclinical and clinical stage product pipeline. Partners and collaborators include or have included MedImmune, Regeneron, Genentech, The Wistar Institute, University of Pennsylvania, DARPA, GeneOne Life Science, Plumblin Life Sciences, ApolloBio Corporation, Drexel University, National Microbiology Laboratory of the Public Health Agency of Canada, NIH, HIV Vaccines Trial Network, NIAID, U.S. Army Medical Research Institute of Infectious Diseases and U.S. Military HIV Research Program. 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 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 including INO-1400 and INO-9012, our ability to support our pipeline of SynCon® active immunotherapy and vaccine products, the ability of our 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 September 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. 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.

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