

Inovio Deploys DNA-based Monoclonal Antibody Technology in Quest to Cure HIV

Inovio Pharmaceuticals, Incorporated {NASDAQ: INO} today announced that its novel DNA-based monoclonal antibody technology will be deployed to develop products which could be used alone and in combination with other immunotherapies in the pursuit of new ways to treat and potentially cure infection from the HIV virus.

Funding for Potential Breakthrough Therapy is Part of Prestigious NIH/Delany Grant for Industry-Academic Collaboration.

PLYMOUTH MEETING, PA – July 14, 2016 – **Inovio Pharmaceuticals, Incorporated {NASDAQ: INO}** today announced that its novel DNA-based monoclonal antibody technology will be deployed to develop products which could be used alone and in combination with other immunotherapies in the pursuit of new ways to treat and potentially cure infection from the HIV virus.

In a recently published article, Inovio demonstrated that a single administration in mice of a highly optimized dMAb® DNA, which targets HIV, generated antibody molecules in the bloodstream that possessed desirable functional activity including high antigen-binding and HIV-neutralization capabilities against diverse strains of HIV viruses.

Funding for Inovio's effort to treat and potentially cure HIV is part of a \$23 million grant from the National Institutes of Health to The Wistar Institute, an Inovio collaborator.

This grant brings together Inovio and more than 30 of the nation's leading HIV investigators to work on finding a cure for the virus. The grant, called BEAT-HIV: Delaney Collaboratory to Cure HIV-1 Infection by Combination Immunotherapy, is one of six awarded by the NIH as part of the Martin Delaney Collaboratories for HIV Cure Research.

"A simple, safe and scalable cure for HIV would accelerate progress toward ending the HIV/AIDS pandemic," said National Institute of Allergy and Infectious Disease (NIAID) Director Anthony S. Fauci, M.D. *"Through the leadership of talented investigators with a diversity of expertise, the Martin Delaney Collaboratory program will accelerate progress in this key research endeavour."*

Dr. J. Joseph Kim, Inovio's President & CEO, said, *"With 37 million people infected with HIV still awaiting a cure, we are pleased that our new HIV dMAb products are expanding our initiative alongside our breakthrough DNA vaccine products to potentially help these patients."*

Inovio has demonstrated experience in advancing HIV product candidates. Inovio completed initial clinical studies of its HIV immunotherapy PENNVAX®-B, targeting clade B viruses, to achieve proof of principle in generating potent immune responses using its SynCon® immunotherapy technology. In two published phase I studies, PENNVAX-B immunization generated

high levels of activated, antigen-specific CD8+ killer T cells with proper functional characteristics. This ability uniquely positioned PENNVAX as an important vaccine candidate to prevent and treat HIV infections.

Using a \$25 million grant from the NIAID, Inovio designed its universal, multi-antigen PENNVAX-GP vaccine targeting the env, gag and pol antigens to provide global coverage against all major HIV-1 clades. PENNVAX-GP is Inovio's lead preventive and therapeutic immunotherapy for HIV and is being evaluated in a phase I clinical study (HVTN-098) involving 94 healthy subjects as a preventive vaccine.

About Inovio's dMAbs

Monoclonal antibodies (mAb) were a transformational scientific innovation designed to enhance the immune system's ability to regulate cell functions. They are designed to bind to a very specific epitope (area) of an antigen or cell surface target and can bind to almost any selected target.

The paradigm shift of Inovio's technology is that the DNA for a monoclonal antibody is encoded in a DNA plasmid, delivered directly into cells of the body using electroporation, and the mAbs are "manufactured" by these cells. Using this newly patented approach, Inovio published that a single administration of a highly optimized DNA-based monoclonal antibody targeting HIV virus in mice generated antibody molecules in the bloodstream possessing desirable functional activity including high antigen-binding and HIV-neutralization capabilities against diverse strains of HIV viruses. The potential of this technology was further demonstrated in two additional published studies where dMAb products for

Chikungunya and dengue viruses were able to completely protect the treated mice from lethal exposure to these viruses.

All of these feats were not previously achievable with other DNA-based or viral delivery technologies. Inovio's transformational approach could be applied to develop active monoclonal antibody products against multiple therapeutically important diseases including cancers as well as inflammatory and infectious diseases. Combined with favorable pharmacokinetic characteristics and cost structure compared to conventional monoclonal antibody technology, Inovio's active in-body generation of functional monoclonal antibodies in humans has the potential to significantly expand the range of targetable diseases.

Monoclonal antibodies as a product class have become one of the most valuable therapeutic technologies of recent years. In 2012, global sales value of monoclonal antibodies exceeded \$50 billion. Among the top 10 best-selling drugs in 2012, six of them were monoclonal antibodies, each with annual sales exceeding \$5 billion.

About Inovio Pharmaceuticals, Inc.

Inovio is taking immunotherapy to the next level in the fight against cancer and infectious diseases. They 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, Roche, The Wistar Institute,

University of Pennsylvania, DARPA, GeneOne Life Science, Plumblin Life Sciences, Drexel University, NIH, HIV Vaccines Trial Network, National Cancer Institute, U.S. Military HIV Research Program, and University of Manitoba.

For more information, visit www.inovio.com

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