



## NEWS RELEASE

# Inovio Pharmaceuticals' Published Universal Flu Vaccine Data Demonstrates Protective Responses Against All Major, Lethal H1N1 Influenza Viruses From the Last 100 Years in Animal Models

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PLYMOUTH MEETING, Pa., Jan. 22, 2018 (GLOBE NEWSWIRE) -- Inovio Pharmaceuticals, Inc. (NASDAQ:INO) today announced that Inovio's synthetic vaccine approach using a collection of synthetic DNA antigens generated broad protective antibody responses against all major deadly strains of H1 influenza viruses from the last 100 years including the virus that caused "Spanish Flu" in 1918 in multiple animal models including mice, guinea pigs and non-human primates.

The flu vaccine also affords 100% protection against lethal challenge in the gold standard ferret model, demonstrating the functionality of such broad protective immune responses. Preclinical flu vaccine study results were detailed in a paper published in the journal *Vaccine* entitled, "Broad cross-protective anti-hemagglutination responses elicited by influenza microconsensus DNA vaccine," by Inovio scientists and its collaborators.

A broadly protective flu vaccine would be of great value given how rapidly a pandemic strain could emerge. According to a recent editorial in *Science Magazine*: "....influenza viruses are moving targets, and a pandemic virus could nevertheless emerge with as little warning in 2018 as in 1918. As evidenced by this current flu season, influenza viruses can rapidly acquire mutations that evade our most recent vaccine formulations. A universal, broadly protective influenza vaccine for seasonal epidemics – a goal of intense research efforts -- would improve our preparedness for subsequent pandemics."

Dr. Laurent Humeau, Inovio's Sr. VP, Research and Development, said, "Funded by a grant from the NIH, this published work demonstrates that Inovio's ASPIRE™ (Antigen SPecific Immune RESponses) technology platform could produce a universal flu vaccine that can span seasonal vaccine changes allowing for continued immune protection. We are proud to advance Inovio technology and contribute to advance cutting edge technology for the important global health treats. These studies also showcase the latest CELLECTRA® intradermal (skin) delivery system to facilitate optimal antigen production and generation of superior immune responses in animal models."

Globally influenza remains an important pathogen contributing to significant deaths and illness each year. The CDC estimates that 56,000 Americans died from influenza-associated deaths in the United States during 2012-2013 flu season. Even with the seasonal flu vaccines generating \$3.8 billion in global revenue (WHO estimate), the currently approved seasonal influenza vaccines provide protection against only the three or four strains included in their specific formulations and are therefore incapable of addressing the inevitable and frequent shift and drift of influenza viral strains that can occur from season to season. Scientists have long been searching for an influenza vaccine designed to be broadly protective against multiple, unmatched influenza virus strains.

In this published study, Inovio report on a synthetic micro-consensus approach that relies on a small collection of 4 synthetic H1HA DNA antigens which delivered in a single dose generated broadly protective antibody immune responses against several major deadly strains of H1N1 flu viruses from the last 100 years including the strain that caused the 1918 Spanish Flu (which killed over 40 million people) in mice, guinea pigs and non-human primates. The vaccine also protected 100% of immunized ferrets from a lethal virus challenge. These results are encouraging that a limited easy-to-formulate collection of micro-consensus antigens can be developed which can span seasonal vaccine changes allowing for continued immune protection. All of these protective immune responses were generated using Inovio's skin delivery system for vaccines. Perhaps most importantly, this novel strategy could also be used to develop broadly protective vaccines against other infectious agents like dengue, RSV and HIV.

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. Furthermore, the ASPIRE™ technology generates potent antibody immunity as well allowing for all arms of the immune system to engage pathogens as well as to attack cancers. 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, Plumblinc 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](http://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, 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 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 September 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. Forward-looking statements speak only as of the date of this release, and Inovio undertakes no obligation to update or revise these statements, except as may be required by law.

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