



NEWS RELEASE

Inovio Reports 2nd Patient Achieving Full Remission from HPV-Related Head & Neck Cancer after Treatment with Synthetic DNA Vaccine and a PD-1 Checkpoint Inhibitor

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PLYMOUTH MEETING, Pa., Jan. 24, 2019 /PRNewswire/ -- Inovio Pharmaceuticals, Inc. (NASDAQ: INO) today announced that a second patient with HPV-related head and neck cancer treated with INO-3112 (now called MEDI0457) in a Phase 1 trial achieved a sustained complete response (full remission) after subsequent treatment with a PD-1 checkpoint inhibitor. This marks the **second patient** with metastatic cancer observed in full remission (complete response) after treatment with synthetic DNA vaccine followed by a PD-1 checkpoint inhibitor.

Dr. J. Joseph Kim, Inovio's President and CEO, said, "Achieving sustained complete responses with immunotherapy in metastatic cancer patients is what you hope for with novel cancer treatments. The fact that the treatment with our synthetic DNA vaccine followed with two different PD-1 inhibitors in this HPV-related cancer patient population showed a complete response in 2 out of 4 progressors is very encouraging as the best complete response rate by PD-1 inhibitors as a monotherapy in metastatic head and neck cancer is approximately 4%. While additional data from Phase 2 clinical studies will provide more insights to the power of synthetic DNA vaccine, this newly reported data provides additional validation for Inovio's overall cancer combination strategy using a T cell activator combined with a checkpoint inhibitor against an array of cancers with big pharma partners providing various checkpoint inhibitors. In addition to our partnership around HPV-related cancers, Inovio is also collaborating with F. Hoffman-La Roche Ltd./Genentech and Regeneron in efficacy trials coupling Inovio's INO-5401 with their checkpoint inhibitors designed to increase response rates in metastatic bladder and GBM, respectively, with interim efficacy data expected later this year."

Both patients who achieved full cancer remission were treated with four doses of synthetic DNA vaccine as part of a Phase 1 monotherapy trial of 22 patients with HPV-related head and neck squamous cell carcinoma in which 91% of patients (20/22) showed T cell activity in the blood or tissue. This demonstrates that synthetic DNA vaccine generated robust HPV16/18 specific CD8+ T cell responses in peripheral blood and increased CD8+ T cell infiltration in resected tumor tissue samples.

Of the four patients who developed progressive disease and were subsequently administered a PD-1 checkpoint inhibitor, two patients rapidly exhibited a complete response. The most recent patient for which data was presented yesterday received

pembrolizumab (KEYTRUDA®); while the previously reported complete responder was treated with nivolumab (OPDIVO®). The patients moved from metastatic head and neck cancer to no evidence of disease and they remain alive two years after treatment. Detailed results of the first patient with head and neck cancer who received nivolumab were published in the October issue of Clinical Cancer Research.

These results were presented on January 23 at the Keystone Symposia Conference/Cancer Vaccines being held in Vancouver, Canada, by David B. Weiner, Ph.D., executive vice president of The Wistar Institute, director of its Vaccine & Immunotherapy Center, and the W.W. Smith Charitable Trust Professor in Cancer Research.

KEYTRUDA® is a registered trademark of Merck & Co. (MRK); OPDIVO® is a registered trademark of Bristol-Myers Squibb Company (BMY).

About HPV-Related Head & Neck Cancer

Human papillomavirus (HPV) is the most common sexually transmitted disease in the United States, currently infecting about 79 million Americans. HPV is known to play a major role in the development of head and neck cancers, which include cancers of the oral cavity, oropharynx, nose/nasal passages and larynx. In 2019 an estimated 53,000 persons will get oral cavity or oropharyngeal cancer in the U.S. New cases of head and neck cancer occur nearly three times more often in men as in women. Incidence rates of head and neck cancers have been on the rise, especially HPV-related oropharyngeal cancer in men, and are expected to continue growing.

About Inovio Pharmaceuticals, Inc.

Inovio is a late-stage biotechnology company focused on the discovery, development, and commercialization of DNA immunotherapies that transform the treatment of cancer and infectious diseases. Inovio's proprietary platform technology applies next-generation antigen sequencing and DNA delivery to activate potent immune responses to targeted diseases. The technology functions exclusively in vivo, and has been demonstrated to consistently activate robust and fully functional T cell and antibody responses against targeted cancers and pathogens. Inovio is the only immunotherapy company that has reported generating T cells whose killing capacity correlates with relevant clinical outcomes. Inovio's most advanced clinical program, VGX-3100, is in Phase 3 for the treatment of HPV-related cervical pre-cancer. Also in development are Phase 2 immuno-oncology programs targeting head and neck cancer, bladder cancer, and glioblastoma, as well as platform development programs in hepatitis B, Zika, Ebola, MERS, and HIV. Partners and collaborators include MedImmune, Regeneron, Roche/Genentech, ApolloBio Corporation, The Bill and Melinda Gates Foundation, The Wistar Institute, the University of Pennsylvania, Parker Institute for Cancer Immunotherapy, CEPI, DARPA, GeneOne Life Science, Plumblin Life Sciences, 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. 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 us or our collaborators, including alternatives that may be more efficacious or cost effective than any therapy or treatment that we and our collaborators hope to develop, issues involving product liability, issues involving patents and whether they or licenses to them will provide us 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 we can finance or devote other significant resources that may be necessary to prosecute, protect or defend them, the level of corporate expenditures, assessments of our 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, 2017, our Quarterly Report on Form 10-Q for the quarter ended September 30, 2018 and other regulatory filings we make from time to time. There can be no assurance that any product candidate in our 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 we undertake no obligation to update or revise these statements, except as may be required by law.

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