

INOVIO Announces Publication of Phase 1 Data from its COVID-19 DNA Vaccine Candidate, INO-4800 in The Lancet's EClinicalMedicine

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Peer-reviewed Phase 1 data shows INO-4800 to be immunogenic in 100% of subjects, inducing neutralizing antibody and/or T cell responses

INO-4800 demonstrates favorable safety and tolerability, with no serious adverse events reported

Offers best-in-class thermostability, including a five-year projected shelf life at normal refrigeration temperature and no frozen transport or storage requirements

PLYMOUTH MEETING, Pa., Dec. 24, 2020 /PRNewswire/ -- INOVIO (NASDAQ:INO), a biotechnology company focused on bringing to market precisely designed DNA medicines to treat and protect people from infectious diseases and cancer, today announced the publication of peer-reviewed Phase 1 clinical data from the first cohort of 40 participants for its COVID-19 DNA vaccine candidate, INO-4800, in EClinicalMedicine, an open access clinical journal published by The Lancet.

The paper, titled "Safety and immunogenicity of INO-4800 DNA vaccine against SARS-CoV-2: a preliminary report of an open-label, Phase 1 clinical trial," found that INO-4800 was immunogenic in all vaccinated subjects, effectively generating an immune response of humoral (including neutralizing antibodies) and/or cellular responses (both CD4 and CD8 T cells).

Additionally, Phase 1 clinical data found INO-4800 to have a favorable safety and tolerability profile with no serious adverse events reported; only six Grade 1 adverse events (AEs) were observed, primarily minor injection site reactions. Notably, these only occurred on the day of the first or second dosing, and the AEs did not increase in frequency with the second administration.

INO-4800, beyond being safe and tolerable, is stable at room temperature for more than a year, at 37°C (98.6°F) for more than a month, has a five-year projected shelf life at normal refrigeration temperature [i.e., at 2-8°C / 35.6 – 46.4°F] and does not need to be frozen during transport or storage – all critical factors for timely global

distribution in the fight against COVID-19.

Dr. J. Joseph Kim, President and CEO of INOVIO, said, "We are very pleased to share peer-reviewed Phase 1 clinical data for INO-4800 published in The Lancet's EClinicalMedicine, and are grateful for the support of all participants and investigator staff involved in the clinical trial."

Dr. Stanley Plotkin, Professor Emeritus at The Wistar Institute, said, "INOVIO's DNA vaccine appeared to be quite safe with few significant reactions but yet induced both antibody and T cell responses to SARS-CoV-2."

Findings from the Phase 1 Clinical Trial

- The Phase 1 clinical trial of INO-4800 initially enrolled 40 healthy adult volunteers, ages 18 to 50, at two U.S. sites with funding from the Coalition for Epidemic Preparedness Innovations (CEPI).
- The participants were enrolled into 1.0 mg and 2.0 mg dose cohorts; each participant received two doses of INO-4800 four weeks apart. Each dose was administered by intradermal injection using INOVIO's proprietary smart device CELLECTRA®.
- Thirty-nine subjects completed both doses. One subject in the 2.0 mg group discontinued trial participation prior to receiving the second dose due to lack of transportation to the clinical site; discontinuation was unrelated to the study or the dosing. One subject was deemed to be seropositive at trial entry.
- The 1.0 mg and 2.0 mg dose group both demonstrated seroconversion in 95% of the subjects, respectively, with 78% demonstrating neutralizing antibodies in the 1.0 mg dose group and 84% demonstrating neutralizing antibodies in the 2.0 mg dose group.
- Cellular (T cell) response were observed to multiple regions of the spike protein including the RBD region. 74% had measurable cellular responses at the 1.0 mg dose group and 100% of the subjects in the 2.0 mg dose group demonstrated cellular responses.
- Through week 8, no serious adverse events were reported. Only 6 related Grade 1 adverse events in 5 subjects were observed, primarily mild injection site reactions (e.g., redness); none of these increased in frequency with the second administration.
- All 38 subjects who were evaluable for immunogenicity had balanced cellular and humoral immune responses following the second dose of INO-4800.
- **ClinicalTrials.gov** identifier: NCT04336410.

INOVIO is currently conducting the Phase 2 segment of its planned Phase 2/3 clinical trial for INO-4800, called INNOVATE (INOVIO INO-4800 Vaccine Trial for Efficacy). INNOVATE is a randomized, blinded, placebo-controlled safety and efficacy trial of INO-4800 to be conducted in adults in the U.S. It will be funded by the U.S. Department of Defense (DoD) Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO-CBRND) in coordination with the Office of the Assistant Secretary of Defense for Health Affairs (OASD(HA)) and the

Defense Health Agency (DHA).

The DoD has agreed to provide funding for both the Phase 2 and Phase 3 segments of the INNOVATE clinical trial, in addition to the \$71 million of funding previously announced in June 2020 for the large-scale manufacture of the company's proprietary smart device CELLECTRA® 3PSP and the procurement of CELLECTRA® 2000 devices.

INOVIO also recently **announced** the first dosing of its first subject in its Phase 2 clinical trial for INO-4800 in China, in collaboration with Advaccine. The company is currently in Phase 1/2a trials for INO-4800 in South Korea in partnership with The International Vaccine Institute and the Korea National Institute for Health.

About the INO-4800 "INNOVATE" Phase 2/3 Clinical Trial

The lead Principal Investigator for the INNOVATE trial is Dr. Pablo Tebas, Professor of Medicine at the Hospital of the University of Pennsylvania. The Phase 2 segment of the clinical trial is designed to evaluate safety, tolerability and immunogenicity of INO-4800 in a 2-dose regimen (1.0 mg or 2.0 mg), in a three-to-one randomization to receive either INO-4800 or placebo for each dose, to confirm the more appropriate dose(s) for each of three age groups (18-50 years, 51-64 years and 65 years and older) for the subsequent Phase 3 efficacy evaluation. The company intends to work diligently to ensure diversity in enrollment, targeting specific populations that are working or residing in environments with high infection rates and/or areas where there is greater risk of exposure to SARS-CoV-2, for whom exposure may be relatively prolonged or for whom personal protective equipment (PPE) may be inconsistently used, especially in confined settings.

In the Phase 3 segment of the clinical trial, INOVIO intends to enroll healthy men and non-pregnant women 18 years and older, to evaluate the efficacy of the proposed dose(s) based on the data from the Phase 2 evaluation. Participants will be enrolled in a one-to-one randomization to receive either INO-4800 or a placebo. The Phase 3 segment will be case-driven with the final number of enrollees to be determined by the incidence of COVID-19 during the Phase 3 segment. The primary endpoint of the Phase 3 segment will be virologically confirmed COVID-19 disease.

About INOVIO's Global Coalition Advancing INO-4800

INOVIO has assembled a global coalition of collaborators, partners and funders to rapidly advance the development of INO-4800. R&D collaborators to date include The Wistar Institute, the University of Pennsylvania, the University of Texas, Fudan University and Laval University. INOVIO has partnered with Advaccine and the International Vaccine Institute to conduct clinical trials of INO-4800 in China and South Korea, respectively. INOVIO is also assessing nonclinical efficacy of INO-4800 in several animal challenge models with Public Health England (PHE) and Commonwealth Scientific and Industrial Research Organization (CSIRO) in Australia. INOVIO is working

with a team of contract manufacturers including Kaneka Eurogentec, Thermo Fisher Scientific, Richter-Helm BioLogics, and Ology Bioservices to manufacture INO-4800 on a commercial scale and is seeking additional external funding and partnerships to further scale up manufacturing capacities to satisfy the urgent global demand for safe and effective vaccines. To date, the Coalition for Epidemic Preparedness Innovations (CEPI), the Bill & Melinda Gates Foundation, and the U.S. Department of Defense have contributed significant funding to the advancement and manufacturing of INO-4800.

About INO-4800

INO-4800 is INOVIO's DNA vaccine candidate against SARS-CoV-2, the novel coronavirus that causes COVID-19. INOVIO has extensive experience working with coronaviruses and was the first company to initiate a Phase 2a trial for INO-4700, a DNA vaccine candidate for a related coronavirus that causes Middle East Respiratory Syndrome (MERS).

Composed of an optimized DNA plasmid, INO-4800 is delivered directly into cells in the body via a proprietary smart device to produce a robust, safe and tolerable immune response. INO-4800 is the only nucleic-acid based vaccine that is stable at room temperature for more than a year, at 37o C for more than a month, has a five-year projected shelf life and does not need to be frozen in transport or storage, which are important factors when implementing mass immunizations.

About INOVIO's DNA Medicines Platform

INOVIO has 15 DNA medicine clinical programs currently in development focused on HPV-associated diseases, cancer, and infectious diseases, including coronaviruses associated with MERS and COVID-19, being developed under grants from the Coalition for Epidemic Preparedness Innovations (CEPI) and the U.S. Department of Defense. DNA medicines are composed of optimized DNA plasmids, which are small circles of double-stranded DNA that are synthesized or reorganized by a computer sequencing technology and designed to produce a specific immune response in the body.

INOVIO's DNA medicines deliver optimized plasmids directly into cells intramuscularly or intradermally using INOVIO's proprietary hand-held smart device called CELLECTRA®. The CELLECTRA® device uses a brief electrical pulse to reversibly open small pores in the cell to allow the plasmids to enter, overcoming a key limitation of other DNA and other nucleic acid approaches, such as mRNA. Once inside the cell, the DNA plasmids enable the cell to produce the targeted antigen. The antigen is processed naturally in the cell and triggers the desired T cell and antibody-mediated immune responses. Administration with the CELLECTRA® device ensures that the DNA medicine is efficiently delivered directly into the body's cells, where it can go to work to drive an immune response. INOVIO's DNA medicines do not interfere with or change in any way an individual's own DNA. The advantages of

INOVIO's DNA medicine platform are how fast DNA medicines can be designed and manufactured; the stability of the products, which do not require freezing in storage and transport; and the robust immune response, safety profile, and tolerability that have been observed in clinical trials.

With more than 2,000 patients receiving INOVIO investigational DNA medicines in more than 7,000 applications across a range of clinical trials, INOVIO has a strong track record of rapidly generating DNA medicine candidates with potential to meet urgent global health needs.

About INOVIO

INOVIO is a biotechnology company focused on rapidly bringing to market precisely designed DNA medicines to treat and protect people from infectious diseases, cancer, and diseases associated with HPV. INOVIO is the first and only company to have clinically demonstrated that a DNA medicine can be delivered directly into cells in the body via a proprietary smart device to produce a robust and tolerable immune response. Specifically, INOVIO's lead candidate VGX-3100, currently in Phase 3 trials for precancerous cervical dysplasia, destroyed and cleared high-risk HPV 16 and 18 in a Phase 2b clinical trial. High-risk HPV is responsible for 70% of cervical cancer, 91% of anal cancer, and 69% of vulvar cancer. Also in development are programs targeting HPV-related cancers and a rare HPV-related disease, recurrent respiratory papillomatosis (RRP); non-HPV-related cancers glioblastoma multiforme (GBM) and prostate cancer; as well as externally funded infectious disease DNA vaccine development programs in Zika, Lassa fever, Ebola, HIV, and coronaviruses associated with MERS and COVID-19 diseases. Partners and collaborators include Advaccine, ApolloBio Corporation, AstraZeneca, The Bill & Melinda Gates Foundation, Coalition for Epidemic Preparedness Innovations (CEPI), Defense Advanced Research Projects Agency (DARPA)/Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO-CBRND)/Department of Defense (DoD), HIV Vaccines Trial Network, International Vaccine Institute (IVI), Kaneka Eurogentec, Medical CBRN Defense Consortium (MCDC), National Cancer Institute, National Institutes of Health, National Institute of Allergy and Infectious Diseases, Ology Bioservices, the Parker Institute for Cancer Immunotherapy, Plumblin Life Sciences, Regeneron, Richter-Helm BioLogics, Thermo Fisher Scientific, University of Pennsylvania, Walter Reed Army Institute of Research, and The Wistar Institute. INOVIO also is a proud recipient of 2020 Women on Boards "W" designation recognizing companies with more than 20% women on their board of directors. For more information, visit www.inovio.com.

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This press release contains certain forward-looking statements relating to our business, including our plans to

develop and manufacture DNA medicines, our expectations regarding our research and development programs, including the conduct of the Phase 2/3 clinical trial of INO-4800, and our ability to successfully manufacture and produce large quantities of our product candidates if they receive regulatory approval. Actual events or results may differ from the expectations set forth herein as a result of a number of factors, including uncertainties inherent in preclinical studies, clinical trials, product development programs and commercialization activities and outcomes, our ability to secure sufficient manufacturing capacity to mass produce our product candidates, 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 medicines, our ability to support our pipeline of DNA medicine 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 us or our collaborators, including alternatives that may be more efficacious or cost effective than any therapy or treatment that we and our collaborators hope to develop, issues involving product liability, issues involving patents and whether they or licenses to them will provide us 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 we can finance or devote other significant resources that may be necessary to prosecute, protect or defend them, the level of corporate expenditures, assessments of our 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, 2019, our Quarterly Report on Form 10-Q for the quarter ended September 30, 2020 and other filings we make from time to time with the Securities and Exchange Commission. There can be no assurance that any product candidate in our pipeline will be successfully developed, manufactured or commercialized, that final results of clinical trials will be supportive of regulatory approvals required to market 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 we undertake no obligation to update or revise these statements, except as may be required by law.

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