Inovio awarded $6.1M sub-grant to develop DNA-based monoclonal antibodies against Zika

Inovio Pharmaceuticals, Inc. {NASDAQ: INO} announced today that it has been awarded a $6.1 million sub-grant through The Wistar Institute to develop a DNA-based monoclonal antibody designed to provide a fast-acting treatment against Zika infection and its debilitating effects.

Inovio Pharmaceuticals Awarded $6.1 Million Sub-grant Through Wistar Institute to Develop DNA-based Monoclonal Antibodies Against Zika Virus

Grant Provides Funding to Help Prepare New Zika Therapy for Human Trials
Inovio Already in Two Human Trials for its Preventive Zika Vaccine.

PLYMOUTH MEETING, Pa. & PHILADELPHIA, Pa. – December 1, 2016 – **Inovio Pharmaceuticals, Inc. {NASDAQ: INO}** announced today that it has been awarded a $6.1 million sub-grant through The Wistar Institute to develop a DNA-based monoclonal antibody designed to provide a fast-acting treatment against Zika infection and its debilitating effects.

The goal of this program, which is funded by a grant to The Wistar Institute from the Bill & Melinda Gates Foundation, is

for the researchers to develop a Zika dMAb® therapy ready for human clinical trials in less than two years.

There is no approved therapeutic or vaccine for Zika infection, presenting a major unmet medical need given that the World Health Organization estimates that more than two billion people are directly at risk for infection. Importantly, infection with the Zika virus during pregnancy can cause a pattern of birth defects including microcephaly.

This new DNA-based monoclonal antibody technology has properties that best fit a response to address a Zika outbreak in that dMAb products can be designed and manufactured expediently on a large scale using common fermentation technology, are thermal-stable, and may be used as a therapy to provide more rapid protection from or limit the spread of Zika infection. Unlike vaccines, monoclonal antibody-based therapies could provide more immediate protection but do not develop long term immune memory. An ideal approach would therefore include the administration of a dMAb product for immediate protection and a DNA vaccine to train the immune system for longer-term, persistent protection against Zika infection. Inovio's optimized DNA-based immunotherapy platform is uniquely positioned to target both immediate therapy through delivery of dMAb products as well as long-term immunity via DNA vaccination.

Dr. J. Joseph Kim, President & CEO of Inovio, said, "*As the leader in DNA-based immunotherapy and vaccine products, with our lead program poised to enter phase III study in the near term, we are also excited to expand our powerful technology platform to develop these new dMAb products. We thank the Gates Foundation for their confidence in the Inovio/Wistar*

team to develop this new type of medicine to address an emerging infectious disease like Zika. This grant marks the fourth major grant in the past couple of years backing the development of Inovio's dMAb technology. Past grants include two from DARPA totaling over $56 million – one for dMAb products for Ebola and one for dMAb products for universal flu and antibiotic resistant bacteria – as well as one from the NIH for dMAb products for treating HIV infection."

Dr. David B. Weiner, Wistar's Executive Vice President, Director of its Vaccine Center, and the W. W. Smith Charitable Trust Endowed Professorship in Cancer Research, is the principal investigator of this grant. Other collaborators on the award include Humabs Biomed and GeneOne Life Sciences. Dr. Weiner said, "*Our team has strong expertise in DNA immunotherapy development, design and delivery technology as well as molecular immunology (The Wistar Institute) and DNA production and clinical studies including device & delivery development (Inovio Pharmaceuticals) and DNA studies in non-human primates. Our collaborative team skillset includes monoclonal antibody discovery (Humabs) and validation, and extensive experience working with in vivo infectious disease models and challenges (Wistar & Humab). Each group will perform experiments and provide essential reagents to other groups within the consortium. The team is experienced with translation from preclinical studies to the clinic.*"

In support of its dMAb technology, the Inovio/Wistar team reported earlier this year that its dMAb product for another emerging infectious disease, Chikungunya (CHKV), provided durable 100% protection in mice. In this study, a single intramuscular injection of a dMAb product protected mice from a lethal dose of the virus. The protection expressed by these dMAb antibodies was very rapid, with 100% survival in mice

challenged with lethal disease as early as two days after dMAb product administration. In comparison, vaccine-driven protection can take weeks to months to reach peak efficacy levels, but provides better long term protection compared to a dMAb product. This published study demonstrates that an Inovio dMAb product and DNA vaccine could be used as an ideal combination to provide both rapid short-term as well as long-term protection. Inovio is the only organization to report such results in any disease using a DNA-based monoclonal antibody, with published preclinical data in dengue and HIV as well, and is also developing dMAb products for treating MERS, influenza, MRSA, RSV, Ebola and cancers.

Inovio is advancing two trials for its DNA-based Zika vaccine. It expects to have preliminary results by year end for its U.S./Canada study. In Puerto Rico, where the CDC estimates Zika will infect more than 25% of the population by year end, Inovio's second study employs a placebo control design that may provide exploratory signals of vaccine efficacy. The company expects to meet with regulators next year to determine the most efficient path forward to develop its Zika vaccine and help mitigate this widespread Zika outbreak that has now expanded into the continental United States.

About Inovio's dMAb Technology

Unlike conventional monoclonal technology, which involves constructing protein-based antibodies and manufacturing them in cell culture in a complex and costly process, Inovio's patent-protected DNA-based monoclonal antibody technology encodes the DNA sequence for a specific monoclonal antibody in a highly optimized plasmid, which would be delivered directly into a subject's arm using electroporation. Cells in the body would then produce the encoded monoclonal antibody molecules,

with intended functional activity including high antigen-binding and neutralization capabilities against the targeted disease. Monoclonal antibodies offer the benefit of inducing a rapid onset of the immune response. Overall, Inovio's dMAb technology may provide clear advantages over conventional monoclonal antibody technology, including faster development, easier product manufacturing, and more favorable pharmacokinetics. The current monoclonal antibody product market is well over $50 billion.

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 pre-clinical and clinical stage product pipeline. Partners and collaborators include MedImmune, The Wistar Institute, University of Pennsylvania, DARPA, GeneOne Life Science, Plumbline Life Sciences, Drexel University, NIH, HIV Vaccines Trial Network, National Cancer Institute, U.S. Military HIV Research Program, and Laval University.

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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 and 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, including the Zika vaccine GLS-5700, 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 broad 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, 2015, our Form 10-Q for the quarter ended September 30, 2016, and other regulatory filings from time to time. There can be no assurance that any product in Inovio's pipeline will be successfully developed or manufactured, that

final results of clinical studies 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.