



NEWS RELEASE

Inovio Pharmaceuticals SynCon® TERT Cancer Immunotherapy Combined with Checkpoint Inhibitor Synergistically Shrinks Tumor and Improves Survival in Preclinical Tumor Model

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PLYMOUTH MEETING, Pa., Nov. 27, 2017 (GLOBE NEWSWIRE) -- Inovio Pharmaceuticals, Inc. (NASDAQ:INO) demonstrated the synergistic effect of combining Inovio's TERT (telomerase reverse transcriptase) cancer immunotherapy in combination with a checkpoint inhibitor in preclinical tumor model. The combination therapies resulted in robust anti-tumor effects and showed significant improvement in survival compared to either therapy alone. Preclinical TERT study results were detailed in a paper published in the most recent edition of Molecular Therapy entitled, "Synergy of Immune Checkpoint Blockade with a Novel Synthetic Consensus DNA Vaccine Targeting TERT," by Inovio and its collaborators at the Wistar Institute.

Dr. J. Joseph Kim, President and CEO, said, "The synergistic anti-tumor effect observed in this published preclinical study provides Inovio with added confidence in the company's recently initiated efficacy studies combining checkpoint inhibitors and INO-5401, Inovio's cancer immunotherapy which includes three of Inovio's top SynCon® cancer antigens – hTERT, WT1, and PSMA, which are over-expressed in multiple tumor types. MedImmune, Regeneron and Genentech have all turned to Inovio's DNA-based immunotherapy products to evaluate increased response rates in combination with their checkpoint inhibitors. We look forward in sharing combination data from these efficacy trials when they become available."

Inovio is currently evaluating its human TERT (hTERT) immunotherapy, INO-1400, as a mono-therapy, in nine different solid tumors including breast, lung and pancreatic cancers. A recent poster presentation at the SITC annual conference demonstrated that INO-1400 generated hTERT-specific T cell immune responses in patients. Furthermore, hTERT along with WT1 and PSMA antigens also comprise the new multi-antigen immunotherapy INO-5401, which is being evaluated in two separate phase 1/2 efficacy trials in combinations PD-L1 (with Genentech) and PD-1 (with Regeneron) checkpoint inhibitors in metastatic bladder cancer and in newly diagnosed Glioblastoma multiforme (GBM), respectively.

INO-5401 is being tested in combination with PD-1/PD-L1 inhibitors to bring about better anti-tumor effects in metastatic bladder

and GBM. Nearly 430,000 new cases of urinary bladder cancer are diagnosed each year worldwide; it accounts for about 165,000 deaths worldwide annually. Advanced unresectable or metastatic UC remains a high unmet medical need as survival remains poor for most patients. The approval of several checkpoint inhibitors for advanced unresectable or metastatic UC has improved response and survival rates for some patients, however, the majority (~80%) of patients do not experience meaningful clinical responses to checkpoint inhibitor monotherapy. GBM is the most aggressive brain cancer and its prognosis is extremely poor. The median overall survival for patients receiving standard of care therapy is approximately 15 months and the average five-year survival rate is less than three percent. Clinical responses to checkpoint inhibitors in GBM patients have been poor overall (ORR<10%). Both of these INO-5401 combination studies are designed to test the synergistic anti-tumor effects of the combination therapies.

Significant early checkpoint combination effects were seen in a clinical study of another Inovio T-cell generating product, INO-3112 (licensed to MedImmune and now called MEDI0457). 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 measured in both tumor tissue and peripheral blood. One patient who initially displayed a slight increase in T cell immune responses developed progressive disease at 11 months into the study. The patient subsequently received nivolumab, a PD-1 checkpoint inhibitor and sustained complete response after only four doses of nivolumab. This patient continues on therapy with no evidence of disease, 16 months after initiation of nivolumab. Medimmune is currently conducting a separate phase 1/2 efficacy trial combining its PD-L1 inhibitor (durvalumab) with MEDI0457 in 50 metastatic HPV-associated head and neck cancer patients to evaluate the clinical efficacy of the combination treatment. Head and neck cancer caused by HPV is the fastest growing cancer in men today, and the checkpoint inhibitor therapies alone have only been positive in limited percentage (ORR<20%) of treated patients.

This published paper highlights the potential benefits of DNA immunotherapy/immune checkpoint blockade combinations using PD-1 or CTLA4 checkpoint inhibitors in patients that respond poorly to immune checkpoint blockade alone, and allow for better rational design of combination therapies. Furthermore, these results suggest that this synergistic anti-tumor effect is due to the effect of immune checkpoint blockade on expanding effector T cells generated from the TERT therapy in the tumor microenvironment rather than boosting vaccine responses in the periphery.

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 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 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. 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.

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