NEWS RELEASE

Inovio dMAb™ Constructs Shrink Prostate Tumors and Protect Against Lethal Antibiotic-Resistant Bacterial Infection In Preclinical Studies

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Inovio's DNA-based Monoclonal Antibody ProgramsBoosted by Scientific Publications

PLYMOUTH MEETING, Pa., Sept. 21, 2017 (GLOBE NEWSWIRE) --

Inovio Pharmaceuticals, Inc. (NASDAQ:INO) today announced that the development of its DNA-based monoclonal antibody program received a boost from two peer-reviewed scientific papers that demonstrate their impact on prostate tumors and in preventing infection from a pneumonia-causing bacteria in preclinical studies.

Dr. J. Joseph Kim, Inovio's President and CEO, said, "Many of the top-selling drugs on the market today are monoclonal antibodies; our dMAb products may improve upon this class using our synthetic design and in vivo production. In fact, we are advancing our first dMAb product – our therapeutic Ebola product funded by DARPA – into human testing next year, opening the path for commercializing these new products to treat cancer and infection. These two newly published studies further support that Inovio's potent dMAb platform could be expanded to target cancer and bacterial diseases along with viral infectious diseases. Our dMAb program represents a new application of our potent DNA technology platform to develop valuable new treatments for cancers and infection."

An article in the journal Cancer Immunology, Immunotherapy detailed how the dMAbTM construct against prostate specific membrane antigen (PSMA) produced monoclonal antibodies that shrank prostate tumors in a preclinical animal model. The article is entitled, "Novel cancer immunotherapy with DNA-encoded anti-prostate-specific membrane antigen monoclonal antibody," by Inovio researchers and collaborators.

This research publication is significant because it is the first to report on the use of Inovio dMAb technology to develop novel monoclonal antibody-based therapies against cancer targets. This new dMAb construct utilizes engineered synthetic DNA to encode therapeutic monoclonal antibodies targeted to bind PSMA. When delivered directly into the body, the genetic instructions provided from the dMAb construct enable the patient's own cells to become the factory which manufactures the therapeutic monoclonal

antibody products. The PSMA dMAb antibody was expressed in high levels directly in mice and successfully regressed human prostate cancer cells grown in transgenic mice. Inovio has previously published several papers demonstrating its dMAb product candidate's ability to treat multiple virus targets such as flu, dengue, chikungunya, and HIV.

The anti-cancer dMAb products work by binding the antigens on the cancer cells and killing them by an antibody dependent cytotoxicity (ADCC) mechanism in conjunction with natural killer (NK) cells. These results indicate the potential clinical utility of the dMAb therapeutic strategy against prostate cancer as well as other cancers. The data is especially interesting since the anti-cancer dMAb products utilize an NK cell-killing mechanism which is distinct from the killer T cell mechanisms generated by Inovio's cancer vaccine products like INO-5150 and INO-5401.

In another first, Inovio also published results showing its dMAb constructs targeting antibiotic-resistant bacteria protected mice when challenged with a lethal dose of drug-resistant pseudomonas -- a pneumonia-causing bacteria. Pseudomonas infections usually occur in people in the hospital or with weakened immune systems. The CDC reports each year that more than two million Americans acquire antibiotic-resistant infections that are becoming increasingly more difficult and costly to treat. The bacteria can cause infections of the blood, pneumonia, and infections following surgery that can lead to severe illness and death.

To design an effective treatment, Inovio engineered dMAb constructs encoding two pseudomonas antigens. The constructs were protective against lethal pneumonia, prevented severe lung pathology and even exhibited enhanced protective activity when combined with antibiotics. This paper is also significant for Inovio to demonstrate that dMAb constructs could be successfully designed to generate bispecific monoclonal antibodies. Bispecific monoclonal antibodies are engineered synthetic antibodies which could simultaneously bind two different antigens, and this technique is very difficult to achieve using traditional protein-based monoclonal technology. These results further support the sophisticated capabilities built into Inovio dMAbTM technology. Results from this study were published in Nature Communications, in an article entitled, "DNA-delivery of mono- and engineered bispecific monoclonal antibodies protect against multidrug resistant Pseudomonas aeruginosa," authored by Inovio and its collaborators at The Wistar Institute and MedImmune, AstraZeneca's global biologics research and development arm.

Funded with over $60 million in R&D support from top agencies like DARPA, NIH, and the Gates Foundation, Inovio dMAb products could extend the medical benefits that marketed monoclonal antibodies have already achieved, and even potentially address diseases that conventional monoclonal antibodies cannot. For instance in immuno-oncology, Inovio is already developing PD-1/PD-L1 as well as other checkpoint inhibitors in its cancer dMAb portfolio.

Even though conventional monoclonal antibodies represent one of the most successful segments of the biotechnology market, accounting for over $50 billion in sales today, they are still costly and time consuming to develop, produce and study. They are manufactured outside the body in bioreactors, typically requiring costly large-scale manufacturing facility development and laborious production. Inovio's disruptive dMAb technology has the potential to overcome these limitations by virtue of their simplified design, rapidity of development, product stability, ease of manufacturing and deplorability, and cost effectiveness, thereby providing potential new avenues for treating a range of diseases.

About Inovio's DNA-based Monoclonal Antibody Platform

Funded by over $60 million in R&D support in the last 3 years, Inovio has rapidly advanced this transformative approach in a systemic way. Earlier this year Inovio reported its influenza dMAb produced broadly cross-reactive antibodies that provided complete protection from a lethal challenge with multiple viruses from both influenza A and B types. The flu dMAb paper expanded on similar data from our dMAb products for other viral targets including HIV, dengue, and chikungunya. Together with the two new published studies demonstrating the potential of Inovio dMAb platform to cancer and bacterial diseases, these results fully demonstrate the potential of this platform to target multiple medical markets.

The significant advancement seen in Inovio dMAb technologies is that the optimized genes for a desired monoclonal antibody is encoded in a DNA plasmid, which is produced using very cost effective and highly scalable fermentation techniques. These plasmids are delivered directly into cells of the body using electroporation and the encoded monoclonal antibody is then directly produced by these cells. Previously published studies show that a single administration of a highly optimized DNA-based monoclonal antibody targeting HIV virus produced a high level of expression of the antibody in the bloodstream of mice; Inovio similarly reported data showing that dMAb products against flu, Ebola, chikungunya and dengue protected animals against lethal challenge. Inovio Ebola dMAb™ product is being developed under a grant from the Defense Advanced Research projects Agency (DARPA).

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, Plumbline 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 and dMAbTM products, 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 Inovio dMAb products, 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 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. 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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