Inovio Pharmaceuticals announces a collaboration with Wistar for TB and Malaria vaccines

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Inovio and The Wistar Institute Receive More Than $4.6 Million in R&D Funding to Advance Vaccines Against Tuberculosis & Malaria

PLYMOUTH MEETING, Pa. – February 12, 2018 – **Inovio Pharmaceuticals, Inc. {NASDAQ: INO}** today announced that the company is collaborating with The Wistar Institute to advance two novel SynCon® vaccine programs against tuberculosis (TB) and malaria, fully funded by more than $4.6 million in total grants from the Bill & Melinda Gates Foundation and the National Institutes of Health (NIH).

Grants from the Gates Foundation (for malaria) and from the National Institute of Allergy & Infectious Diseases (for TB) will fully support Inovio's efforts to develop new DNA vaccines employing its versatile ASPIRE (Antigen SPecific Immune REsponses) platform that is leading the way forward for activation immunotherapy. This one-of-a-kind platform delivers optimized synthetic antigenic genes into cells, where it is translated into protein antigens that activate an individual's immune system to generate robust targeted T cell and antibody responses.

Malaria and TB remain two of the largest global health problems existing today. Efforts to develop better malaria control tools have gained new urgency as drug resistance has rendered the cheapest and most widely-used anti-malarial drugs useless in many parts of Africa. New combination treatments for malaria are more effective but have remained out of reach for millions of Africans due to supply shortages and the relatively high cost of the drugs. In 2013, there were an estimated 584,000 deaths from malaria with around 90% of these occurring in sub-Saharan Africa, and 83% in children under the age of five in sub-Saharan Africa. There is currently no vaccine on the market for protection against malaria.

Dr. Laurent Humeau, Inovio's Senior VP, Research and Development, said, *"Inovio is pleased to collaborate with The Wistar Institute and laboratory of Inovio's co-founder, Dr. David B. Weiner, to develop novel, effective vaccines against the global health threats of malaria and TB. What we learn from developing vaccines against these infectious disease programs using our versatile ASPIRE™ technology platform we can also apply to advance our cancer-focused therapies. This*

platform is well suited to address global health outbreaks, with its demonstrated potency and long safety track record in the clinic as well as its rapid design, ease of manufacturing and transportation/storage. Based on the quality of preclinical data, Inovio and collaborators plan to obtain additional funding to advance the vaccines into clinical studies."

"*DNA vaccines have a significant public health potential to rapidly impact emerging pandemics, as this technology has conceptual safety, development, speed of production, field stability, and deliverability advantages for vaccine and immunotherapy development," said Dr. David B. Weiner, Ph.D., executive vice president, director of the Vaccine & Immunotherapy Center at The Wistar Institute and the W.W. Smith Charitable Trust Professor in Cancer Research. "These synthetic DNA approaches can be developed for important infectious diseases, and with our collaborators, we have shown this consistently by rapidly engineering multiple synthetic DNA vaccines and advancing them to clinical study with positive outcomes of safety and immune potency."*

Inovio and Wistar will also develop and evaluate a novel SynCon vaccine against TB in non-human primates. This research will be funded under a National Institutes of Health (National Institute of Allergy & Infectious Diseases) grant to Wistar. In use today is a decades-old TB vaccine (BCG) that, while somewhat effective, has variable protective efficacy and is unreliable in protecting against pulmonary TB, which accounts for most of the disease burden worldwide, according to the CDC. A safe, effective and affordable TB vaccine that covers a broad spectrum of strains would represent a major advance in the control of the disease, which is currently experiencing treatment ineffectiveness due to the rise of multi-drug

resistances.

The Inovio/Wistar TB program will also build on recent clinical success by newer genetic immune modulators focused on improved T cell and antibody induction. The program will concentrate on increasing the breadth of coverage induced by optimized SynCon vaccines by exploring the potential of a multivalent DNA vaccine targeting multiple TB antigens at both active and latent stages of infection. Furthermore, Inovio plans to develop this collection of technologies in a simplified vaccine scheme that has distinct clinical advantages for global testing.

Tuberculosis is one of the top ten causes of death worldwide. In 2016, 10.4 million people fell ill with TB, and 1.7 million died from the disease. Over 95% of TB deaths occur in low- and middle-income countries. Seven countries account for 64% of the total, with India leading the count, followed by Indonesia, China, Philippines, Pakistan, Nigeria, and South Africa. In 2016, an estimated one million children became ill with TB and 250,000 children died of TB (including children with HIV-associated TB). TB is also the leading killer of HIV-positive people: in 2016, 40% of HIV deaths were due to TB.

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, the Parker Institute for Cancer Immunotherapy, 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, please visit www.inovio.com

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